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Normative Comparison for the Woodcock-Johnson III: Tests of Achievement for 1, 3, 6, 9, & 12 Grades

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ABSTRACT

This study examines the use of the updated and original norms of the Woodcock Johnson-III (WJ-III), Tests of Achievement in making educational decisions. The method used to collect data included placing into the original Compuscore program, raw scores acquired from the updated norms to determine if a difference between the two scoring programs is evident. This procedure was used to obtain scores derived from the original and the updated norms for each Math subtest on the standard battery of the WJ-III (form A) for grades 1, 3, 6, 9, and 12. Results of the study showed the two scoring systems yielded scores that were generally very similar with scores based on the updated and original not differing by more than 1 to 3 points. However there were a few exceptions, with a significant difference between original and updated norms by 8 to 12 points. This study includes suggestions for Practitioners when using the updated norms.

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Chapter I Literature Review

Tests are renormed in order to attain data from a sample of subjects that can then be used as a comparison in evaluating a different subject‟s performance. Changes in the target population‟s demographics and the Flynn Effect, which refers to the steady rise of intelligent quotient scores (Resing & Tunteler, 2007), are reasons that tests need to be renormed. In addition, concerning mental retardation diagnosis, the Yo-Yo Effect can be a factor. For example, mental retardation rates among children appear to bottom out near the end of a particular test's run, followed by a sharp rebound when a more difficult test is introduced. (Bower, 2003) Therefore, after a test is renormed, it becomes helpful in determining how scores obtained using newer norms compare to scores obtained using the old norms.

Recently, Riverside Publishing Company announced its recalculation of the Woodcock-Johnson III Tests of Achievement norms, based on the Census statistics of 2005. The statistics of 2005 included demographic changes like geographic shifts, increased urbanization, greater percentages of young children, and increases in minorities in the overall population. McGrew, Schrank, & Woodcock (2007) also noted significant changes in age, gender, race, Hispanic origin, and place of residence. Such changes in demographics make norms that were developed using previous census data (or old norms) unrepresentative of the target population.

McGrew et. al. (2007) indicated that the new normative data is more representative of the projected future population, which yielded a rather different portrayal of the U.S. population than the 1996 Census. However, there was no information provided as to the extent to which these new norms result in different *specific obtained scores*.

How are test scores derived from norms? To what extent are the two norms (original versus updated norms) comparable? The answers to these questions are important to know so

that changes in scores from testing based on original norms to testing based on updated norms can be reliably evaluated. In the WJ-III NU *Technical Manual*, McGrew et al. (2007) described how normative data for all WJ-III tests, WJ-III Cognitive and WJ-III Achievement, are based on a single sample representing the United States demographics, providing an accuracy not possible when comparing scores from separately normed tests. This procedure, called co-norming, helps the assessments to operate collectively as an accurate and valid problem-solving system for the purpose of evaluating domain-specific skills.

A phenomenon called the Flynn Effect refers to the steady rise in a population‟s intelligence scores over time, due to changes in demographics (Kanaya, Scullin, & Ceci, 2003). According to Resing & Tunteler (2007), the Flynn effect emphasizes that without revisions of a test‟s norms people would score better and better on tests. For example, students would score higher on a test that was normed in the 1970‟s than they would on a recently normed test. Hiscock (2007) found that Flynn credited the increase in IQ, particularly in the first half of the twentieth century in the United States, chiefly to increases in how many years of formal education a student experiences. This finding was based on the fact that the number of years that students attend public education in the United States increased from eight years to ten years between World War I and World War II. Hiscock (2007) further explained Flynn‟s explanation that a student‟s increased exposure to the school environment causes each student to be, "surrounded by fellow students who are more competent, better students make better teachers for the next generation of students, parents become more serious about schooling and homework, and the lengths of the school day and school year tend to increase."

According to Resing& Tunteler, (2007), test revisions are necessary at least every 10 years. Although the Flynn Effect refers to IQ tests, Hiscock (2007) determined that the results of

IQ tests complement information about a student‟s developmental, social, educational, and occupational history. This information can then be used to provide a more comprehensive depiction of the student. At the very least, the IQ test gives the administrator an idea about how the student will typically perform on other tests (i.e. achievement tests). Ultimately, renorming is needed so that a student‟s test performance can be more accurately compared to the average performance of the student‟s same aged peers.

A study called IQ Yo-Yo, explored the impact the Yo-Yo effect has on Intelligence Quotient (IQ) scores, which determine the diagnosis of mental retardation, based on renormed IQ tests. An example of the Yo-Yo effect is when rates of mental retardation among children appear to bottom out near the end of a particular test's run, followed by a rebound when a renormed test is introduced. Bower (2003) points out that average scores on particular IQ tests rise a few points every 3 or 4 years, and the test eventually becomes obsolete. About every 15 to 20 years, in order for the average score to be reset to 100, tests are renormed. This renorming causes the Yo-Yo effect in the number of mental retardation placements in United States schools. Scores on the renormed tests increase over time, pulling a number of children from just below to just above the 70 score cutoff for mental retardation. Children scoring near 70 score an average of almost 6 points lower, when given the same test after it has been renormed.

The 1998 edition of the Peabody Individual Achievement Test-Revised [1998 Normative Update] (PIAT-R), reflects updated norms based on the collection of data from 1995-1996. Cross (1998) conducted a review at the Virginia Polytechnic Institute in Blacksburg, VA, and determined that the norming of the PIAT-R was conducted in combination with the norming of the following 4 other achievement batteries published by the American Guidance Service (AGS): the Kaufman Test of Educational Achievement (K-TEA) [both brief and comprehensive], the

KeyMath--Revised, and the Woodcock Reading Mastery Tests--Revised (WRMT-R). None of the batteries underwent content changes during the norming process, based on data collected in 1995-1996. The new norm tables were developed using an overall representative sample consisting of 3,184 students in kindergarten - 12th grade in 129 locations in 40 states. In order to ensure selection of a nationally representative group at each grade, the researchers used a stratified multistage sampling method. Using the March 1994 U.S. Census Bureau data, sampling targets along with an additional 245 subjects were tested, including an adult population aged 18-22. These subjects were from educational organizations including two and four year colleges and vocational training programs; some participants were paid to participate. (Cross, 1998)

Cross (1998) found that changes like curriculum and educational practice, demographics of population, and general cultural environment can affect levels of academic achievement. Results of the PIAT-R showed that overall, there was a decrease in the number of students who scored in the Average range in Grades 1st through 3rd, however, in the secondary level, performance remained the same or showed increases. With the normative update, students in the Below Average range in grades 1st – 12th showed further decline in performance on five subtests; Reading Recognition, Reading Comprehension, Total Reading, Mathematics, and Spelling.

Woodcock (1973) also conducted a normative update for the Woodcock Reading Mastery Tests – Revised [1998 Normative Update] (WRMT-R). Crocker (1999), of the University of Florida, reviewed the normative update, noting that the Woodcock Reading Mastery Tests-Revised [1998 Normative Update] (NU) Edition (WRMT-R) is different from the 1987 edition only in updated norms. These were obtained from a new data collection design implemented in 1995-1996. The norming study included a nationwide sample of over 3,000 examinees from 129

locations in 40 states. The students examined were in grades K-12 or young adults, stratified by gender, race, parental education, and geographic region, reflecting the demographic distributions of the U.S. At each grade level, the number of participants ranged from 204-295 from the respective grades K - 12.

According to Crocker (1999), performance comparisons on the previous and newer norms suggest that students in the Below Average range earned scores in a higher percentile rank and standard score on the NU norm than would be obtained using norm tables of the previous edition, for most grade levels. For example, a student scoring at the 40th percentile, using the old norms, could actually answer correctly on fewer items when retesting with the same test, but remain at the 40th percentile rank, with the new norms. Crocker (1999) cautioned users when using these results in testing situations where the WRMT-R is used to re-assess students in special programs.

Butcher (2000) pointed out two ways that achievement tests can be renormed; re-administered the test to a sample of students that reflect the current demographics of the country, or re-analyze/reconfigure the original norm data. According to McGrew et al. (2007) Riverside Publishing reconfigured the original norm data, representing the most current U.S. population by using the 2005 U.S. Census data. McGrew et al. (2007) further described the Woodcock-Johnson III Tests of Achievement as a revised and expanded version of the Woodcock-Johnson Revised. It is designed to be an individually administered academic skills assessment for children, adolescents, and adults within the age range of 2 through 90 years, and covers the areas of 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, with most children obtaining a score between 85 and 115. The test uses easels: a standard battery containing subtests 1-11, as

well as a 12th supplemental subtest with an extended battery containing tests 13-22. The extended battery may be administered to students in order to determine relative strengths and weaknesses in specific academic areas. Test scores are reported for age/grade based norms as well as for percentiles.

McGrew et al. (2007) explained that scores are placed into the WJ-III scoring program, Compuscore and Profiles Program, and individual strengths and weaknesses can be computed in specific areas as a diagnostic profile. The student‟s strengths and weaknesses can then be used to develop educational programs like guidance provisions, growth, and program evaluation. The profiles acquired using the current normative data may differ from the profiles obtained using the original norms, because after a test is renormed a student‟s performance is compared to a different reference group. (McGrew et al., 2007) Further information on the impact that updated norms have on achievement scores and student placement is important, especially since Response to Intervention (RTI) has been implemented for the identification of learning disabilities in many districts. In fact, a study by Baca, Hoover, Saenz, & Wexler-Love (2007) of the University of Colorado-Boulder examined the National Implementation of RTI by state. Of the 44 state responders, 100% reported current implementation of RTI or consideration of the implementation of some form of the RTI model. In particular, 16 of those states reported to be in the planning stages of RTI implementation while 28 states had already put RTI into practice.

For Cummings (2008) master‟s thesis, she compared achievement scores of 15 and 18 year old students to see if the new norms would yield different scores than the original norms of WJ-III Achievement in the areas of Broad Reading, Broad Mathematics, and Broad Written Language. Using the original Compuscore program, raw scores were entered in order to create standard scores for each subtest as close to 70 as feasible, increasing each raw score by 15 points

until obtaining standard scores of 70, 85, 100, 115, and 130. Cummings (2008) then entered matching raw scores for each subtest using the „new" norms. The derived scores were calculated to determine how much each score varied from the other. Results showed a 1 to 3 point difference between specific skill areas, with some skill areas attaining a 5 to 6 point difference. Cummings (2008) focused on the WJ-III Broad Reading, Broad Mathematics, and Broad Written Language. Since there is limited research on the affects of updated norms on specific achievement subtests, this study will focus on the WJ-III Achievement areas of math: Calculation, Math Fluency, Applied Problems, Quantitative Concepts, and the Broad Math Cluster. Cummings (2008) study also focused on ages 15 and 18, while my study will focus on grades 1, 3, 6, 9, and 12. Although my study included grade 1 Applied Problems and Quantitative Concepts, grade 1 does not assess for Calculation and Math Fluency, therefore those subtests are not included in this study.

Need for Study

The WJ-III Normative Update report only gives the average Median values for the differences in scores between the two norm tables (McGrew et al. 2007). School psychologists could benefit from further knowledge, as they choose measures for students and there is a need for more literature stating the affects of the Woodcock-Johnson III Normative Update on specific obtained scores. Therefore, my study examined the differences based on skill level (low to high; 70-110), as close to 70, 80, 90, 100, and 110 as possible, and plotted the trend of individual raw scores to indicate any difference between math scores and whether these are consistent over levels for students who took the Woodcock-Johnson III.

The purpose of my study is to determine the extent to which the two scores of the math subtests, WJ-III original versus WJ-III NU, differ. In other words, does the WJ-III normative

update norms yield math scores that are different from math scores that would be obtained using the WJ-III original norms for individuals from the 1st, 2nd, 3rd, 6th, 9th, and 12th grades. The questions that will be examined are as followed:

I. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Calculation subtest for grade 3?

II. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Calculation subtest for grade 6?

III. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Calculation subtest for grade 9?

IV. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Calculation subtest for grade 12?

V. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Math Fluency subtest for grade 3?

VI. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Math Fluency subtest for grade 6?

VII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Math Fluency subtest for grade 9?

VIII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Math Fluency subtest for grade 12?

IX. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Applied Problems subtest for grade 1?

X. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Applied Problems subtest for grade 3?

XI. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Applied Problems subtest for grade 6?

XII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Applied Problems subtest for grade 9?

XIII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Applied Problems subtest for grade 12?

XIV. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Quantitative Concepts subtest score for grade 1?

XV. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Quantitative Concepts subtest score for grade 3?

XVI. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Quantitative Concepts subtest score for grade 6?

XVII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Quantitative Concepts subtest score for grade 9?

XVIII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Quantitative Concepts subtest score for grade 12?

XIX. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Broad Math cluster scores for grade 3?

XX. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Broad Math cluster scores for grade 6?

XXI. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Broad Math cluster scores for grade 9?

XXII. Are the obtained scores on the WJ-III Normative Update lower than scores using the WJ-III original norms, given the same raw scores, on the Broad Math cluster scores for grade 12?

Chapter II Method

WJ- III Test of Achievement

The Normative Update of the Woodcock Johnson III Tests of Achievement (WJ-III NU) is a recalculation in accordance with the 2005 U.S. Census statistics, using the updated norm construction procedure of the Woodcock-Johnson III. (McGrew et al., 2007)

Procedure

Using the Normative Update Compuscore program, raw scores were entered in order to formulate the standard scores for each subtest as close to 70 as possible. Raw scores were then increased by 10 points each until standard scores of 70, 80, 90, 100 and 110 were achieved. Equal raw scores for each subtest were entered into the original Compuscore program using the „new" norms. This procedure was used to obtain scores, derived from the original and the updated norms for each Math subtest on the standard battery of the WJ-III (form A) for grades 1, 3, 6, 9, and 12. The achieved standard scores for the subtests are graphed for each grade level, based on grade level norms**.**

Subjects

This study was conducted using the original and updated norms of the WJ-III, and did not use data collected from the administration of the Woodcock-Johnson III to real subjects.

Chapter III Results

Results for 3rd Grade – Calculation

Table 1 presents the score differences between the WJ-III updated and original norms for 3rd grade on the Calculation subtest. The two scoring systems yielded identical scores for the Average range at 100. The original norms yielded slightly higher scores for Below Average and slightly lower High Average scores obtained from the normative update.

Table 1

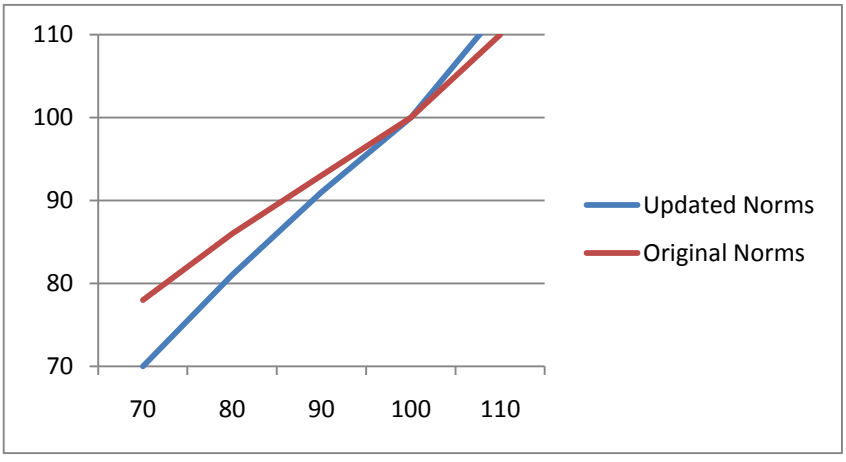
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Calculation

Updated Norms	Original Norms	Difference*
70	78	-8
81	86	-5
91	93	-2
100	100	0
113	110	+3

*Updated norms minus original norms

Figure 1

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Calculation



Results for 6th Grade – Calculation

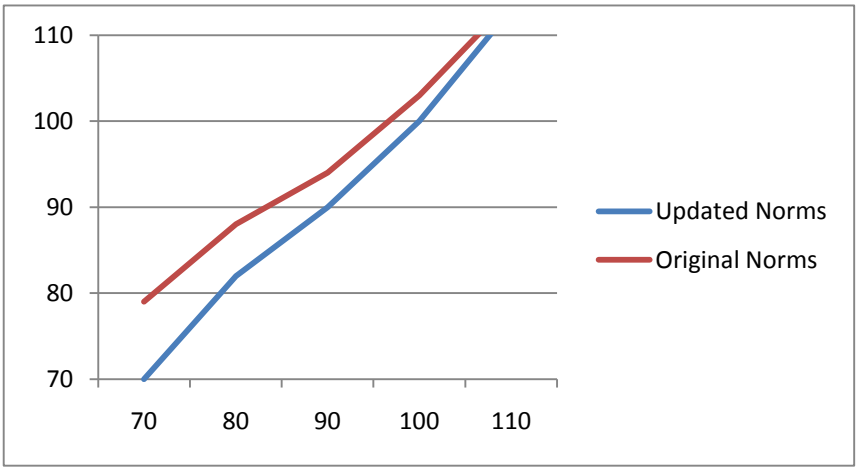
Table 2 presents the score differences between the WJ-III updated and original norms for 6th grade on the Calculation subtest. The two scoring systems differed by one to 9 points with the original norms yielding the higher score.

Updated Norms	Original Norms	Difference*
70	79	-9
82	88	-6
90	94	-4
100	103	-3
113	114	-1

*Updated norms minus original norms

Figure 2

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Calculation



Results for 9th Grade – Calculation

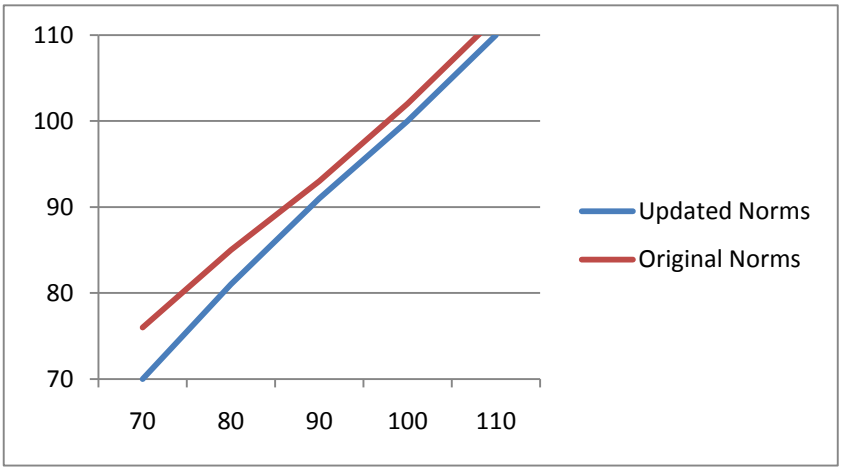
Table 3 presents the score differences between the WJ-III updated and original norms for 9th grade on the Calculation subtest. The two scoring systems differed by one to 5 points with the original norms yielding the higher score.

Updated Norms	Original Norms	Difference*
71	76	-5
81	85	-4
91	93	-2
100	102	-2
110	112	-2

*Updated norms minus original norms

Table 3

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Calculation



Results for 12th Grade – Calculation

Table 4 presents the score differences between the WJ-III updated and original norms for 12th grade on the Calculation subtest. The two scoring systems yielded identical scores for the Above Average range. The original norms yielded slightly higher scores for Below and Low Average scores, yet the updated scoring system yielded slightly higher scores for the Average range.

Table 4

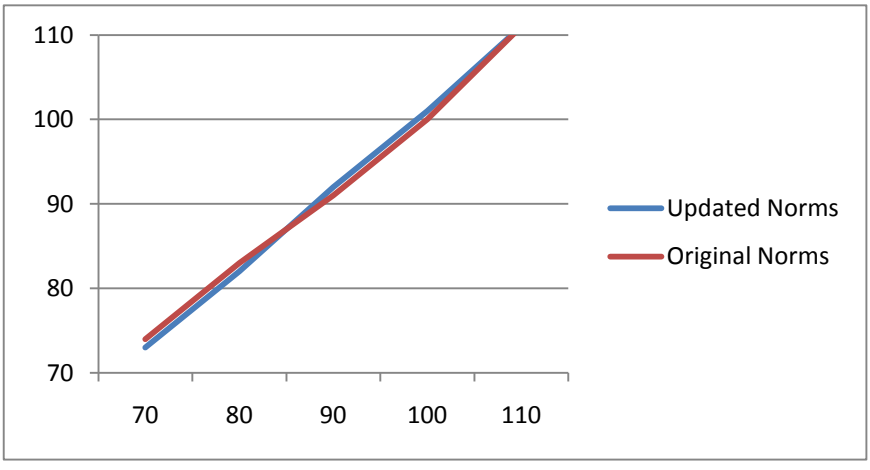
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Calculation

Updated Norms	Original Norms	Difference*
73	74	-2
82	83	-1
92	91	+1
101	100	+1
111	111	0

*Updated norms minus original norms

Figure 4

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Calculation



Results for 3rd Grade – Math Fluency

Table 5 presents the score differences between the WJ-III updated and original norms for 3rd grade on the Math Fluency subtest. The two scoring systems differed by only two to 3 points with the original norms yielding the higher score.

Table 5

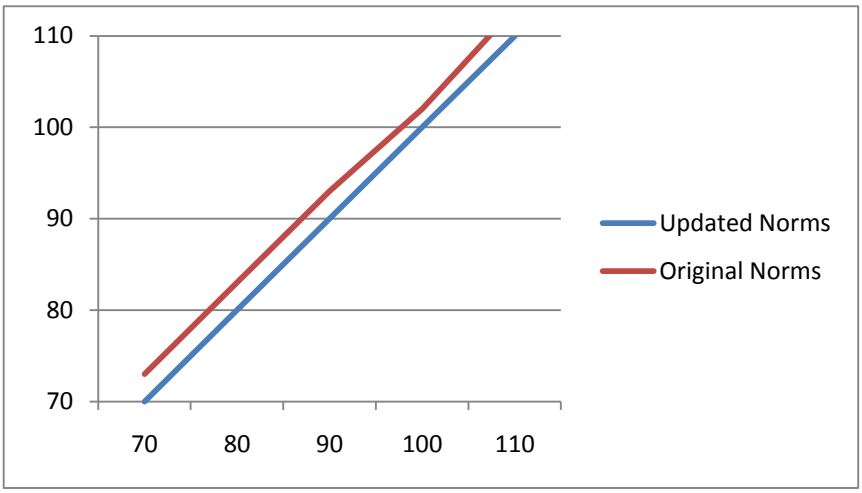
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Math Fluency

Updated Norms	Original Norms	Difference*
70	73	-3
80	83	-3
90	93	-3
100	102	-2
110	113	-3

*Updated norms minus original norms

Figure 5

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Math Fluency



Results for 6th Grade – Math Fluency

Table 6 presents the score differences between the WJ-III updated and original norms. The two scoring systems yielded identical scores for the Average range at 100. The original norms yielded slightly higher scores, one to 3 points, for Below and Above Average scores obtained from the normative update.

Table 6

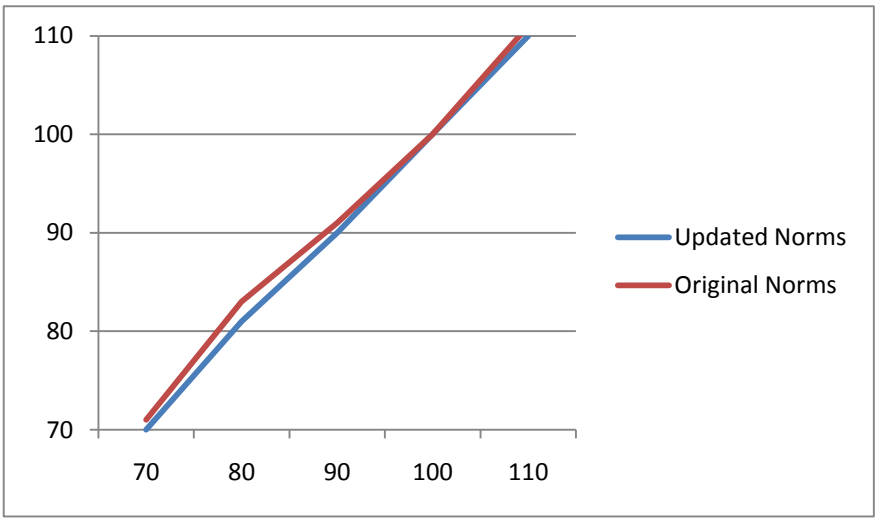
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Math Fluency

Updated Norms	Original Norms	Difference*
70	71	-1
81	83	-2
90	91	-1
100	100	0
110	111	-1

*Updated norms minus original norms

Figure 6

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Math Fluency



Results for 9th Grade – Math Fluency

Table 7 presents the score differences between the WJ-III updated and original norms. The two scoring systems yielded identical scores for the Average range (90 & 100). The original norms yielded slightly higher scores, one to 2 points, for Below and Above Average scores obtained from the normative update.

Table 7

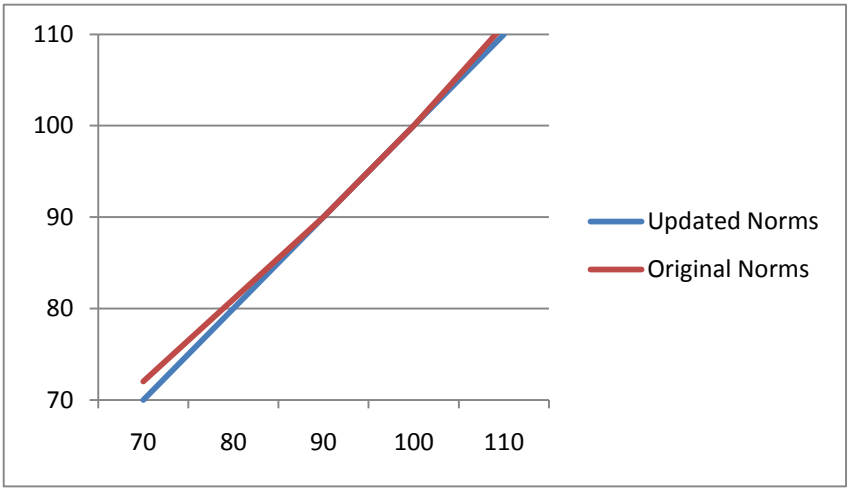
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Math Fluency

Updated Norms	Original Norms	Difference*
70	72	-2
80	81	-1
90	90	0
100	100	0
110	111	-1

*Updated norms minus original norms

Figure 7

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Math Fluency



Results for 12th Grade – Math Fluency

Table 8 presents the score differences between the WJ-III updated and original norms. The two scoring systems yielded identical scores for the Average range at 90. The original norms yielded slightly higher scores, one to 3 points, for Below Average scores obtained from the normative update, with Average scores, at 100, and Above Average scores slightly higher for the normative update.

Table 8

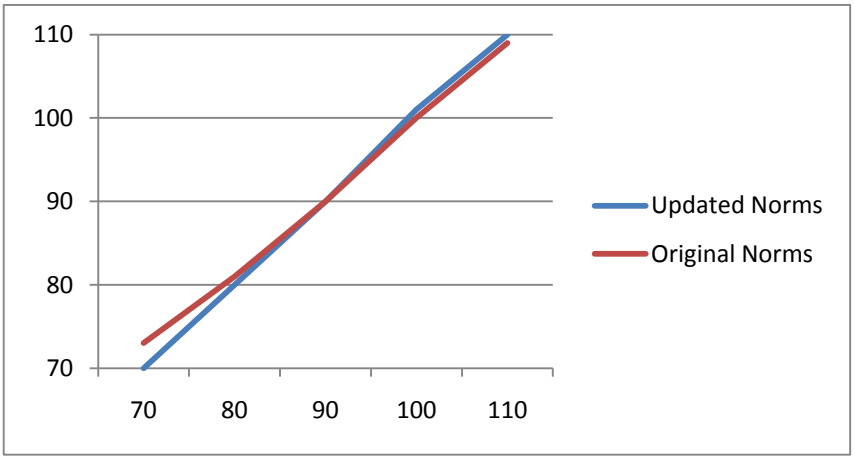
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Math Fluency

Updated Norms	Original Norms	Difference*
70	73	-3
80	81	-1
90	90	0
101	100	+1
110	109	+1

*Updated norms minus original norms

Figure 8

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Math Fluency



Results for 1st Grade – Applied Problems

Table 9 presents the score differences between the WJ-III updated and original norms. The original norms yielded slightly higher scores, one to 5 points, for Below Average and Average scores (at 90) obtained from the normative update, with Average scores (at 100) and Above Average scores slightly higher for the normative update.

Table 9

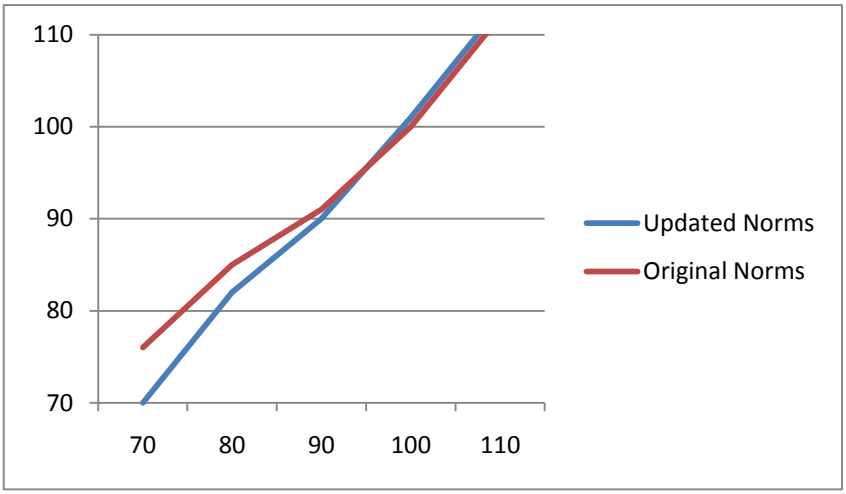
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 1st grade for Applied Problems

Updated Norms	Original Norms	Difference*
71	76	-5
82	85	-3
90	91	-1
101	100	+1
113	112	+1

*Updated norms minus original norms

Figure 9

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 1st grade for Applied Problems



Results for 3rd Grade – Applied Problems

Table 10 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only two to 5 points with the original norms yielding the higher score.

Table 10

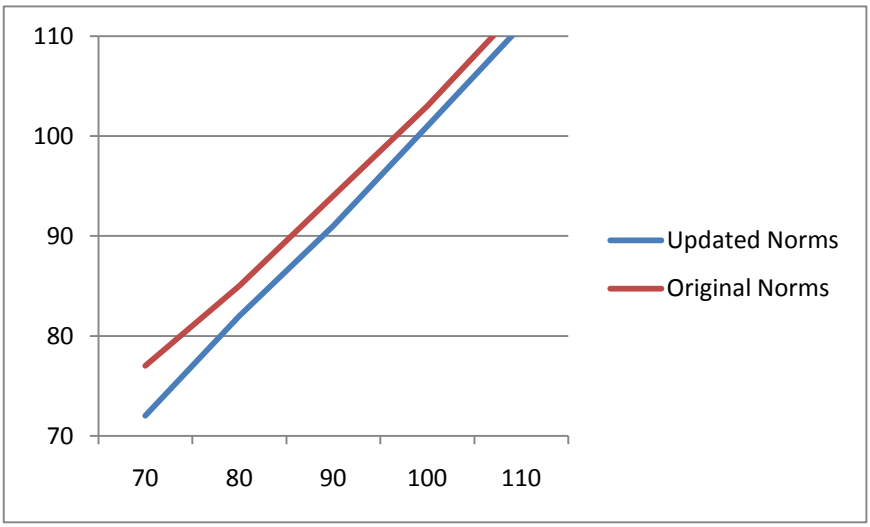
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Applied Problems

Updated Norms	Original Norms	Difference*
72	77	-5
82	85	-3
91	94	-3
101	103	-2
111	113	-2

*Updated norms minus original norms

Figure 10

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Applied Problems



Results for 6th Grade – Applied Problems

Table 11 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only two to 5 points with the original norms yielding the higher score.

Table 11

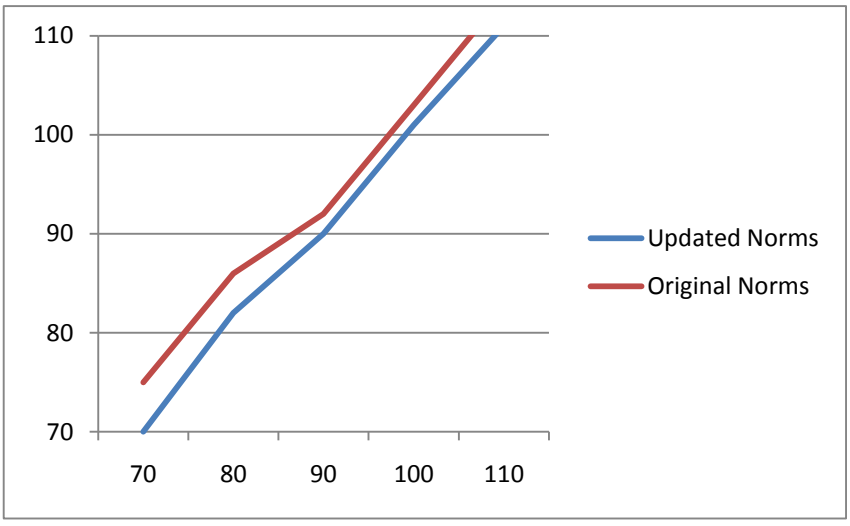
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Applied Problems

Updated Norms	Original Norms	Difference*
70	75	-5
82	86	-4
90	92	-2
101	103	-2
111	114	-3

*Updated norms minus original norms

Figure 11

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Applied Problems



Results for 9th Grade – Applied Problems

Table 12 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only one to 2 points with the original norms generally yielding the higher score, with Average scores at 90 and Above Average scores identical for both the normative update and original norms.

Table 12

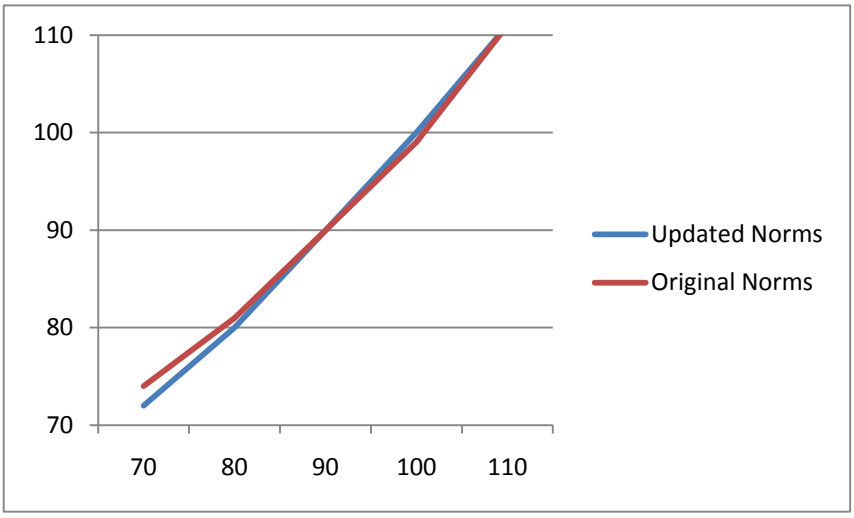
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Applied Problems

Updated Norms	Original Norms	Difference*
72	74	-2
80	81	-1
90	90	0
100	99	-1
111	111	0

*Updated norms minus original norms

Figure 12

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Applied Problems



Results for 12th Grade – Applied Problems

Table 13 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only one to 4 points with the original norms yielding the higher score.

Table 13

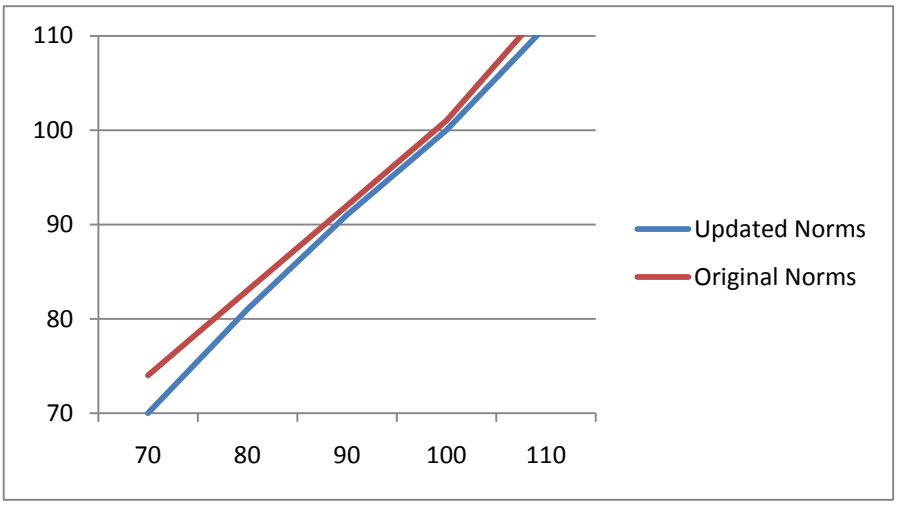
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Applied Problems

Updated Norms	Original Norms	Difference*
70	74	-4
81	83	-2
91	92	-1
100	101	-1
111	113	-2

*Updated norms minus original norms

Figure 13

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Applied Problems



Results for 1st Grade – Quantitative Concepts

Table 14 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by 4 or 5 points with the original norms yielding the higher score.

Table 14

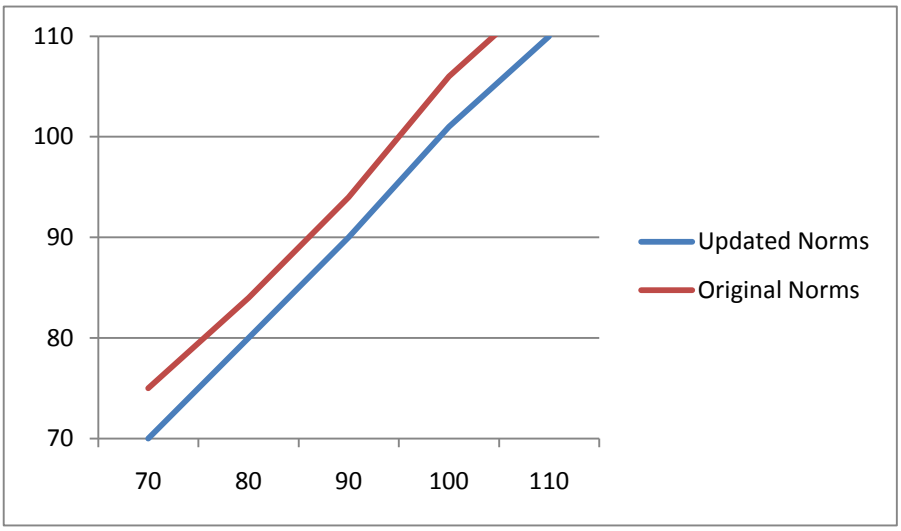
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 1st grade for Quantitative Concepts

Updated Norms	Original Norms	Difference*
70	75	-5
80	84	-4
90	94	-4
101	106	-5
110	115	-5

*Updated norms minus original norms

Figure 14

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 1st grade for Quantitative Concepts



Results for 3rd Grade – Quantitative Concepts

Table 15 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only two to 5 points with the original norms yielding the higher score.

Table 15

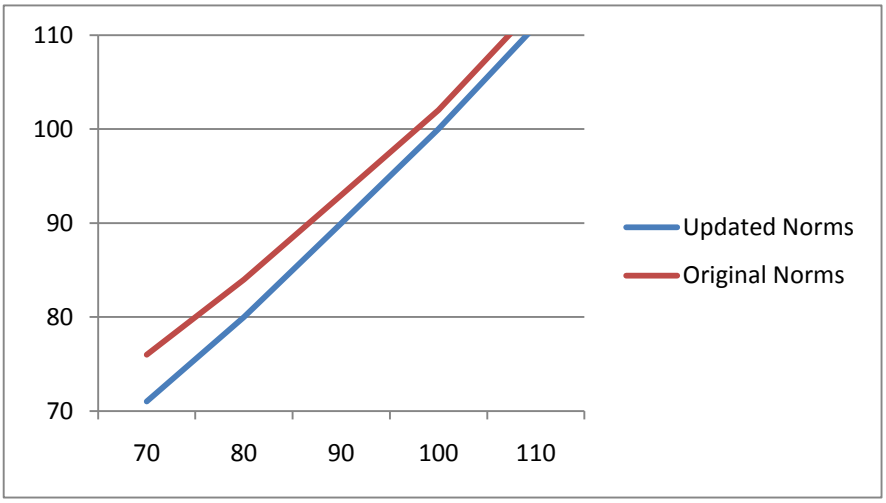
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Quantitative Concepts

Updated Norms	Original Norms	Difference*
71	76	-5
80	84	-4
90	93	-3
100	102	-2
111	113	-2

*Updated norms minus original norms

Figure 15

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Quantitative Concepts



Results for 6th Grade – Quantitative Concepts

Table 16 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only two to 6 points with the original norms yielding the higher score.

Table 16

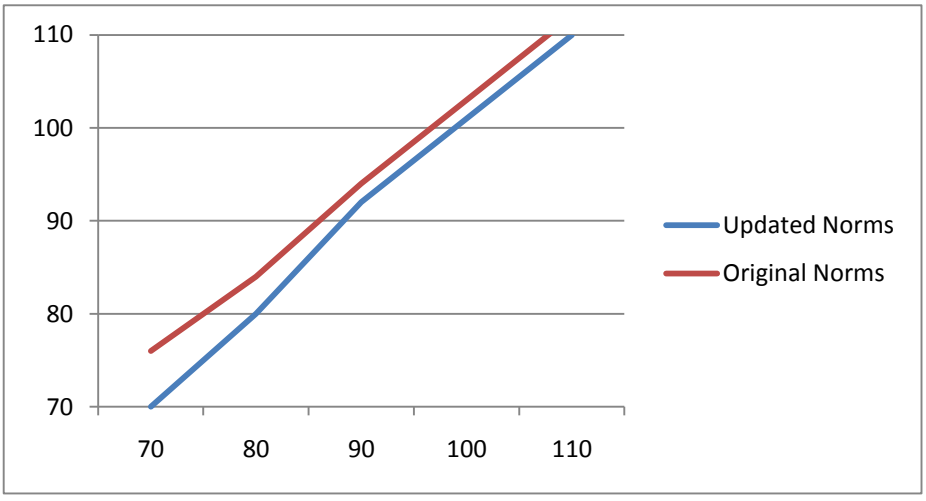
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Quantitative Concepts

Updated Norms	Original Norms	Difference*
70	76	-6
80	84	-4
92	94	-2
101	103	-2
110	112	-2

*Updated norms minus original norms

Figure 16

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Quantitative Concepts



Results for 9th Grade – Quantitative Concepts

Table 17 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only two to 5 points with the original norms yielding the higher score.

Table 17

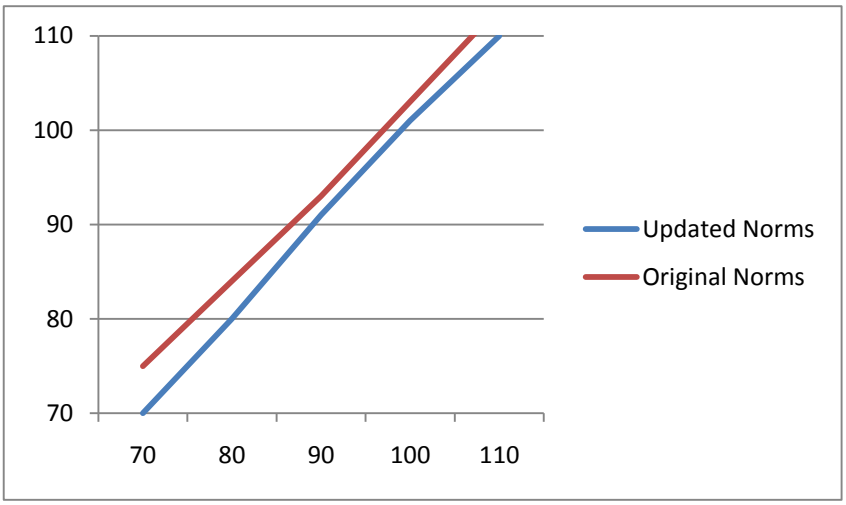
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Quantitative Concepts

Updated Norms	Original Norms	Difference*
70	75	-5
80	84	-4
91	93	-2
101	103	-2
111	113	-2

*Updated norms minus original norms

Figure 17

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Quantitative Concepts



Results for 12th Grade – Quantitative Concepts

Table 18 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by one to 6 points with the original norms yielding the higher score.

Table 18

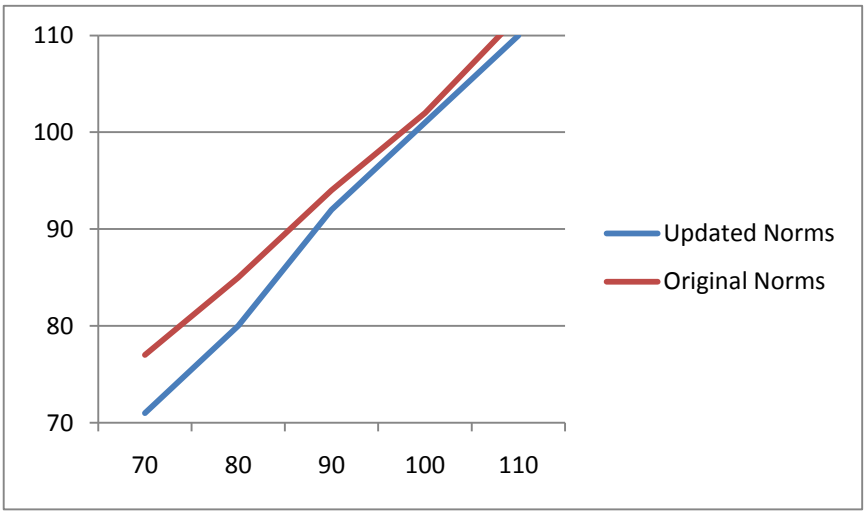
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Quantitative Concepts

Updated Norms	Original Norms	Difference*
71	77	-6
80	85	-5
92	94	-2
101	102	-1
110	112	-2

*Updated norms minus original norms

Figure 18

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Quantitative Concepts



Results for 3rd Grade – Broad Math

Table 19 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by nine to 12 points for Below Average ranges and only one to 5 points for Average to Above Average scores with the original norms yielding the higher score for all ranges.

Table 19

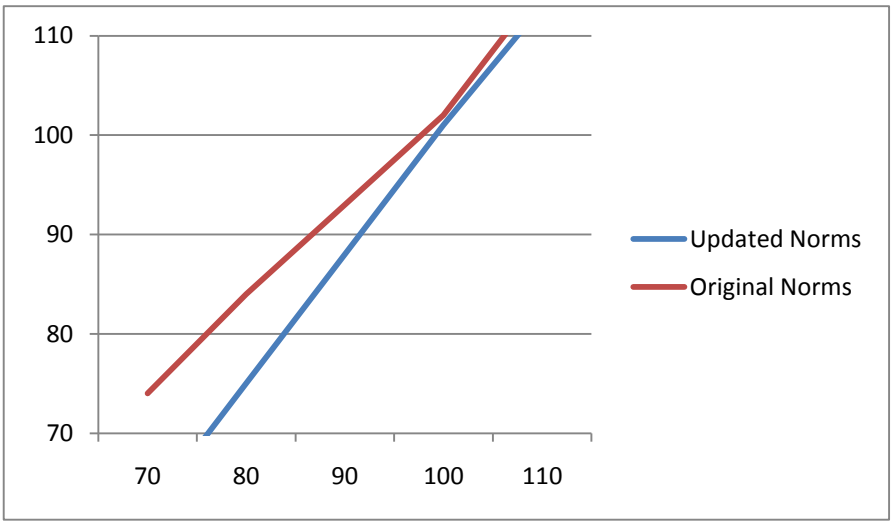
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Broad Math

Updated Norms	Original Norms	Difference*
62	74	-12
75	84	-9
88	93	-5
101	102	-1
113	115	-2

*Updated norms minus original norms

Figure 19

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 3rd grade for Broad Math



Results for 6th Grade – Broad Math

Table 20 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by two to 9 points with the original norms yielding the higher scores.

Table 20

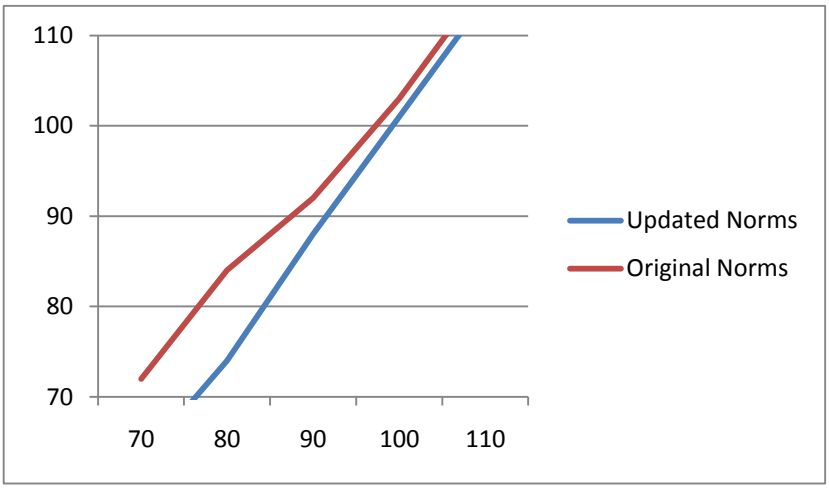
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Broad Math

Updated Norms	Original Norms	Difference*
63	72	-9
78	84	-6
88	92	-4
101	103	-2
114	116	-2

*Updated norms minus original norms

Figure 20

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 6th grade for Broad Math



Results for 9th Grade – Broad Math

Table 21 presents the score differences between the WJ-III updated and original norms. The two scoring systems yielded identical scores for the Average and Above Average ranges and differed by only one to 4 points with the original norms yielding the higher scores.

Table 21

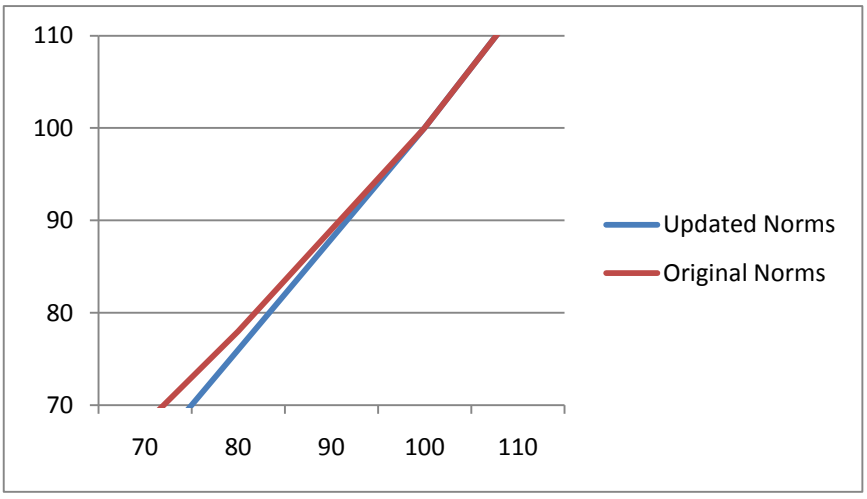
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Broad Math

Updated Norms	Original Norms	Difference*
64	68	-4
76	78	-2
88	89	-1
100	100	0
113	113	0

*Updated norms minus original norms

Figure 21

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 9th grade for Broad Math



Results for 12th Grade – Broad Math

Table 22 presents the score differences between the WJ-III updated and original norms. The two scoring systems differed by only one point, with identical scores for the Low Average range. The original norms yielded the higher scores.

Table 22

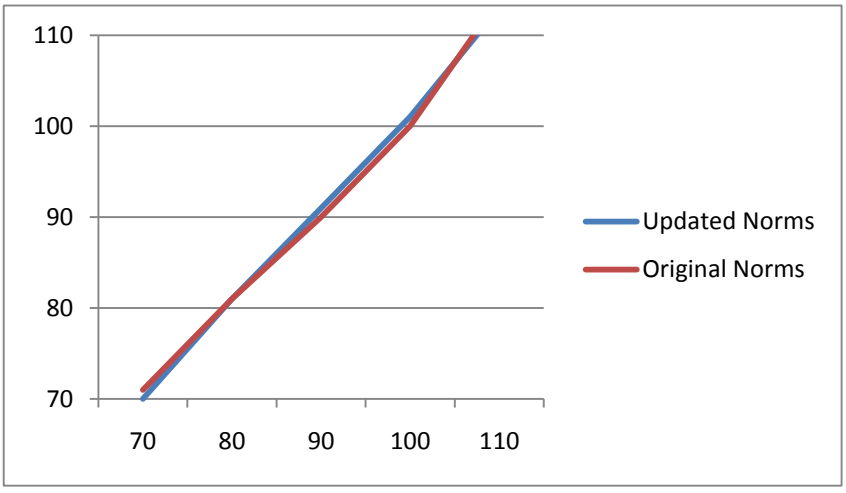
Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Broad Math

Updated Norms	Original Norms	Difference*
70	71	-1
81	81	0
91	90	-1
101	100	+1
113	114	-1

*Updated norms minus original norms

Figure 22

Comparison of WJ-III Achievement Scores using Updated and Original Norms for 12th grade for Broad Math



Chapter IV

Discussion

Much like the Cummings (2008) master‟s thesis concluded, the two scoring systems yielded scores that were generally very similar with scores based on the updated and original not differing by more than 1 to 3 points. However there were a few exceptions. The Calculation and Broad Math scores for 3rd and 6th grades were significantly different with the original norms scoring higher than the updated norms by 8 to 12 points. Interestingly, these large differences only happened with scores lower than the below average range. Based on the theory of the Flynn Effect, original norm scores would be expected to be higher, however, that was not the case in every instance. As an example, the updated norms yielded slightly higher scores for Calculation in the Average range and Math Fluency in the Average to High Average ranges for 12th grade as shown in tables 4 and 8. The normative update scores were also higher than the original norm scores for 3rd grade Calculation for Above Average scores and 1st grade Applied Problems for Average and Above Average scores as shown in tables 1 and 9. The difference between the scores of the original and updated norms would have to be 5 points or more to be considered significant, since it would be a third of a standard deviation and could lead to a difference in the interpretation of a student‟s skills in specific measured areas. For this study, generally none of the score differences was above 3. However, the original norms did yield much higher scores for 3rd and 6th grade in the Below Average range for Calculation and Broad Math, than the normative update. These score differences may lead to interpretations about a student‟s skills in the specific measured areas.

These comparison results indicate that scores that are based on updated norms are similar to the scores based on the original norms, with the exception of the significant difference between 3rd and 6th grade Below Average Calculation and Broad Math scores. Thus, administrators can compare the score results of evaluations attained with updated norms with scores attained with original norms. If scores between the WJ-III test sessions exhibit significant changes, one can conclude the disparity is related to student skills and not the norm tables. An exception to such a conclusion would be in situations noted above for Calculation and Broad Math, where the score differences are between six and twelve points. These differences should be considered by practitioners when a comparison of current test scores using the normative updates with WJ-III scores from previous scores obtained from original norms.

This study is limited to students in grades 1st, 3rd, 6th, 9th, and 12th and cannot be generalized to other grades. This study also only examined basic battery math subtests and the broad math cluster scores of the extended battery. The Cognitive Battery was not included in this study; therefore, the extent to which the new norms would affect the ability and achievement discrepancy scores could not be determined.

Future Research

Future research could look at updated and original norm score differences including the extended battery, as well as the cognitive battery in order to attain cluster scores and ability/achievement discrepancy scores. Research could also examine specific subtests for every grade level, providing vital information in order to contribute to the understanding of how important these updated norms are when making educational decisions for school aged children.

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