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Comparison of the Reading Subtests of the Wechsler Individual Achievement Test - Third Edition and the Peabody Individual Achievement Test-Revised/Normative Update

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Comparison of the Reading Subtests of the Wechsler Individual Achievement Test -
Third Edition and the Peabody Individual Achievement Test-Revised/Normative Update

Thesis submitted to
the Graduate School of Education and
Professional Development

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

By

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Abstract

This study compared the reading subtests of the Wechsler Individual Achievement Test-Third Edition and the Peabody Individual Achievement Test-Revised/Normative Update. Scores were compared on these two tests in a group of 28 students ages 7 through 12 who were referred or reevaluated for suspected learning problems. The data were collected through a deidentified data set provided by a school building staff member or administrator and included such information as gender, age, and grade level as well as WIAT-III and PIAT-R/NU reading subtest scores. A t test of significance and the Pearson r Correlations were computed to see how the two scores covary. Implications of score variance are discussed.

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Chapter I: Literature Review

Achievement tests are used for a variety of purposes; however, one of the main uses of achievement tests within the educational setting has been to assess academic strengths and weaknesses as part of an educational evaluation. Evaluations are conducted to provide useful information and act as predictors of academic success as well as a tool to identify factors that may have an adverse effect upon a student's educational performance in the general education curriculum. According to the *Individuals with Disabilities Education Act 2004 (IDEA)*, evaluation teams must draw upon information from a variety of sources, including the results of achievement testing, when making a special education eligibility determination (U.S. Department of Education, 2010).

What is a Specific Learning Disability?

One of the methods used in the identification of a child with a suspected learning disability is the discrepancy model. The federal guidelines define a learning disability as "...a disorder in one or more of the basic psychological processes involved in understanding or using language, spoken or written, which disorder may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations..." (U.S. Department of Education, 2010).

The discrepancy model has been a cause for debate as new approaches or methods are adopted. This model consists of performing an ability-achievement discrepancy analysis using subtest and composite scores. Two primary methods for conducting an ability-achievement discrepancy analysis are the predicted achievement method and the simple difference method. The predicted achievement method consists of comparing a predicted ability score with the actual achievement scores whereas the simple difference

method compares the actual ability score and actual achievement scores. Both of these methods utilize critical values and base rates to determine statistically and clinically significant discrepancies (Beaux & Frances, 2010).

According to the reauthorized IDEA 2004, ‘when determining whether a child has a specific learning disability ... a local educational agency shall not be required to take into consideration whether a child has a severe discrepancy between achievement and intellectual ability’ ... a school ‘may use a process that determines if the child responds to scientific, research-based intervention as part of the evaluation procedures ...’ (Section 1414(b) (6)). However, some local educational agencies continue to use the discrepancy method when making determinations of special education eligibility as part of a multi-factor evaluation. Achievement testing is a critical part of both ability-achievement discrepancy analysis and measuring response to scientific, research based intervention methods as part of the evaluation process.

School psychologists have access to a variety of achievement tests that vary by subtest formats, length, and depth. The most common type of achievement test is norm-referenced and typically assesses skills in reading, written expression, and mathematics (Sattler, 2001). By knowing how the scores on different achievement tests differ, school psychologists can be better informed when deciding upon achievement test to administer in an evaluation process and when comparing current results with previous tests scores that were obtained from a different achievement test. For example, if a school psychologist administered an achievement test that typically scored lower on a subtest than another achievement test then this lower score could have an effect upon the determination decision.

The understanding of test score differences and their affects when using the discrepancy formula can also be applied to a response to an intervention-based approach. Achievement testing is used as a way to determine a student's areas of academic strengths and weaknesses. When more than one achievement test is used, knowledge of whether or not the scores are interchangeable or if the tests can be used to examine different aspects of reading for diagnostics purposes is important in the data-based decision process.

A 2008 study was conducted that compared the reading comprehension subtests of various tests to determine if the achievement batteries were measuring different skills. The tests that were included in this study the Gray Oral Reading Test (GORT), the two assessments (retellings and comprehension questions) from the Qualitative Reading Inventory (QRI), the Woodcock-Johnson Passage Comprehension subtest (WJPC), and the Reading Comprehension test from the Peabody Individual Achievement Test (PIAT). The correlation results indicated a low correlation between the GORT and QRI-Retell ($r = .31$), but a moderate correlation between PIAT ($r = .51$) and WJPC ($r = .54$). The QRI had a moderate correlation between the PIAT ($r = .45$) and WJPC ($r = .48$). Finally, the PIAT had a moderate to high correlation with the WJPC ($r = .70$), which was the highest correlation result. These modest correlations, except for the PIAT and the WJPC, suggest that the tests were not all measuring the same academic skills (Keenan, Betjamann, & Olso, 2008).

A 1980 study examined the Peabody Individual Achievement Test (PIAT) and Wide Range Achievement Test (WRAT). The sample consisted of 66 school-aged children who were participants in a regional treatment center for learning disabled

children. The children were administered the PIAT and WRAT when admitted to the program and again two years later. The correlations between the PIAT and WRAT shows the original testing indicated correlations of .90 for reading, .83 for spelling, and .83 for mathematics. The follow-up testing indicated correlations of .89 for reading, .83 for spelling, and .86 for mathematics, which were significant at the .01 level. The results indicate a high correlation between the PIAT and WRAT scores (Scull & Brand, 1980).

The reading subtests of the WJ-R, PIAT-R, K-TEA, and WRAT-R were examined in a 1991 study to provide information on the relationship and mean score differences between reading portions of these achievement batteries. The study included 118 elementary school students referred for a psychoeducational evaluation because of documentation of lack of academic progress. Results of the Pearson correlations between the reading subtests ranged from .78 to .98, showing a strong correlation among the tests. This study also found that the achievement tests did not yield similar scores when administered concurrently to the same student. This discrepancy was most notable with the K-TEA Reading decoding scores (mean= 80.55) and WRAT-R Reading standard scores (mean= 69.45), which is an 11.1 point difference. It is also of note that the PIAT-R and WRAT-R reading scores were generally significantly lower than the other achievement test reading scores (Prewett & Giannuli, 1991). This information is consistent with previous research that found significant correlations between the basic reading and reading comprehension subtests of different achievement batteries as well as dissimilarities between the reading subtest scores when the tests were administered to the same student.

Given the previous research that examined both the WIAT-II and PIAT-R/NU, it is important to continue examination of the newly updated version of the Wechsler Individual Achievement Test. The WIAT-III contains updated subtests as well as newly added subtests. With these new changes, it is important to reexamine if these tests measure the same reading skills and if there is a significant difference between the scores yielded by the tests.

Research Questions

1. Do the Reading Recognition subtest of the Peabody Individual Achievement Test-Revised/Normative Update (PIAT-R/NU) and the Word Reading subtest scores of the Wechsler Individual Achievement Test-Third Edition (WIAT-III) yield similar results when administered to the same students? This question will be answered by using a t-test.
2. Is there a significant correlation between the PIAT-R/NU Reading Recognition and the WIAT-III Word Reading subtest? This question will be answered by using a Pearson Correlation Coefficient.
3. Do the Reading Comprehension subtest scores of the Peabody Individual Achievement Test-Revised/Normative Update (PIAT-R/NU) and the Reading Comprehension subtest score of the Wechsler Individual Achievement Test-Third Edition (WIAT-III) yield similar results when administered to the same students? This question will be answered by using a t-test.

4. Is there a significant correlation between the PIAT-R/NU Reading Comprehension and the WIAT-III Reading Comprehension subtest? This question will be answered by using a Pearson Correlation Coefficient.
5. Do the Total Reading Composite scores of the Peabody Individual Achievement Test-Revised/Normative Update (PIAT-R/NU) and the Total Reading Composite Score of the Wechsler Individual Achievement Test-Third Edition (WIAT-III) yield similar results when administered to the same students? This question will be answered by using a t-test.
6. Is there a significant correlation between the PIAT-R/NU Total Reading Composite score and the WIAT-III Total Reading Composite score? This question will be answered by using a Pearson Correlation Coefficient.

Hypotheses

1. There is a significant difference between the scores obtained on the Reading Recognition subtest of the PIAT-R/NU and the Word Reading Subtest of the WIAT-III.
2. The scores on the Reading Recognition subtest of the PIAT-R/NU and the Word Reading subtest of the WIAT-III are significantly correlated.
3. There is a significant difference between the scores obtained on the Reading Comprehension subtest of the PIAT-R/NU and the Reading Comprehension Subtest of the WIAT-III.

4. The scores on the Reading Comprehension subtest of the PIAT-R/NU and the Reading Comprehension subtest of the WIAT-III are significantly correlated.
5. There is a significant difference between the scores obtained on the Total Reading Composite of the PIAT-R/NU and the Total Reading Composite of the WIAT-III.
6. The scores on the Total Reading Composite of the PIAT-R/NU and the Total Reading Composite of the WIAT-III are significantly correlated.

Chapter II: Method

Need for Study

The purpose of this study was to provide information on the mean score differences of the tests as well as to determine if there is a significant relationship between scores obtained from the Wechsler Individual Achievement Test-Third Edition and the Peabody Individual Achievement Test-Revised/Normative Update when the tests are administered to the same student.

Due to the fact that the discrepancy model and response to research based interventions continue to be used by many local educational agencies, it is important to determine if subtests are comparable for both initial and reevaluation purposes. For instance, a student may have an elevated score on the Reading Comprehension score when administered the WIAT-III but not on the PIAT-R/NU. The elevated score would have a significant effect upon determination of a specific learning disability.

Subjects

Data were collected from two elementary schools within the public school setting. The PIAT-R/NU and the WIAT-III were administered to 28 students during the 2009-2010 school year for the purpose of an initial evaluation or reevaluation to determine eligibility for special education and related services. The students attended one of two moderate size rural public elementary schools in Ohio. The sample consisted of white males and females between the ages of 7 and 12.

Table 1

Ages and Gender of Students

Gender	<u>n</u>	Age (Mean)	S.D.
Males	14	9.4	1.6
Females	14	9.3	1.6
Total	28	9.3	1.6

Instruments

Wechsler Individual Achievement Test-Third Edition

The Wechsler Individual Achievement Test-Third Edition (WIAT-III) is an individually administered, comprehensive, clinical instrument for assessing the achievement with updated norms for Pre-K through grade 12, and for ages 4:0-19:11. Adult norms, which include ages 20-50 years, will be available mid 2010 (Breux, 2009).

The Wechsler Individual Achievement Test-Third Edition is an expanded version of the Wechsler Individual Achievement Test-Second Edition. The changes to the enhanced version include three new subtests: Oral Reading, Math Fluency and Early

Reading Skills. Besides the addition of new subtests, other existing subtests have been enhanced: Written Expression, Reading Comprehension, Oral Expression, and Listening Comprehension portions. The new subtests and enhancements encompass all eight areas of achievement that are identified by IDEA legislation as eligibility criteria for classifying learning disabilities as well as a model that provides clinicians with a way to identify processing strengths and weaknesses with comparison to weak areas of achievement.

Breaux provides explanations of revisions and changes to the reading subtests. The WIAT-III consists of five reading subtests. A new subtest, Early Reading Skills, is a measure of prereading and early reading skills that includes phonological awareness and knowledge of phonological-orthographic relationships. Some of these skills were previously assessed within the Word Reading subtest on the WIAT-II; however, it is now a separate measure (Breaux, 2009). For the purposes of this study, Early Reading Skills were not assessed due to the age and grade level range of the subjects included in this study.

The Word Reading subtest was a subtest previously included on the WIAT-II but updated to include a new word list and items that allow for a more in-depth skill analysis. In addition, a word reading speed factor was added to the subtest, but accuracy of word reading is still the most significant part of the subtest (Breaux, 2009).

Similarly, the Pseudoword Decoding subtest was also preserved from the previous WIAT-II. This subtest measures a student's ability to pronounce non-words or pseudowords, which is an examination of "phonological recoding" or decoding skills. This subtest also now includes a pseudoword decoding speed measure (Breaux, 2009).

The Reading Comprehension subtest was kept as a measure of literal and inferential reading comprehension skills. Updates to the Reading Comprehension passages include new colorful artwork, enhanced reading passages, and updated skill analysis. Additional changes were made by a removal of the reading rate and target words portion that were included in the Second Edition.

Due to the fact that the reading rate and target words in the context of the sentence were removed from the Reading Comprehension subtest, the Oral Reading Fluency subtest was added to the WIAT-III. The Oral Reading Fluency subtest is a measure of fluency, which is the ability to read quickly, accurately, and with comprehension. These factors as well as reading behaviors are included in the analysis of the Oral Reading Fluency subtest.

The Total Reading Composite score is a combination of Early Reading Skills, Word Reading, Pseudoword Decoding, Reading Comprehension, and Oral Reading Fluency. It is of note that due to age and grade level some of these subtests may or may not be included in a Total Reading Composite score.

Peabody Individual Achievement Test-Revised/Normative Update

The Peabody Individual Achievement Test-Revised/Normative Update is an individually administered norm-referenced measure of academic achievement that is designed to be administered to students in kindergarten through grade 12 and ages 5-0 through 18-11 years. The PIAT-R/NU was updated in 1995-1996 with new standardization data; however, no changes were made to the content of the test. This normative update was based on a national sampling of 3,429 school children and young adults that included both females and males. It was also conormed with other

achievement batteries (Johnson, 1999). This achievement test includes six areas of academic assessment: General Information, Reading Recognition, Reading Comprehension, Mathematics, Spelling, and Written Expression. It is of note that the normative data did not include students who were not proficient in English, so this particular assessment would not be appropriate for use with English Second Language learners (Markwardt, 1997).

The Reading Recognition subtest is designed to measure phonological processing and reading decoding skills. It is comprised of 100 isolated unrelated words that increase in difficulty that are used to measure recognition of printed letters and the ability to read words aloud from a list.

The Reading Comprehension subtest is a measure of a student's ability to comprehend or understand what is read. On this particular subtest, students are presented with a sentence and then asked to pick from a series of four pictures that best illustrates the context of the sentence on the following page. This test is a multiple choice format that is often ideal for students with limited expressive abilities (Markwardt, 1997). It is of note that due to the multiple choice format of the Reading Comprehension subtest, it could be possible that it is just as much as measure of memory as it is reading comprehension (Sattler, 2001). The Total Reading score is a combination of Reading Recognition and Reading Comprehension subtests.

Procedures

The sample size between groups varied depending on the availability of the subtest scores. For example, a kindergarten student would not have been administered the Reading Comprehension subtest of the WIAT-III, and even though the student might

have received a PIAT-R/NU Reading Comprehension score, this score was not used in the reading comprehension sample. A t test of significance for dependent groups was computed. Pearson Product Moment Correlations were used to test for significant relationships between the reading scores of the PIAT-R/NU and the WIAT-III. These statistics were calculated for the following subtests: PIAT-R/NU Reading Recognition and the WIAT-III Word Reading, PIAT-R/NU Reading Comprehension and WIAT-III Reading Comprehension, and PIAT-R/NU Total Reading Composite and WIAT-III Total Reading Composite.

Table 2

Subtests	<u>n</u>	Score (Mean)	S.D.
PIAT-R/NU Reading Recognition	28	93.9	10.8
PIAT-R/NU Reading Comprehension	26	94.6	12.4
PIAT-R/NU Total Reading	25	95.6	13.5
WIAT-III Word Reading	28	86.1	12.9
WIAT-III Reading Comprehension	26	88.4	10.9
WIAT-III Total Reading	25	87.1	13.8

Chapter III: Results

Hypothesis 1

There is a significant difference between the scores on the Word Reading subtest of the WIAT-III and the Word Recognition subtest of the PIAT-R/NU. The t test ($t=6.1$, $p < .05$) indicate that there is a significant difference between the scores obtained on the Word Reading subtest and the Reading Recognition subtest.

Hypothesis 2

The scores on the Word Reading subtest of the WIAT-III and the Reading Recognition subtest of the PIAT-R/NU are significantly correlated. The Pearson r correlation ($r= 0.8$, $p <.05$) indicate that there is a significant and high correlation between Word Reading and Reading Recognition subtest scores.

Hypothesis 3

There is a significant difference between the scores on the Reading Comprehension subtest of the WIAT-III and the Reading Comprehension subtest of the PIAT-R/NU. The t test ($t=3.2$, $p <.05$) indicate a significant difference between the scores on the Word Reading subtest and the Reading Recognition subtests.

Hypothesis 4

The scores on the Reading Comprehension subtest of the WIAT-III and the Reading Comprehension subtest of the PIAT-R/NU are significantly correlated. The Pearson r correlation ($r= 0.6$, $p <.05$) indicate that there is a significant correlation between the Reading Comprehension subtest scores.

Hypothesis 5

There is a significant difference between the Total Reading Composite scores of the WIAT-III and the Total Reading Composite score of the PIAT-R/NU. The t test ($t=4.6$, $p <.05$) indicates a significant difference between the scores on the Reading Composites.

Hypothesis 6

The scores on the Total Reading Composite scores of the WIAT-III and the Total Reading Composite scores of the PIAT-R/NU are correlated. The Pearson r correlation ($r=0.8$, $p <.05$) indicate that the scores on the subtests are significantly correlated.

Table 3*t- test for statistical significance between WIAT-III and PIAT-R/NU reading subtests*

Subtest	t-test	p-level
WIAT-III Word Reading	6.1	<.05
PIAT-R/NU Reading Recognition		
WIAT-III Reading Comprehension	3.2	<.05
PIAT-R/NU Reading Comprehension		
WIAT-III Total Reading	4.6	<.05
PIAT-R/NU Total Reading		

Table 4*Pearson Product Moment Correlation*

Subtest	r	p-level
WIAT-III Word Reading	0.8	<.05
PIAT-R/NU Reading Recognition		
WIAT-III Reading Comprehension	0.6	<.05
PIAT-R/NU Reading Comprehension		
WIAT-III Total Reading	0.8	<.05
PIAT-R/NU Total Reading		

Chapter III: Discussion

The results found that the reading subtests on the Wechsler Individual Achievement Test- Third Edition and the Peabody Individual Achievement Test-Revised/Normative Update were significantly correlated (see Table 4). The results also found that the WIAT-III reading subtests yielded significantly lower scores than the similar reading subtests on the PIAT-R/NU. These results help evaluators when deciding upon an achievement test for evaluation and reevaluation purposes as well as when using the tests for comparison purposes during reevaluations.

Although the subtests showed a moderate to strong relationship, the tests yielded dissimilar results when administered concurrently. The WIAT-III reading scores were generally significantly lower than the PIAT-R/NU reading scores. The most notable difference was between the WIAT-III and PIAT-R/NU Total Reading scores (8.4 points). It is of note that WIAT-III provides a more comprehensive examination of reading skills due to the fact that it is comprised of additional subtests that include Oral Reading Fluency, Early Reading Skills, and Pseudoword Decoding.

The 0.6 correlation between the two reading comprehension subtests suggests that the two tests are not measuring the same construct. Additional research is needed to examine how the format of the subtests affects what is being measured. That is, are the reading comprehension subtests of the WIAT-III and PIAT-R/NU measuring different skills? The PIAT-R/NU uses a pictorial multiple choice format that requires the student to pick the correct choice from memory of what was read. The WIAT-III, on the other hand, requires the student to answer orally to a question about the passage that was read while the passage remains in front of the student. Thus, it could be hypothesized that a

student with a relative deficit in working memory processes would score lower on the PIAT-R/NU as compared to the WIAT-III. A study that explores this hypothesis of a working memory component adversely affecting student performance in students with a relative deficit in working memory processes would be of interest.

In addition, the fact that the tests did not yield similar results when administered to the same students raises concern for psychoeducational decision making. For example, a student's reading subtest scores would be expected to be lower on the WIAT-III than on the PIAT-R/NU. The lower score would result in a larger ability/achievement discrepancy, thus enhancing the likelihood of meeting eligibility criteria in the category of Specific Learning Disability. Further, given the unexpectedly low correlation between the reading comprehension subtests, unpredictably large score differences between these two subtests would be expected to be a common occurrence. A correlation of 0.6 translates to a Standard Error of Measurement of 9 points (at the 68% confidence level). If the confidence level is set at 95%, then the standard error is 18 points. Hence, given a score on the PIAT-R/NU Reading Comprehension subtest, the predicted score that would be obtained if the WIAT-III Reading Comprehension subtest is administered would be the PIAT-R/NU score minus 8 points +/- 18 points. For example, if a student obtains a Reading Comprehension score of 90 on the PIAT-R/NU, the predicted WIAT-III Reading Comprehension score would fall in the range of 64 to 100. Clearly, the reading comprehension subtests on the two tests cannot be used interchangeably. The subtests do not measure the same skills, and the two subtests would also be expected to frequently yield highly discrepant scores.

Future Implications

With the addition of subtests to the WIAT-III, such as Oral Reading Fluency and Math Fluency, the WIAT-III could be useful as a screener in response to intervention schools. A study of curriculum-based measures of math and reading fluency could be undertaken to determine the usefulness of the WIAT-III for that purpose. Using only a portion of the WIAT-III for that purpose would be for screening purposes only (as is the case with curriculum-based measures) and should not be used as a sole basis for determination of special education eligibility.

Future research should be replicated with a larger and more diverse sample. Samples should also include an examination of specific populations such as learning disabled and cognitively delayed students. Because this study focused on elementary and intermediate-aged students, future studies could examine adolescent-aged students. In addition, more research is needed for comparison of the WIAT-III to other achievement tests such as the Woodcock Johnson Revised Test of Achievement or Kaufman Test of Educational Achievement-Comprehensive Form as well as additional subtests within these achievement tests in the areas of mathematics, and written expression.

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