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Normative Comparison for the Woodcock-Johnson III : Tests of Achievement in 15 & 18 Year Olds

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Normative Comparison for the Woodcock-Johnson III:

Tests of Achievement in 15 &18 year olds

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In partial fulfillment of
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by

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ABSTRACT

This study evaluates the use of the original and updated norms of the Woodcock Johnson-III in making educational decisions. The method of collection involved placing the raw score obtained from the updated norms into the original Compuscore program to see if there is a difference between the two scoring systems. The scores were then placed in a figure to see how much the scores varied from each other. Results of the study showed that there was a 1 to 3 point difference between specific skill areas, with some skill areas obtaining a 5 to 6 point difference. Suggestions are made for Practioners when using the updated norms.

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Chapter I Literature Review

The purpose of norming a test is to obtain data from a sample of subjects that can be used to compare and evaluate another person's performance. After the initial norming, tests are periodically renormed. Tests need to be renormed for several reasons. One reason is The Flynn Effect (Scott, Bengston, & Gao, 1998, p. 110), and another reason concerns demographic changes in the target population since the test was originally normed. When a test is renormed, it is useful to determine how scores derived using the new norms compare to scores derived from using the old norms.

The Flynn Effect is the term used to describe the increases in a population's performance on intelligence and achievement tests that have been consistently found to occur over time (Silverstein & Nelson, 2000). That is, students will score higher on a test that was normed in the 1960's than they will on a test that was recently normed. Because of this, tests need to be renormed in order to obtain a more accurate comparison of a student's performance on a test with the typical performance of other students his or her age.

Besides the Flynn Effect, tests also need to be renormed because of demographic changes. These changes include geographic shifts, increased urbanization, greater percentages of young children, and increases in minorities in the overall population (Riverside Publishing, 2006, p.1). These changes in demographics make norms that were developed using previous census data irrelevant for use with current students. That is, the old norms are no longer representative of the target population. The Flynn Effect and population changes provided the drive for Riverside Publishing to recalculate the norms using the U.S. 2005 Census Data.

When the statisticians at Riverside Publishing looked at the 2005 U.S. Census data they found significant demographic changes in the school aged population when compared with the

census data that was used for the original norming of the Woodcock-Johnson III. For instance, they found that that the population of interest had increased by 6.8 million due to migration (McGrew, Dailey, & Schrank, 2007, p. 3). They also found significant changes in age, gender, race, Hispanic origin, and place of residence. The latter was because some states grew at three times the national rate due to better job opportunities and climate preferences.

There are two ways an achievement test can be renormed. The first method involves readministering the test to a sample of students that reflect the current demographics of the country (Butcher, 2000, p. 265). The second method, which is the method Riverside Publishing used to renorm the Woodcock-Johnson III, departed from the common procedure of re-administering the test. Rather than re-administering the test to a new sample of students selected on the basis of new census data, Riverside Publishing re-analyzed, or reconfigured the original norm data using the U.S. 2005 Census data to provide the most current representation of the U.S. population (McGrew, Dailey, & Schrank, 2007, p. 3).

The Woodcock- Johnson III Tests of Achievement is a revised and expanded version the Woodcock -Johnson Revised and is an individually administered assessment of academic skills. It is designed for children, adolescents, and adults ranging from 2 through 90 years (Bradley-Johnson, 2004, p.1). Areas covered include Broad Reading, Broad Mathematics, and Broad Written Language. Results are reported as standard scores with a mean of 100 and a standard deviation of 15. Most children score between 85 and 115. There are easels for the test: a standard battery which contains subtests 1-11 and supplemental subtest 12 and an extended battery that contains tests 13-22. The extended battery is given to students to determine strength and weaknesses in specific academic areas. Scores obtained from the test are reported for age and grade based norms and is reported as percentiles.

The Woodcock-Johnson III is scored using a computer program called Compuscore. After placing the scores into the Compuscore and Profiles program, a diagnostic profile is obtained which is used to determine individual strengths and weaknesses in specific academic areas. This information is beneficial in developing educational programming; provide guidance, growth, and program evaluation (McGrew, Schrank & Woodcock, 2007, 6). Diagnostic profiles obtained using the current normative data may differ from the profiles obtained using the original norms because when a test is renormed the student's current performance is compared to a different reference group.

This study will compare scores obtained using the Woodcock-Johnson III Normative Update with scores, using the same raw scores, obtained using the original norms. This study is needed due to the lack of literature stating the effects of the Woodcock-Johnson III Normative Update on specific obtained scores. This study will compare achievement scores for 15 and 18 years old to see if the new norms yield different scores than the original norms. The questions that will be examined are as follow:

1. For 15 year olds, given the same raw scores, do scores based on the Normative Update differ from scores based on the original norms for Letter-Word Identification?

2. For 15 year olds, given the same raw scores, do scores based on the Normative Update differ from scores based on the original norms for Passage Comprehension?

3. For 15 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Reading Fluency

4. For 15 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Calculation?

5. For 15 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Math Fluency?

6. For 15 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Applied Problems?

7. For 18 year olds, given the same raw scores, do scores based on the Normative Update differ from scores based on the original norms for Letter-Word Identification?

8. For 18 year olds, given the same raw scores, do scores based on the Normative Update differ from scores based on the original norms for Passage Comprehension?

9. For 18 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Reading Fluency

10. For 18 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Calculation?

11. For 18 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Math Fluency?

12. For 18 year olds, given the same raw scores, do the scores based on the Normative Update differ from scores based on the original norms for Applied Problems?

Chapter II Method

The Woodcock Johnson III Tests of Achievement Normative Update is a recalculation of the normative data for the Woodcock-Johnson III based on the final 2000 U.S. census data. (Woodcock & McGrew 2001, p.1) It is designed for children, adolescents, and adults ranging from 2 through 90 years (Bradley-Johnson, 2004, p.1). Areas covered include Broad Reading, Broad Mathematics, and Broad Written Language. Results are reported as standard scores with a mean of 100 and a standard deviation of 15.

Procedure

Using the original Compuscore program, raw scores were entered to make the standard scores for each subtest as close to 70 as possible. Each raw score was be increased by 15 points until standard scores of 70, 85, 100, 115, and 130 were reached. Identical raw scores for each subtest will be entered into the scoring program using the 'new' norms. This procedure was used to obtain scores, derived from the original and the updated norms for each of the subtests on the standard battery of the WJ-III (form A) for 15 year olds and then for 18 year olds. The obtained standard scores for the subtests are graphed for each age group**.**

Subjects

This study did not use data collected from the administration of the Woodcock-Johnson III to real subjects.

Need for Study

Although the Riverside Report (McGrew, Schrank, & Woodcock, 2007) provided the Average or Median difference scores for the subtest between the new and old norms, the report does not provide information concerning score differences for different skill levels. For instance, is the difference between the scores derived from old and new norms greater at low skill levels?

(for instance, standard scores below 70) than for average or above average skill levels? My study addressed this question by directly comparing the standard scores derived from the original and new norms across skill levels (standard scores from 70 to 130) and addressed the question if the new norms affect test scores obtained by students who took the Woodcock-Johnson III.

Chapter III Results

Results for 15 year olds

Table 1 presents the score differences between the WJ-III updated norms and original norms. The two scoring systems yielded identical scores for the average range. The original norms yielded slightly higher scores for below average and above average scores obtained from the normative update.

Table 1

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Letter-Word Identification

Updated Norms	Original Norms	Difference*
70	74	-4
85	86	-1
100	100	0
115	118	-3
130	132	-2

*Updated norms minus original norms

Figure 1

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Letter-Word Identification
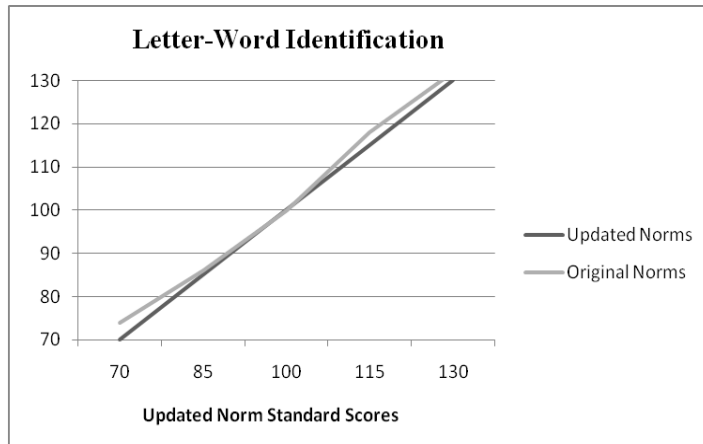

Table 2 shows the differences in WJ-III scores using the updated and original norms for Passage Comprehension. The two scoring systems differed by only one to 3 points with the original norms generally yielding the higher score.

Table 2

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Passage Comprehension

Updated Norms	Original Norms	Difference*
70	73	-3
85	87	-2
100	99	+1
115	116	-1
130	133	-3

*Updated norms minus original norms

Figure 2

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Passage Comprehension
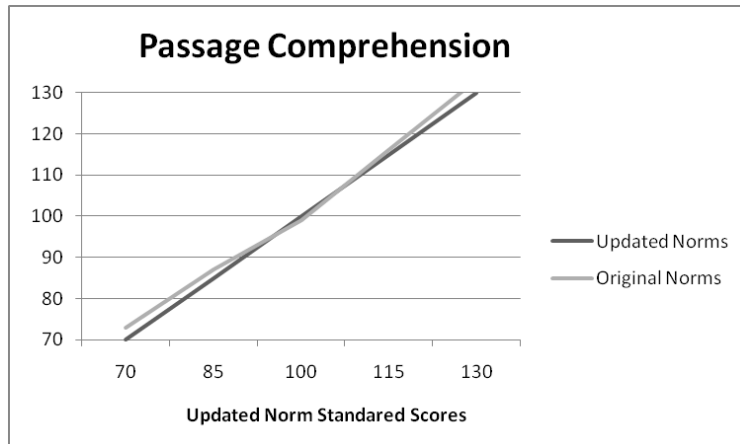

Table 3 shows the differences in WJ-III scores using the updated and original norms for Reading Fluency. The two scoring systems differed by only 2 to 6 points with the original norms generally yielding the higher score.

Table 3

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Passage Comprehension

Updated Norms	Original Norms	Difference*
70	72	-2
85	85	0
100	100	0
115	121	-6
130	130	0

*Updated norms minus original norms

Figure 3

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Reading Fluency
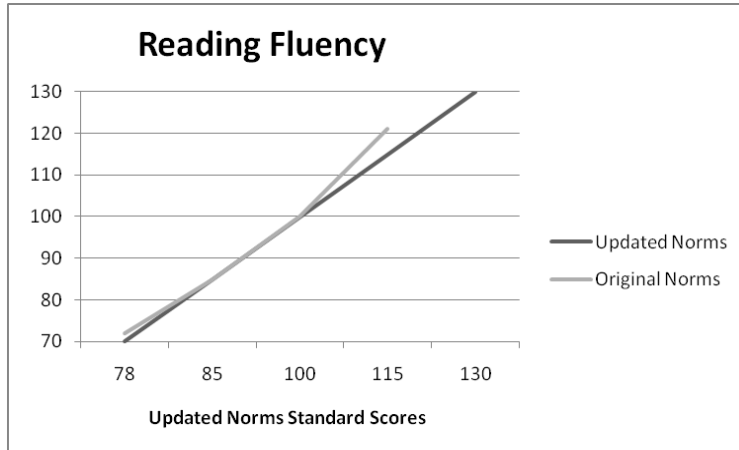

Table 4 shows the differences in WJ-III scores using the updated and original norms for Calculation. The two scoring systems differed by only 1 to 5 points with the original norms generally yielding the higher score.

Table 4

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Calculation

Updated Norms	Original Norms	Difference*
70	75	-5
85	84	+1
100	101	-1
115	115	0
130	131	-1

*Updated norms minus original norms

Figure 4

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Calculation
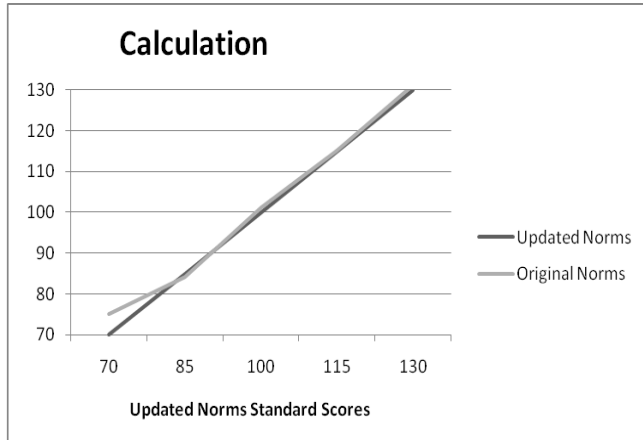

Table 5 shows the differences in WJ-III scores using the updated and original norms for Math Fluency. The two scoring systems differed by only 1 to 3 points with the updated norms generally yielding the higher score.

Table 5

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Math Fluency

Updated Norms	Original Norms	Difference*
70	69	+1
85	83	+2
100	99	+1
115	114	+1
130	127	+3

*Updated norms minus original norms

Figure 5

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Math Fluency
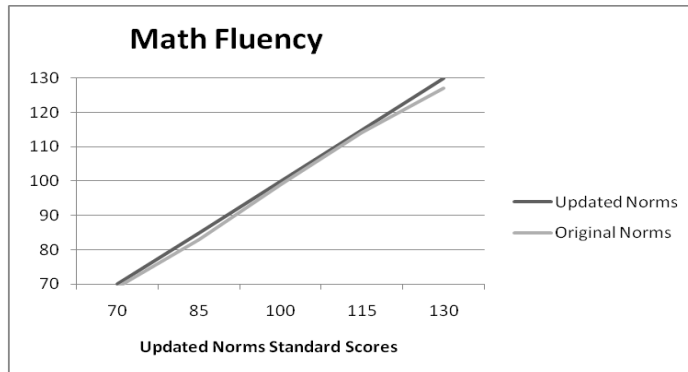

Table 6 shows the differences in WJ-III scores using the updated and original norms for Applied Problems. The two scoring systems differed by only 1 to 3 points with the updated norms generally yielding the higher score.
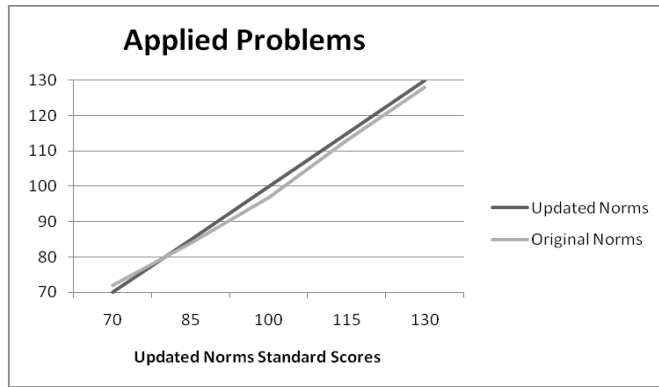
Table 6

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Applied Problems

Updated Norms	Original Norms	Difference*
70	72	-2
85	84	+1
100	97	+3
115	113	+2
130	128	+2

*Updated norms minus original norms

Figure 6

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 15 for Applied Problems

Results for 18 year olds

Table 7 presents the score differences between the WJ-III updated norms and original norms. The two scoring systems yielded identical scores for the average range. The original norms yielded slightly higher scores for below average above average scores obtained from the normative update.

Table 7

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Letter-Word Identification

Updated Norms	Original Norms	Difference
70	69	+1
85	84	+1
100	100	0
105	105	0
115	115	0
125	126	+1

Figure 7

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Letter-Word Identification
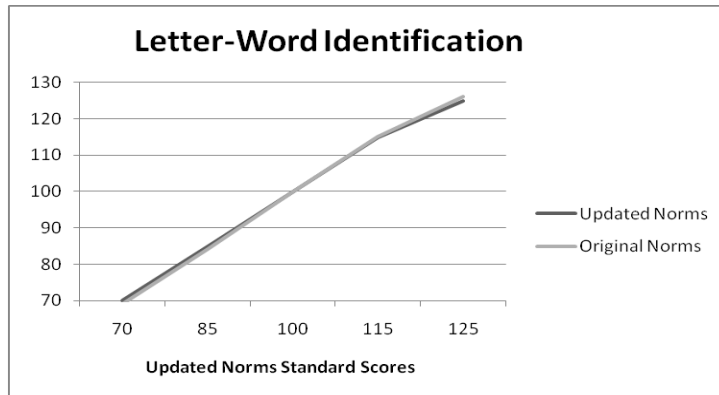

Table 8 shows the differences in WJ-III scores using the updated and original norms for Passage Comprehension. The two scoring systems differed by only 1 to 5 points with the Original norms generally yielding the higher score.

Table 8

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Passage Comprehension

Updated Norms	Original Norms	Difference*
70	71	-1
85	86	-1
100	98	+2
115	114	+1
130	135	-5

*Updated norms minus original norms

Figure 8

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Passage Comprehension
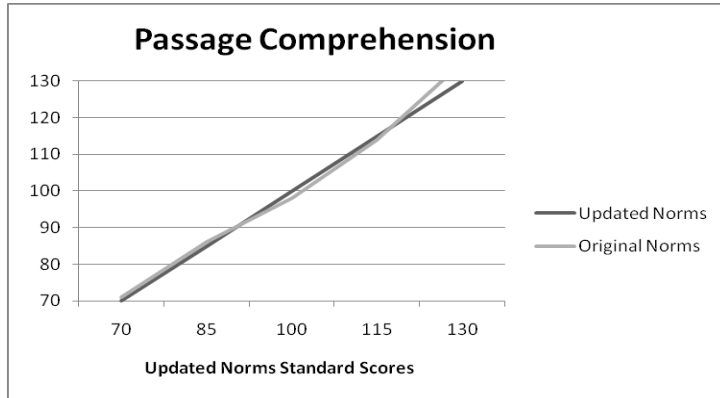

Table 9 shows the differences in WJ-III scores using the updated and original norms for Reading Fluency. The two scoring systems differed by only 1 to 3 points with the original norms generally yielding the higher score.

Table 9

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Reading Fluency

Updated Norms	Original Norms	Difference*
70	71	-1
85	83	+2
100	97	+3
115	118	+3
120	122	-2

*Updated norms minus original norms

Figure 9

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Passage Comprehension
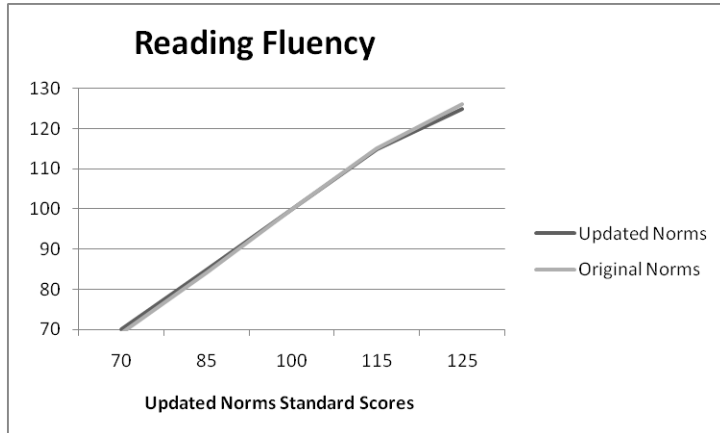
Reading Fluency

Table 10 shows the differences in WJ-III scores using the updated and original norms for Calculation. The two scoring systems differed by only 3 to 5 points with the updated norms generally yielding the higher score.

Table 10

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Calculation

Updated Norms	Original Norms	Difference*
70	66	+4
85	80	+5
100	97	+3
115	112	+3
130	130	0

*Updated norms minus original norms

Figure 10

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Calculation
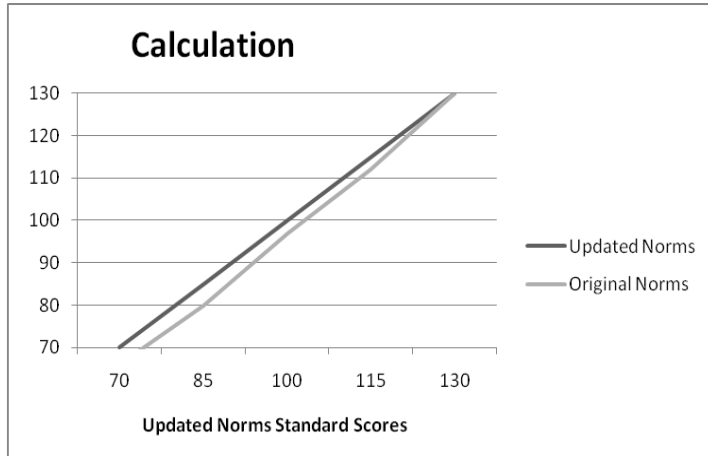

Table 11 shows the differences in WJ-III scores using the updated and original norms for Math Fluency. The two scoring systems differed by only 2 to 3 points with the updated norms generally yielding the higher score.

Table 11

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Math Fluency

Updated Norms	Original Norms	Difference*
70	72	-2
85	85	0
100	98	+2
115	113	+3
120	118	+2

*Updated norms minus original norms

Figure 11

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for
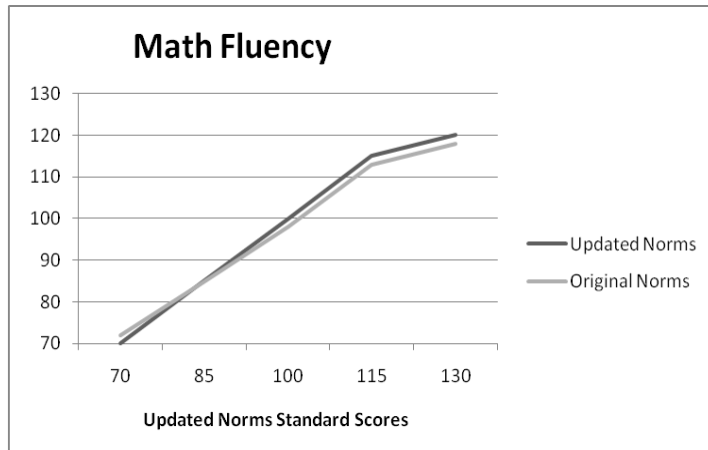Math Fluency

Table 12 shows the differences in WJ-III scores using the updated and original norms for
Applied Problems. The two scoring systems differed by only 1 to 3 points with the original
norms generally yielding the higher score.

Table 12

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for
Applied Problems

Updated Norms	Original Norms	Difference*
70	71	-1
85	84	+1
100	97	+3
115	114	+1
130	133	-3

*Updated norms minus original norms

Figure 12

Comparison of WJ-III Achievement Scores using Updated and Original Norms for Age 18 for Applied Problems
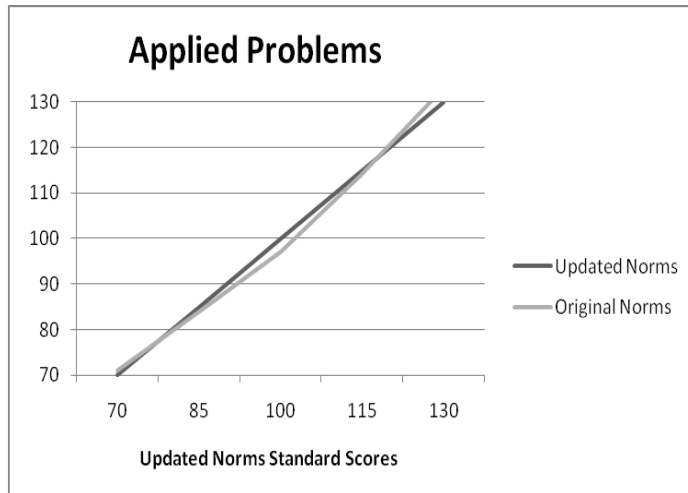
Chapter IV Discussion

In general, the scores based on the updated and original norms did not differ by more than 1 to 3 points. The two scoring systems generally gave very similar scores. Interestingly, the original norms did not always yield higher scores than the updated norms as would be expected given the Flynn Effect. For example, the updated norms yielded higher scores for Math Fluency and Applied Problem for 15 year olds and the majority of subtests for 18 year olds. For 15 year olds, the Passage Comprehension and Calculation subtests, differed by five points, (original norms yielding the higher score) for specific skill levels (see Tables 3 and 4). This difference was also observed in the same subtests for 18 year olds (see Tables 8 and 10). A difference of five points or more is a third of a standard deviation and this may lead to a different interpretation of a student's skills in the measured areas.

The results of these comparisons indicate that scores based on the updated norms are comparable to the scores based on the original norms. Therefore, practitioners can compare assessment results based on the updated norms with previous test results that used the original norms. A significant change in scores between test sessions with the WJ-III can be interpreted as

a relative change in skill levels and not as a result in the differences in norm table. The exceptions for this conclusion involve the specific instances where the two scoring methods yielded scores that differed by 5 to 6 points (see above). In these instances, Practioners should take these differences into account when comparing current test scores using the updated norms with previous WJ-III scores that used the original norms.

This study is limited to 15 and 18 year olds and cannot be generalized to other age groups. This study only examined the math and reading subtests on the basic battery and did not include subtests from the extended battery. The study also did not include subtests from the Cognitive Battery. Because the extended battery and the Cognitive Battery were not included, Cluster scores could not be examined, nor could the effect of the new norms on ability/achievement discrepancy scores be determined

Future Research

Future research could examine the score differences using the updated and original norms by looking at the extended battery and cognitive battery to obtain cluster scores and ability/achievement discrepancy scores. Research could also examine specific subtests for certain age groups. It is important to know how important these updated norms are when making educational determinations in children's schooling.

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