



Describing Skill Proficiency Using the Relative Proficiency Index (RPI): A Unique Lens into a Student's Functioning

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Agenda

Review various levels of data that can be collected from the WJ IV batteries

Introduce the W-Score

Introduce the Relative Proficiency Index (RPI)

Discuss the uses of the RPI

Summary

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Learning Objectives



Distinguish between the standard score and the relative proficiency index (RPI) when describing a student's performance on a test



Understand the power of the RPI and the benefits of incorporating it into the analysis and interpretation of the student's skill functioning



Learn the importance of using the RPI for educational programming

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Woodcock-Johnson® III Assessment Service Bulletin Number 11

Development, Interpretation, and Application of the W Score and the Relative Proficiency Index

Lynne E. Jaffe, PhD

Resources

The Woodcock-Johnson III (WJ III®) (Woodcock, McGrew, & Mather, 2001a) provides a wide variety of score options for interpreting an individual's test performance. Many of these scores, such as standard scores (SS), percentile ranks (PR), age equivalents (AE), and grade equivalents (GE) are provided by most other educational and psychological tests. However, the WJ III tests are unique in providing two metrics that report the quality of an individual's performance: the W score and the relative proficiency index (RPI). The W score is the foundational metric—the score on which all of the other WJ III scores are based—and it is useful for measuring an individual's progress over time. The RPI is a measure of a person's proficiency in a skill, ability, or area of knowledge compared with average age or grade peers. Since the W score and the RPI are not available in most other assessments, many psychologists and diagnosticians may be unaware of the clinical utility of these metrics. The purpose of this bulletin is to familiarize users of the WJ III with the development, interpretation, and application of the W score and the RPI. Specifically, this bulletin describes the levels of interpretive information available in the WJ III, explains the special characteristics and usefulness of the W scale, and describes how the RPI fits into the hierarchy of information used to interpret test results. In addition, the bulletin explains the differences between the RPI and peer-comparison scores and the usefulness of the RPI in clarifying diagnostic profiles and designing interventions. Finally, it describes considerations for using the RPI in view of the Individuals with Disabilities Education Act (IDEA) 2004 and discusses the use of the RPI in clinical research.



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Levels of Information for the WJ IV

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Levels of Information Provided by the WJ IV

| Level 1 | Level 2 | Level 3 | Level 3 |
|--|---|--|--|
| <p>Qualitative, informal, error analysis</p> <p>Useful for instructional planning</p> <ul style="list-style-type: none"> • Test Session Observations Checklist • Useful for behavioral observations | <p>Level of Development</p> <p>Age Equivalent</p> <ul style="list-style-type: none"> • Level of Instruction • Grade Equivalent | <p>Level of Proficiency</p> <p>Relative Proficiency Index, CALP</p> <ul style="list-style-type: none"> • Easy to Difficult Range • Developmental/Instructional Zone | <p>Relative Standing in Group</p> <p>Standard Scores</p> <ul style="list-style-type: none"> • Rank Order • Percentile Ranks • Significantly high or low standing • Discrepancy PR, SD |

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Level 1: Qualitative Data

| Level | Type of Information | Basis | Information and Scores | Uses |
|-------|--|---|---|---|
| 1 | Qualitative (Criterion Referenced)—Describes context or supports a clinical hypothesis | Observations during testing and analysis of responses | <ul style="list-style-type: none"> • Description of the individual's behavior during testing • Patterns of errors and correct responses within specific tasks • Strategies (correct or erroneous) used to perform specific tasks | <ul style="list-style-type: none"> • Consideration of the possible effect of the individual's behavior on the obtained test scores • Prediction of the individual's behavior and reactions in instructional situations • Analysis of an individual's strengths, misunderstandings, and limitations regarding specific academic skills, procedures, knowledge, and cognitive abilities • Instructional recommendations for specific skills |

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| Level | Type of Information | Basis | Information and Scores | Uses |
|-------|---|--|--|---|
| 2 | Level of Development (Norm Referenced)—Indicates an individual's level of development, such as age or grade equivalents | Sum of item scores Age or grade level in the norming sample at which the median score is the same as the individual's score | <ul style="list-style-type: none"> • Raw score • T test or cluster W score • Age equivalent (AE) • Grade equivalent (GE) | <ul style="list-style-type: none"> • Reporting an individual's general level of development in a skill, ability, or area of knowledge compared with others of the same age or in the same grade in the norming sample • Monitoring an individual's progress within a specific skill or ability • Basis for describing the implications of developmental strengths and weaknesses • Basis for initial recommendations regarding instructional level and materials • Placement decisions based on a criterion of significantly advanced or delayed development |
| 3 | Proficiency (Criterion Referenced)—Indicates the quality of performance on criterion tasks of a given difficulty level | Distance of an individual's score on the W scale from an age or grade reference point | <ul style="list-style-type: none"> • Quality of performance on assessed skills and abilities compared to that of age or grade peers in the norming sample • T test or cluster W difference (WDIFF) • Relative proficiency index (RFI) • Cognitive-academic language proficiency (CALP) level • Instructional or developmental zone | <ul style="list-style-type: none"> • Degree of proficiency on tasks mastered by average age or grade peers • Developmental level at which the individual will perceive typical tasks to be easy, mildly challenging, or very difficult • Placement decisions based on a criterion of significantly strong or weak proficiency • Prediction of performance with similar task |
| 4 | Relative Standing in a Group (Norm Referenced)—Provides a basis for making peer comparisons (percentile ranks or standard scores) | Relative position (A transformation of a difference score, such as dividing it by the standard deviation of the reference group) | <ul style="list-style-type: none"> • Rank order • Standard score (SS) (including T score, z score, NCE, discrepancy/SD DIFF) • Percentile rank (PR) (including discrepancy PR) | <ul style="list-style-type: none"> • Statement of the relative (ordinal) position of an individual's score, based on the standard deviation (SD), within the range of scores obtained by age or grade peers in the norming sample • Placement decisions based on a criterion of significantly high or low standing in a group |

Note: Adapted from *Examiner's Manual: Woodcock-Johnson III Tests of Cognitive Abilities* (p. 66) by N. Mather and R. W. Woodcock, 2001, Rolling Meadows, IL: Riverside Publishing. Copyright 2001 by The Riverside Publishing Company. Adapted with permission.

Levels 2-4 Data

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What is the W-Score?

Unit of the W scale, the W-Score is the foundational metric- the score on which all the other WJ scores are based

SS, PR, RPI

Most useful for measuring an individual's progress over time

Unique metric to the WJ battery of tests

WJ IV Cog, Ach, OL

WJ IV ECAD

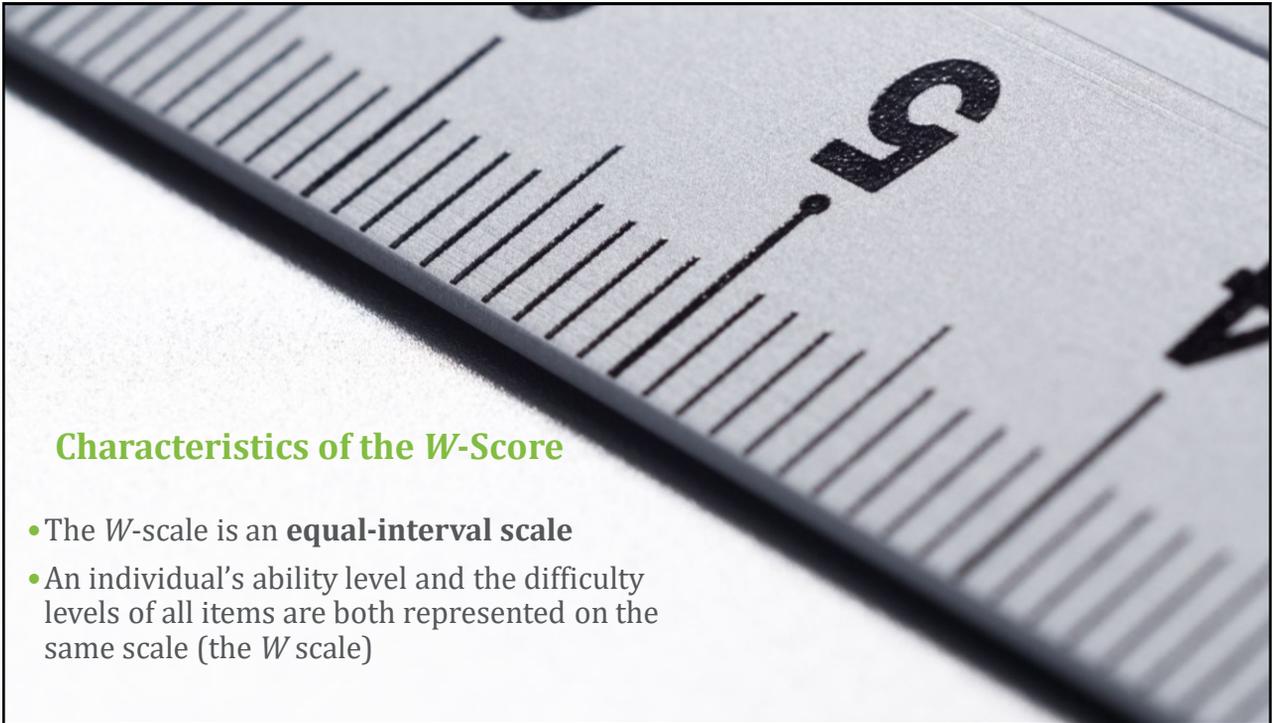
WMLS III

Bateria IV Cog & Ach

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Characteristics of the *W*-Score

- The *W*-scale is an **equal-interval scale**
- An individual's ability level and the difficulty levels of all items are both represented on the same scale (the *W* scale)

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Taking the Wha??? Out of the *W* Score

- The ***W* difficulty** of an item is indicated by its relative position on the *W* scale. Higher *W* difficulties are associated with more difficult items; lower *W* difficulties are associated with easier items
- The ***W* ability** is the *W* score that represents the individual's level of ability on the task presented

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- Once items are administered and data have been collected from the entire norming sample, the W scores are anchored, or linked, to age and grade levels in increments of year and month.
- **Reference W** is the median W score for any age or grade group on a specific test.
 - Criterion to which the individual's W ability is compared
 - Represents the difficulty level of a hypothetical item to which 50% of the age or grade group would respond correctly.

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Using a Measure of the W Score to Describe Student Proficiency & Predict Student Success

Relative Proficiency Index (RPI)

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Relative Proficiency Index (RPI)

Hidden jewel of the WJ IV products

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Uses of RPI

The RPI has several important uses based on the information it provides. These uses include:

- Informing users about how difficult an examinee will find age/grade appropriate tasks
- Describing the quality of an examinee's performance on tasks
- Offering criterion-referenced information
- Helping to monitor progress
- Indicating where on the range of development or instruction the examinee falls ("Developmental Zone")

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RELATIVE PROFICIENCY INDEX (RPI)



Provides a *critierion-referenced index* of a person's proficiency or functionality.



Compares the quality of performance on assessed skills and abilities to that of age or grade peers in the norming sample



Predicts level of success on similar tasks.



Shows actual distance from average proficiency.



Based on the W Difference score.



Ranges from 0/90 to 100/90.

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RELATIVE PROFICIENCY INDEX (RPI)

RPI scores are represented as fractions (e.g., 70/90)

- The **numerator** represents the examinee's predicted proficiency if given similar tasks
- The **denominator** is fixed at 90, indicating the proficiency on average same-age or same-grade peers
- For example, if an examinee obtains an RPI of 75/90 on Test 8: Oral Reading, it indicates that the examinee was 75% successful on an oral reading task that average people at the examinee's same age or grade reference group would perform with 90% success.

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RELATIVE PROFICIENCY INDEX (RPI)

Reflects the individual's proficiency on tasks that the average age or grade mate would have 90% proficiency.



Examples:

When average grade mates would have 90% success in spelling, Sandy is predicted to have only 4% success (RPI = 4/90). Her proficiency on spelling tests would be very limited.

Bennett's RPI of 98/90 on the Math Problem Solving cluster indicates his performance would be very advanced compared to his grade peers.

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| W Difference Values | Reported RPI | Proficiency | Implications |
|---------------------|-----------------|---------------------|---------------------|
| +31 and above | 100/90 | Very Advanced | Extremely Easy |
| +14 to +30 | 98/90 to 100/90 | Advanced | Very Easy |
| +7 to +13 | 95/90 to 98/90 | Average to Advanced | Easy |
| -6 to +6 | 82/90 to 95/90 | Average | Manageable |
| -13 to -7 | 67/90 to 82/90 | Limited to Average | Difficult |
| -30 to -14 | 24/90 to 67/90 | Limited | Very Difficult |
| -50 to -31 | 3/90 to 24/90 | Very Limited | Extremely Difficult |
| -51 & below | 0/90 to 3/90 | Extremely Limited | Nearly Impossible |

INTERPRETATION OF RPI SCORES

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RPI and Instructional Zone

The instructional zone is a special application of the RPI score.

It is based on a range along a developmental scale that indicates and examinee's present level of functioning.

It ranges from easy (the Independent Instructional level to difficult (the Frustration Instructional level)

| RPI | Instructional Level |
|-----------------|---------------------|
| 96/90 to 100/90 | Independent |
| 76/90 to 95/90 | Instructional |
| 75/90 & below | Frustration |

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RPI and Instructional Zone

- An examinee with an RPI of 80/90 is expected to be at the instructional level and should find similar tasks developmentally appropriate.
- An examinee with an RPI of 60/90 is expected to demonstrate frustration on similar tasks when compared to average same-age or same-grade peers. Similar tasks are expected to be developmentally challenging.

| RPI | Instructional Level |
|-----------------|---------------------|
| 96/90 to 100/90 | Independent |
| 76/90 to 95/90 | Instructional |
| 75/90 & below | Frustration |

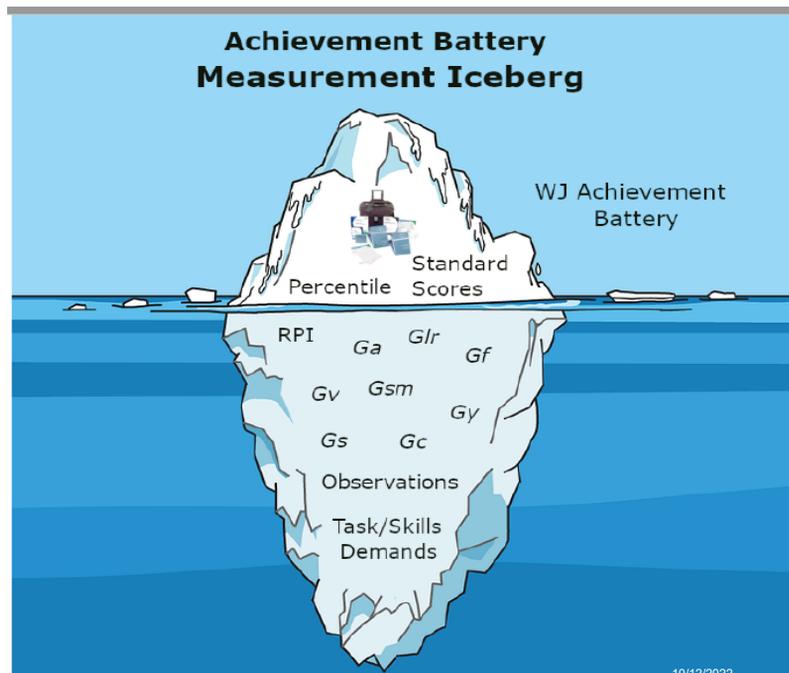
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Proficiency vs. Position

RPI vs Standard Score

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Proficiency vs. Position

Provide two very different pieces of data



Relative Proficiency Index (RPI) is a criterion referenced score that describes student's proficiency and functioning on a skill



Standard scores are ordinal data and represent relative standing in a norm group and do not describe functioning

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Standard Scores are Not Equivalent to Functioning

The fundamental **misunderstanding** and **common interpretive error** with standard scores being equivalent to functioning or performance. This leads to faulty generalizations.

For example, a standard score of 90 on a memory test could be Misinterpreted to mean the student has "average" functioning in memory when in fact a more accurate description of this score is that it represents an individual's relative position or "place" in line as it is ordinal data (Jaffe, 2009; Adeyemi, 2010).

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Looking beyond the standard score and considering the student's performance through other lenses can provide a richer understanding of the learner

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PROFICIENCY VS. POSITION

- ❑ At times, the proficiency information provides insights into performance that are not revealed by standard scores or percentile ranks.
- ❑ If only the standard score is considered, we may miss important information about the student's functioning.

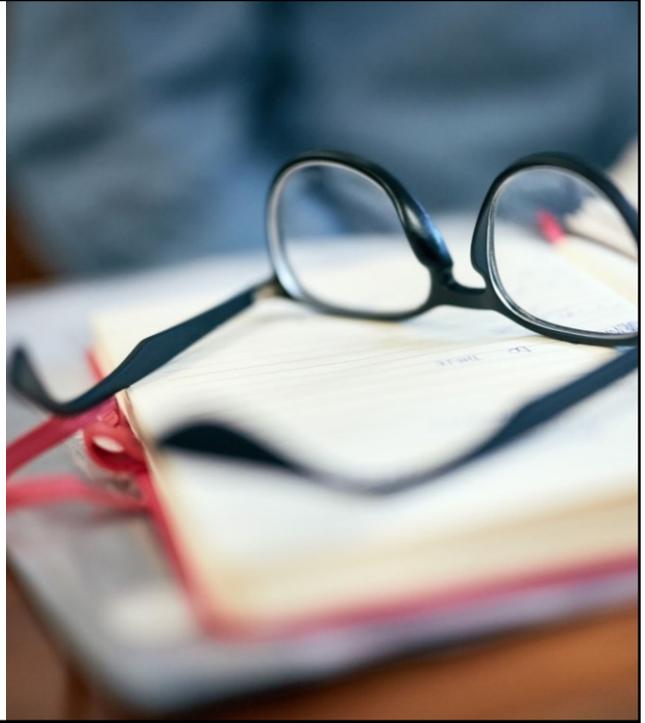
| | | | | | | | |
|--------------------------|-----|-----|-------|--------------------|------------|----|----|
| READING FLUENCY | 473 | 8-3 | 63/90 | Limited | 92 (86-97) | 92 | 29 |
| Oral Reading | 484 | 8-2 | 78/90 | Limited to Average | 94 (89-98) | 94 | 33 |
| Sentence Reading Fluency | 461 | 8-3 | 45/90 | Limited | 92 (85-99) | 92 | 29 |

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POSITION VS. PROFICIENCY

Standard score statement: The student's Reading Fluency standard score is in the average range (standard score 92, percentile rank 29).

Proficiency statement: The student's Reading Fluency skills are limited. They will likely find reading grade level texts accurately and automatically very difficult.



Score Report

Name: Javle, S
Date of Birth: 11/11/2009
Age: 5 years, 9 months
Sex: Female
Date of Testing: 08/18/2015

School:
Teacher:
ID:
Examiner: Tammy Stephens, Ph.D.

TESTS ADMINISTERED
 Woodcock-Johnson IV Tests of Early Cognitive and Academic Development



TABLE OF SCORES
 Woodcock-Johnson IV Tests of Early Cognitive and Academic Development (Norms based on age 5-9)

| CLUSTER/Test | W | AE | RPI | Proficiency | SS (68% Band) | PR (68% Band) |
|----------------------------|-----|------|--------|---------------------|---------------|---------------|
| GIA-EARLY DEVELOPMENT | 478 | 6-5 | 95/90 | Average | 110 (106-113) | 74 (67-80) |
| EXPRESSIVE LANGUAGE | 476 | 6-8 | 96/90 | Average to Advanced | 109 (104-113) | 72 (61-81) |
| EARLY ACADEMIC SKILLS | 468 | 7-8 | 100/90 | Very Advanced | 130 (128-132) | 98 (97-98) |
| Memory for Names | 474 | 4-3 | 77/90 | Limited to Average | 91 (87-95) | 27 (20-36) |
| Sound Blending | 477 | 5-10 | 92/90 | Average | 102 (96-107) | 54 (40-68) |
| Picture Vocabulary | 481 | 7-0 | 96/90 | Average to Advanced | 111 (105-117) | 77 (63-87) |
| Verbal Analogies | 478 | 6-10 | 96/90 | Average to Advanced | 113 (106-121) | 81 (66-92) |
| Visual Closure | 468 | 5-2 | 83/90 | Average | 95 (89-100) | 36 (24-49) |
| Sentence Repetition | 470 | 6-4 | 95/90 | Average to Advanced | 105 (100-110) | 63 (51-74) |
| Rapid Picture Naming | 494 | 8-8 | 100/90 | Advanced | 120 (115-125) | 91 (84-95) |
| Letter-Word Identification | 459 | 7-5 | 100/90 | Very Advanced | 125 (123-127) | 95 (93-96) |
| Number Sense | 471 | 7-5 | 99/90 | Advanced | 125 (119-132) | 95 (89-98) |
| Writing | 475 | 8-2 | 100/90 | Very Advanced | 135 (131-138) | 99 (98->99) |

Describing RPI Scores in the Report



Sam's RPI of 21/90 on the *Fluidez en la lectura* cluster indicates that on similar tasks, in which the average fourth-grade student would demonstrate 90 percent proficiency, Sam would demonstrate 21 percent proficiency. Sam's prosody, automaticity, and accuracy is very limited.

Nicholas's standard score on the Mathematics Reasoning cluster was within the average range for seventh-grade students overall. His RPI (45/90) indicates that he will have considerably more difficulty than most of his grade-peers in math problem solving.



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Summary

- Norm-referenced tests provide us with a variety of scores to consider when interpreting student performance
- There are differences between position and proficiency
- Standard scores should not be used to compare/measure student academic growth
- The RPI score should be considered when interpreting student performance and implications on learning
- RPI scores provide a richer understanding of the learning and can assist in driving instructional programming

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