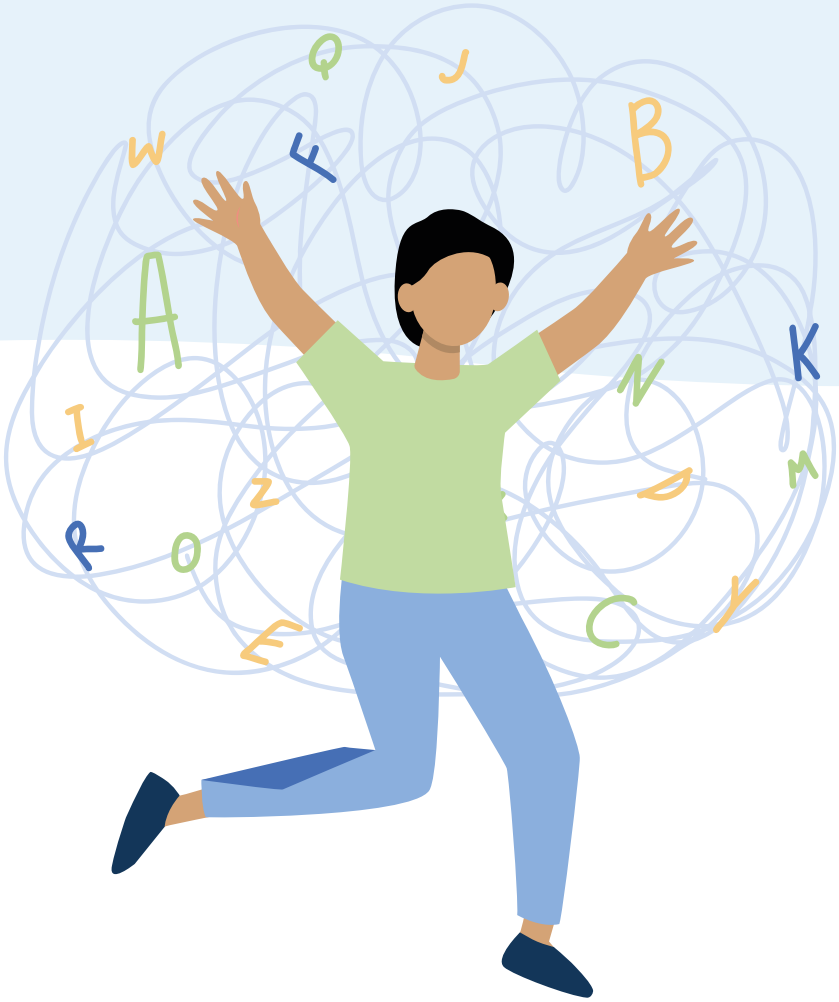
Riverside Insights

Assessment Plan

A Comprehensive Guide to Evaluating Dyslexia in Ages 7+



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Assessment Plan: A Comprehensive Guide to Evaluating Dyslexia in Ages 7+

According to the International Dyslexia Association (IDA, 2002)[1],

> *"Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge."*

Riverside Insights® offers powerful tools in the assessment of Dyslexia, allowing examiners to assess various latent and applied abilities pertinent to reading and spelling achievement throughout the lifespan. The conceptual framework outlined in the Use of the Woodcock-Johnson IV for the Assessment of Dyslexia Assessment Service Bulletin (Proctor et al., 2015)[2] was used in the creation of this guide. Information regarding the individual tests and clusters was sourced from each instrument's respective Examiner's Manual. Note that results from formal tests should always be verified by other sources of data to ensure ecological validity.

Dyslexia 7+ Bundle	
Comprehensive Measures (Pages 3-18)	**Selective Measures (Pages 19 -22)**
WJ IV COG	TONI-4
WJ IV ACH	Test of Word Reading Efficiency, Second Edition
WJ IV OL	Nelson-Denny Reading Test
GORT-5	TAPS-4
CTOPP-2	-
Letter & Sound Assessment	-

[1] About Dyslexia, International Dyslexia Association, https://www.idaontario.com/about-dyslexia/

[2] Proctor, C.M., Mather, N., & Stephens, T.L. (2015). Use of the Woodcock-Johnson IV for the Assessment of Dyslexia (Woodcock-Johnson IV Assessment Service Bulletin No. 6). Rolling Meadows, IL: Riverside Publishing.

Comprehensive Measures

WOODCOCK-JOHNSON IV TESTS OF COGNITIVE ABILITIES (WJ IV COG®)

The **WJ IV COG** allows for an assessment of underlying cognitive abilities that can influence reading and spelling development as well as measures to determine an individual's performance in the absence of the requirement to read. These abilities are listed below by domain with their associated tests in accordance with Proctor et al.'s (2015) framework for evaluating Dyslexia via the ***WJ IV Suite of Assessments®.***

Cognitive correlates to reading and spelling skills assessed by the WJ IV COG include phonological awareness, orthographic awareness, memory, and processing speed.

- Reading and spelling success is dependent upon an individual's ability to perceive and manipulate speech sounds associated with text. Weaknesses in phonological awareness can manifest as difficulties with word recognition, word decoding, and spelling. The Auditory Processing cluster of the WJ IV COG taps this area of functioning.
  - Phonological Processing is a complex measure of auditory processing, which also tests speed of lexical access. It is a three-part task:
    - ***Word Access*** requires the examinee to provide a word that has a specific phonemic element in a given location.
    - ***Word Fluency*** taps speed of lexical access, as the examinee is provided one minute to name as many words as they can that begin with a target sound.
    - ***Substitution*** tasks the examinee with substituting part of a word to create a new word.
  - Nonword Repetition taps phonological short-term memory. It requires the examinee to listen to a nonreal word and repeat the word exactly as it was presented.
- Orthographic awareness requires the ability to decode and encode printed symbols (e.g., letters, letter patterns, numbers, punctuation). Orthographic awareness is tapped by Letter-Pattern Matching and Number-Pattern Matching. Both are measures of perceptual speed, which fall under the domain of processing speed.
  - Letter-Pattern Matching demands that the examinee work quickly and accurately when locating identical letter patterns amongst distractors.
  - Number-Pattern Matching also demands the examinee to work efficiently, while searching for identical numbers amongst distractors.

- According to Mather & Wendling (2012)[3] , memory span and **Short-Term Working Memory** are integral to the development of reading skills. The WJ IV COG allows for an assessment of Auditory Memory Span and Short-Term Working Memory. Working memory involves the ability to hold information in immediate awareness while manipulating or transforming the information in some fashion. Short-term working memory lends itself to reading development and achievement. For example, in the service of reading comprehension, one's working memory can support the retention of the important elements of a text needed to understand and answer questions pertaining to it.
  - **Memory for Words** tests short-term auditory working memory span, by demanding the examinee to repeat lists of unrelated words in a target sequence.
  - **Verbal Attention** is a measure of short-term working memory, demanding attentional control. The examinee is asked to listen to a mixed series of animals and digits, and then answer a specific question regarding the presented sequence. For example, "Tell me number between moose and horse."
  - **Numbers Reversed** also assesses short-term working memory, as the examinee is asked to hold a sequence of numbers in their immediate awareness, prior to reversing the sequence.
  - Examiners can also choose to administer **Object-Number Sequencing**, to derive an extended version of the Short-Term Working Memory cluster. ***Extended clusters require utilization of the WJ IV COG's extended battery.*** Object-Number Sequencing demands that the examinee hold digits and words in their immediate awareness, divide the information into two groups (one group for objects, one for numbers), and sequentially order the information in those groups.

[3] Mather, N., & Wendling, B. J. (2012). Essentials of dyslexia assessment and intervention. Hoboken, N.J: J. Wiley.

- Cognitive Processing Speed can be understood as the ability to perform cognitive tasks quickly and accurately. Perceptual speed is a narrow ability within the processing speed domain, which is the ability to quickly perform simple clerical tasks that use symbols, such as matching letters or numbers. Tasks within this domain on the WJ IV COG often require sustain controlled attention and concentration and place the examinee under timed pressure. According to Mather and Wendling (2012)[4], weaknesses in these areas are directly related to complications in reading accuracy, reading rate, and higher-order functions (e.g., reading comprehension).
    - Letter-Pattern Matching is a measure of cognitive processing speed and perceptual speed, which demands the examinee to locate and circle two identical letter patterns in a row containing six possible patterns. The correct patterns are always a possible English spelling pattern, while the incorrect patterns are either impossible or less frequent strings. Performance during this test provides information regarding the examinee's ability to discriminate amongst visual symbols and identify common English spelling patterns.
    - Pair Cancellation is another measure of cognitive processing speed, which also offers information regarding executive processing (inhibition control and interference), attention, and concentration.
    - Number-Pattern Matching measures both processing speed and perceptual speed. It further taps cognitive efficiency, assessing how well an examinee discriminates amongst visual stimuli. This task demands the examinee to circle the two identical numbers in a row of six numbers.

The WJ IV COG also allows examiners to assess abilities related to learning when reading is not required. This gives the examiner the ability to determine whether performance in those areas is better developed than the individual's reading and spelling skills, and if, therefore, the underachievement in reading and spelling is unexpected in relation.

In terms of General Intelligence, the examiner has access to seven tests which contribute to an overall General Intellectual Ability (GIA) composite. According to Mather and Wendling (2014)[5], the GIA is differentially weighted to offer the best overall estimate of global intelligence. The seven tests that comprise the GIA span a breadth of cognitive functions including comprehensive knowledge, fluid reasoning, short-term working memory, cognitive processing speed, auditory processing, long-term retrieval, and visual processing. According to Proctor et al. (2015), many individuals with Dyslexia will present with strengths in Comprehension-Knowledge, Fluid Reasoning, and Visual Processing. In turn, weaknesses may be present in Short-Term Working Memory, Processing Speed, Auditory Processing, and Long-Term Retrieval.

[4] Mather, N., & Wendling, B. J. (2012). Essentials of dyslexia assessment and intervention. Hoboken, N.J: J. Wiley.

- **Oral Vocabulary** is a two-part measure of comprehension-knowledge, which requires the examinee to listen to a word and provide an appropriate word with the same or similar meaning (Synonyms), or an opposite meaning (Antonyms).
- **Number Series** is a fluid reasoning measure that taps the narrow abilities of quantitative reasoning and inductive reasoning. The examinee is presented a series of numbers with one number missing in the series. The examinee must determine the missing number that completes the series based on the information provided.
- **Story Recall** is a measure of long-term retrieval that taps meaningful memory. Examinees are asked to recall elements from increasingly complex stories that are presented auditorily.
- **Visualization** is a two-part measure tapping distinct aspects of visualization, a narrow ability of visual processing. Spatial Relations requires the examinee to identify two or three pieces that form a target shape. Block Rotation requires the examinee to review block patterns and determine which two choices match the target pattern.
- The **GIA** cognitive composite also requires administration of the following tests. These tests are described above:
  - **Verbal Attention** (described in Short-Term Working Memory)
  - **Letter-Pattern Matching** (described in Cognitive Processing Speed)
  - **Phonological Processing** (described in Auditory Processing)

The WJ IV COG also allows examiners to derive a ***Gf-Gc*** cognitive composite when evaluating for dyslexia. Unlike the GIA, which includes lower-level and less complex ability areas, the ***Gf-Gc* Composite** allows for an isolated account of the most relevant abilities in terms of their relationship to general intellectual ability, fluid reasoning and comprehension-knowledge. According to Schrank et al. (2014), when the lower-level abilities are removed, an examiner gains a better estimate of academic potential. In those with learning disabilities, inhibiting influences (e.g., slow processing speed, poor short-term working memory) may attenuate the overall GIA cognitive composite. The ***Gf-Gc* Composite is comprised of the following tests:**

- **General Information** is a two-part measure of comprehension-knowledge, tapping the depth of an individual's general information stores and knowledge. One component of this test assesses where objects typically can be found in one's environment. Another component questions what objects are typically used for. As the test progresses, target objects become less frequent in the environment.

[5] Mather, N. & Wendling, B.J. (2014). Examiner's Manual. Woodcock-Johnson IV Tests of Cognitive Abilities. Rolling Meadows, IL: Riverside Publishing.

- Concept Formation is a controlled-learning task assessing fluid reasoning. It taps inductive reasoning, categorical reasoning, and mental flexibility. The examinee is presented with complete stimulus sets and must determine the rule that governs each set.
- The *Gf-Gc* Composite also requires the following tests to be administered. Note that these tests are described above in the section outlining the GIA:
  - Oral Vocabulary
  - Number Series

The WJ IV COG further allows for an assessment of Vocabulary, an aspect of Oral Language functioning. Oral Vocabulary (a test needed to derive the GIA and ***Gf-Gc*** Composite described above) specifically measures vocabulary knowledge of spoken English. ***Note that to derive the Vocabulary cluster, examiners must also administer*** Picture Vocabulary ***from the WJ IV OL.***

With respect to academic knowledge, the WJ IV COG has a measure of General Information (described above in the tests used to derive the Gf-Gc Composite). Proctor et al. (2015) note that comprehension-knowledge (Gc) includes language-based academic knowledge.

Examiners assessing for Dyslexia may wish to consider administering the tests falling within the Scholastic Aptitude Reading clusters. According to Mather and Wendling (2014), Scholastic Aptitude clusters are based on four tests that produce the best empirical and research-based cognitive predictor for a given achievement domain. The scholastic aptitude clusters are optimal measures for assessing consistency between an examinee's aptitude in an academic domain, and their applied performance in that same domain. In the context of dyslexia assessment, examiners can choose to administer tests that best predict reading, broad reading, basic reading skills, reading comprehension, reading fluency, and reading rate. Notably, all but the basic reading skills scholastic cluster require the following tests: Oral Vocabulary, Phonological Processing, Concept Formation, and Number-Pattern Matching. The Scholastic Aptitude cluster for Basic Reading Skills requires Oral Vocabulary, Verbal Attention, Phonological Processing, and Number Pattern Matching.

Once an examiner has administered all tests of interest from the WJ IV COG, they can conduct procedures to determine the presence and significance of strengths and weaknesses in an examinee's cognitive abilities. Specifically, ***Intra-Cognitive Variations*** can be conducted to identify specific cognitive strengths and weaknesses in an examinee's profile. These variations require administration of the core WJ IV COG tests (Tests 1-7). Examiners can review the profile of strengths and weaknesses to better determine if an examinee's performances align with the characteristics of Dyslexia.

An ***Ability/Achievement Comparison*** procedure can also be conducted if the examiner has administered the core tests of the WJ IV COG, in addition to tests of interest from the WJ IV OL and/or ACH batteries. For example, examiners can conduct a ***GIA-to-Achievement Comparison*** to determine the presence and severity of a discrepancy between the GIA and any area of achievement or oral language. Note that comparison procedures can also be conducted with the ***Gf-Gc*** Composite. Additionally, examiners can conduct comparisons between scholastic aptitude and achievement clusters.

According to Proctor et al. (2015), the most applicable comparison procedures in the assessment of dyslexia are:

1. *WJ IV COG Gf-Gc Composite to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
2. *WJ IV OL Broad Oral Language cluster to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
3. *WJ IV ACH Academic Knowledge to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*

Full information regarding the possible variations and comparisons that can be conducted is provided in the ***Scores and Interpretation*** *chapter of the Examiner's Manual.*

WOODCOCK-JOHNSON TESTS OF ACHIEVEMENT, FOURTH EDITION (WJ IV ACH)

The **WJ IV ACH** can be used to assess primary and secondary reading and writing difficulties. Primary reading and spelling achievement areas include basic reading skills, reading fluency, spelling, and phoneme-grapheme knowledge (Proctor et al., 2015).

Basic Reading Skills involve identification of words that appear frequently in text (sight words), in addition to application of phonics (the application of knowledge related to sound-symbol correspondences to pronounce novel words). The WJ IV ACH has two tests which assess these aspects of functioning, respectively.

- Letter-Word Identification assesses an examinee's word identification skills. Initial items require the examinee to identify individual letters, while latter items demand the examinee to read aloud individual words. The words become less frequent in English text as the examinee progresses through the test.
- Word Attack assesses an examinee's ability to apply phonic and structural analysis to pronounce unfamiliar words that are either low frequency in English text or pseudowords.

Reading Fluency involves reading words accurately with little effort, while maintaining an appropriate rate and prosody (pattern of stress and intonation in spoken language; Proctor et al., 2015). Each component of reading fluency (at the word, syntactic, and passage levels) plays a role in higher-order reading skills (e.g., reading comprehension; Klauda & Guthrie, 2008[6]).

- Oral Reading is a measure of story reading accuracy and prosody, which requires the examinee to read text aloud that increases in difficulty. The examinee's performance is based on their accuracy and the fluency of their expression. Item scoring is based on the errors committed throughout the test, and examiners can document errors in the following categories: mispronunciations, omissions, insertions, substitutions, hesitations, repetitions, transpositions, and ignoring punctuation.
- Sentence Reading Fluency assesses reading rate and processing speed capabilities. Examinees are required to read simple statements under timed conditions and decide whether each statement is true or false. Upon determining the validity of each statement, the examinee must circle Yes or No.

[6] Klauda, S. L., & Guthrie, J. T. (2008). Relationships of three components of reading fluency to reading comprehension. Journal of Educational psychology, 100(2), 310-321.

Reading Rate, a component of ***reading fluency***, is also measurable via the WJ IV ACH.

- As noted above Sentence Reading Fluency assesses reading rate.
- Word Reading Fluency is another test of reading rate, which measures vocabulary knowledge and semantic fluency. Processing speed also is tapped by this task, as the examinee works under time constraints. The examinee is required to mark the two words in a row that share some relationship (e.g., synonyms/antonyms, within similar semantic category).

According to Proctor et al. (2015), Spelling requires application of similar skills when compared to reading (phoneme-grapheme knowledge and knowledge regarding orthography). The process of spelling a word requires an individual to break the word into its constituent sounds, retrieve from memory the appropriate symbol (grapheme) that represents each sound, and then physically generate those graphemes in the appropriate sequence (Mather & Wendling, 2012). The WJ IV ACH assesses the spelling of both real and pseudowords.

- Spelling initially assesses prewriting skills (e.g., drawing lines, tracing letters), and the ability to form upper- and lowercase letters. As the tasks increases in difficulty, the examinee is then asked to spell more complex words.
- Spelling of Sounds measures phonological and orthographic coding skills. The task begins with the examinee writing individual letters that represent a single sound. As the task progresses, the examinee then is required to spell pseudowords or low-frequency words.

According to Proctor et al. (2015) a common characteristic of individuals with dyslexia is difficulty in applying phonetic knowledge when engaged in reading and spelling tasks. Phoneme-Grapheme Knowledge can be assessed by administering Word Attack (described under Basic Reading Skills) and Spelling of Sounds (described under Spelling).

Secondary academic challenges can arise because of weaknesses in the primary areas of reading and spelling. Proctor et al. (2015) note that these secondary areas of difficulty can be observed in reading comprehension and written expression.

Weaknesses in reading fluency and decoding can negatively impact reading comprehension performance. On the WJ IV ACH, the following tests can be administered to derive the Reading Comprehension cluster.

- **Passage Comprehension** assesses how well an examinee uses syntactic and semantic cues to identify a missing word in text. Initial items require the examinee to match a representation of a word with a picture of the actual object. The next set of items require the examinee to read a phrase and point to the picture which depicts the phrase. The remaining items require the examinee to identify a keyword that fits within the context of a given passage.
- **Reading Recall** assesses both reading comprehension and meaningful memory, as the examinee is tasked with silently reading a short story and retelling as much of the story they can recall.
- **Reading Vocabulary** is a two-part test tapping reading comprehension skills and comprehension-knowledge. The first part of the test, Synonyms, requires the examinee to read a word and provide an appropriate synonym. The second part, Antonyms, requires the examinee to read target words and provide a word with an opposite meaning. This test must be administered to derive the extended version of the **Reading Comprehension** cluster.

Proctor et al. (2015) report that students with dyslexia typically present with the highest performance on **Reading Recall** (longer passages), then **Passage Comprehension** (sentences), and lastly **Reading Vocabulary** (individual words). They further report that performances on these tests generally are higher than on measures of basic reading skills and reading rate.

Written Expression demands intact phoneme-grapheme knowledge and spelling skills. Observed written expression deficits may result from the weaknesses in these primary areas. Deficits in phoneme-grapheme knowledge and spelling can impact an examinee's automaticity and clarity when writing longer prose. Written expression is tapped by the following tests:

- **Writing Samples** assesses the ability to write text in response to a variety of prompts. An examinee's generated text is reviewed based on the quality of their expression. The difficulty of this task increases as a function of passage length, vocabulary level, and complexity of the content. There is no penalization for errors in spelling, punctuation, or other basic writing skills, which often are challenging for individuals with dyslexia.
- **Sentence Writing Fluency** measures an examinee's ability to formulate and write simple sentences quickly and accurately.

According to Proctor et al. (2015), across the writing tests noted, those with dyslexia tend to perform the best on Writing Samples, followed by Sentence Writing Fluency, Spelling, and Spelling of Sounds.

Examiners utilizing the WJ IV ACH can also assess possible cognitive contributing factors in their evaluation of dyslexia. Specifically, the WJ IV ACH allows for a review of Orthographic Awareness. Orthographic awareness requires the ability to decode and encode printed symbols (e.g., letters, letter patterns, numbers, punctuation). This domain is assessed via the following tests:

- Spelling (discussed in Spelling)
- Word Attack (discussed in Basic Reading Skills)
- Spelling of Sounds (discussed in Spelling)

The WJ IV ACH further allows for an assessment of abilities to learn independent of reading. Proctor et al. (2015) note that a "hallmark of dyslexia is that the primary and secondary characteristics and related cognitive ability weaknesses are unexpected" when compared to the abilities to learn independent of reading. On the WJ IV ACH, domains falling under this independent category include ***Math*** and ***Academic Knowledge***.

Within the domain of Math, examiners can review Math Calculation Skills and Math Problem Solving.

Math Calculation Skills tests include:

- Calculation tests an examinee's ability to perform a range of mathematical computations ranging from basic operations to more advanced operations (e.g., geometry, trigonometry, calculus). The calculations also test knowledge of specific concepts (e.g., negative numbers, percentages, fractions, whole numbers).
- Math Facts Fluency is a speeded measure requiring the examinee to solve basic addition, subtraction, and multiplication facts.

Math Problem Solving is measured by administering the following tests:

- Applied Problems tasks the examinee with analyzing and solving math problems. The examinee is required to listen to a problem, determine the appropriate procedure to solve the problem, and then execute that procedure. Items on this test can include extraneous information that require the examinee to determine the appropriate information needed to solve each question.
- Number Matrices taps quantitative knowledge and fluid reasoning. The examinee is shown matrices and must identify the missing number.

Academic Knowledge is comprised of three tests from the WJ IV ACH's Extended Battery, which offers a broad sampling of an examinee's breath of knowledge across the domains of Science, Social Studies, and the Humanities. Data garnered from these tests can be used to compare whether an examinee's stores of acquired knowledge align with their tested achievement levels in reading, writing, and mathematics.

- **Science** assesses an individual's knowledge across a broad range of scientific subjects including anatomy, biology, chemistry, geology, medicine, and physics.
- **Social Studies** tests the breadth of an individual's knowledge related to history, economics, geography, government, and psychology.
- **Humanities** assesses knowledge of art, music, and literature.

Once an examiner has administered all tests of interest from the WJ IV ACH, they can conduct ***Intra-Achievement Variations*** procedures to determine the presence and significance of strengths and weaknesses across the domains of reading, writing, and mathematical achievement. These variations require administration of the core WJ IV ACH tests (Tests 1-6). Variations allow examiners to better determine if an examinee's profile of strengths and weaknesses aligns with the characteristics of dyslexia.

Examiners can also conduct ***Academic Skills/Academic Fluency/Academic Application Variations***, which allow the comparison of an examinee's performance in skills, fluency, and applications across the areas of reading, writing, and math. Note that to review Academic Fluency in a variation, Tests 9-11 must be administered. These variations can be useful in determining a need for accommodations or modifications to instruction (Proctor et al., 2015). Proctor et al. (2015) note that many individuals with dyslexia present with more developed performances within the ***Academic Applications*** cluster when compared to ***Academic Skills*** and ***Academic Fluency***.

Examiners can also conduct Comparison procedures, which use one score to predict an examinee's performance in another domain. According to Proctor et al. (2015), the three most applicable comparison procedures are:

1. *WJ IV COG Gf-Gc Composite to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
2. *WJ IV OL Broad Oral Language cluster to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
3. *WJ IV ACH Academic Knowledge to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*

Full information regarding the possible range of variations and comparisons that can be conducted is provided in the ***Scores and Interpretation*** *chapter of the Examiner's Manual.*

WOODCOCK-JOHNSON TESTS OF ORAL LANGUAGE, FOURTH EDITION (WJ IV OL)

The **WJ IV OL** allows for further assessment of possible contributing cognitive factors in the assessment of dyslexia, including phonological awareness, memory, and rapid naming.

Within the domain of phonological awareness, the WJ IV OL offers three tests which assess **Phonetic Coding** (i.e., the ability to hear phonemes distinctly). This skill is crucial in the assessment of reading achievement, as those with poor phonetic coding may have difficulty perceiving the internal sound structure of words.

- **Segmentation** is an auditory processing test which measures an examinee's skill in breaking apart the speech sounds in words. The examinee is tasked with listening to words and identifying target word parts ranging from compound words to syllables to individual speech sounds.
- **Sound Blending** also is an auditory processing test, which determines an examinee's ability to synthesize speech sounds.
- **Sound Awareness** is comprised of two subtests, Rhyming and Deletion. Rhyming requires the examinee to identify words which rhyme with target words. Deletion requires the examinee to delete word parts and phonemes from orally presented words.

The WJ IV OL includes one measure of Auditory Memory Span: Sentence Repetition.

- **Sentence Repetition** measures the ability to remember and repeat individual words, phrases, and sentences. During this task, sentence meaning can be used to aid recall. ***To derive the Auditory Memory Span cluster, examiners will also need to administer*** **Memory for Words** from the WJ IV COG battery.

The WJ IV OL also allows for an assessment of **Rapid Naming skills**. Rapid naming can be defined as the ability to recall names of familiar objects or symbols (e.g., letters and numbers) quickly and accurately. According to Proctor et al. (2015), both rapid naming tasks and reading tasks demand an individual to quickly synthesize verbal and visual information. The fluent integration of visual and verbal data, in addition to the application of attentional control, are all needed for successful reading (Neuhaus & Swank, 2002)[7]. Administration of the following tests yields the **Speed of Lexical Access** cluster, which measures how accurately and rapidly an individual can retrieve words from long-term memory.

[7] Neuhaus, G.F. & Swank, P.R. (2002). Understanding the relations between RAN letter subtest components and word reading in first-grade students. Journal of Learning Disabilities, 35, 158-174.

- **Rapid Picture Naming** is a measure of cognitive and linguistic fluency. It provides information concerning an examinee's processing speed, speed or word retrieval, and speed of lexical access (naming facility). Under timed conditions, the examinee is asked to recall the names of simple pictures.
- **Retrieval Fluency** measures speed of lexical access (naming facility) and long-term retrieval. The examinee is required to name examples from target categories (e.g., things to eat/drink) under timed conditions.

The WJ IV OL also allows examiners to assess abilities related to learning when reading is not required. This affords the examiner the ability to review whether performances in those areas are significantly higher than the individual's reading and spelling skills. In particular, examiners can assess an examinee's **Listening Comprehension** skills via two tests:

- **Oral Comprehension** is a test of oral language measuring the ability to comprehend a short audio-recorded passage, and then provide the missing word based on semantic and syntactic cues. The test progresses in difficulty from simple associations and analogies to more complex passages.
- **Understanding Directions** is also an oral language measure, which requires the examinee to listed to a sequence of audio-recorded instructions, and then follow the directions by pointing to various depicted stimuli.

Examiners can also assess **Oral Expression**, which is described as an aggregate of comprehension knowledge, including word and syntax knowledge, in addition to language development. Deriving the **Oral Expression** cluster requires administration of the following tests:

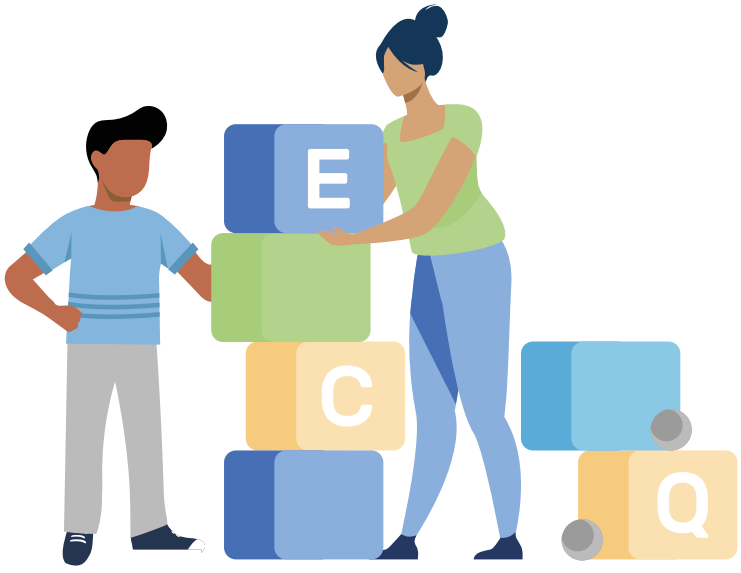
- **Picture Vocabulary** assesses oral language development and word knowledge. The examinee is required to identify objects based on presented pictures. As the task progresses in difficulty, the objects become less common within the environment.
- **Sentence Repetition**, which is described above in Auditory Memory Span.

Upon completion of test administration, examiners can conduct ***Intra-Oral Language Variations*** (given that at least Tests 1-4 have been administered). These procedures are used to determine the presence and significance of strengths and weaknesses in an examinee's oral language abilities. The WJ IV OL can also be used in ***Oral Language/Achievement Comparisons***. These procedures may yield data to support the determination of a specific academic impairment (Proctor et al., 2015).

According to Proctor et al. (2015), the most applicable comparison procedures are:

1. *WJ IV COG Gf-Gc Composite to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
2. *WJ IV OL Broad Oral Language cluster to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*
3. *WJ IV ACH Academic Knowledge to WJ IV ACH Basic Reading Skills, Phoneme-Grapheme Knowledge, and Reading Rate*

Full information regarding the possible variations and comparisons that can be conducted is provided in the ***Scores and Interpretation*** *chapter of the Examiner's Manual.*



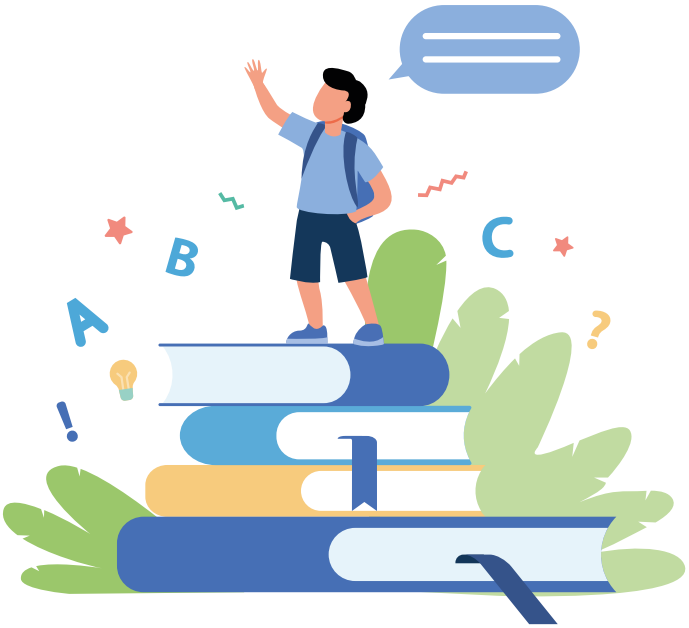
WOODCOCK-JOHNSON INTERPRETATION AND INSTRUCTIONAL INTERVENTIONS PROGRAM™ (WIIIP®)

The **WIIIP®** is an add-on subscription offering a research-based supplement that can serve as a starting point for analysis, discussion, and implementation of teaching strategy, generating personalized interventions and accommodations based on an individual's WJ IV and ECAD (Early Cognitive and Academic Development) results.

It includes checklists that can be synthesized into a Comprehensive Report. Checklists include Reason for Referral, Parent's Checklist: School Age, Teacher's Checklist: School Age, Parent's Checklist: Preschool Age, Teacher's Checklist: Preschool Age, Classroom Behavior Observation Form, Self-Report Checklist: Adolescent/Adult, and a Writing Evaluation Scale. Evidenced-based and formative interventions also can be integrated into comprehensive reports from an interventions bank that is included with a WIIIP subscription. Suggested interventions are based on an examinee's performance across assessed domains.

Of interest to dyslexia assessment, the WIIIP also offers a Dyslexia Report. The report is based on the conceptual framework offered by Proctor et al. (2015). In addition to this reporting option, the WIIIP also offers Dyslexia specific checklists that can be synthesized into the report for interpretation purposes.

Additional information regarding the WIIIP can be viewed in the Overview of the WJ IV Interpretation and Instructional Interventions Program- Assessment Service Bulletin No. 5 and in our WIIIP Overview PowerPoint.



GRAY ORAL READING TEST- FIFTH EDITION (GORT-5)

The **GORT-5** allows examiners to engage in targeted assessment of reading fluency (reading rate + reading accuracy), a primary reading achievement area in the assessment of Dyslexia. Examiners also can test reading comprehension, a secondary reading achievement area in a Dyslexia evaluation.

Administration of the GORT-5 yields scores in the following areas:

- Rate is determined by the number of seconds a student takes to read a story aloud.
- Accuracy is derived from the number of words the student reads correctly while reading a passage aloud.
- Fluency is computed as a combination of a student's rate and accuracy on the stories administered.
- Comprehension is tapped via questions about each story that the student answers correctly. Note that the examinee is not permitted to re-read the story when answering the comprehension questions.
- An Oral Reading Index can be derived as a composite score, which is comprised of an examinee's fluency and comprehension scores. It serves as a measure of total oral reading ability.

In addition to the scores noted above, the GORT-5 allows for a miscue analysis. This allows examiners to analyze reading errors and tailor interventions to the specific needs of their examinee. The GORT-5 further permits an informal review of an examinee's prosody, the patterns of stress and intonation while speaking. Examinees are rated on a scale of 1 to 4 in the areas of expression, volume, phrasing, smoothness, and pacing.

COMPREHENSIVE TEST OF PHONOLOGICAL PROCESSING, SECOND EDITION (CTOPP-2)

The **CTOPP-2** is designed to identify individuals with phonological capabilities well below their peers and provides an analysis of strengths and weaknesses in already developed phonological processes. The CTOPP-2 is recommended for 2nd grade individuals and up as it has the most items tapping phoneme manipulation (the most highly correlated skill to reading growth for that point within the lifespan). The CTOPP-2 is comprised of 12 subtests which tap relevant cognitive functioning which underlie reading and spelling weaknesses:

- **Elision** tests the ability to omit phonological segments from spoken words to form another word.
- **Blending Words** tests how well an examinee can combine phonological segments to form words.
- **Sound Matching** requires the examinee to identify words that have the same beginning and ending sounds.
- **Phoneme Isolation** measures the ability to isolate individual sounds within words.
- **Blending Nonwords** tests the ability to combine sounds to create pseudowords.
- **Segmenting Nonwords** involves breaking pseudowords into their constituent phonemes.
- **Memory for Digits** tests how accurately an examinee can repeat numbers.
- **Nonword Repetition** measures the ability to repeat pseudowords.
- **Rapid Digit Naming** tests how quickly and accurately an examinee can name numbers.
- **Rapid Letter Naming** measures the ability to rapidly name letters.
- **Rapid Color Naming** tests how quickly and accurately an examinee can identify colors.
- **Rapid Object Naming** requires the examinee to rapidly name objects.

Examiners can yield five composites, which are described below:

- **Phonological Awareness** measures an examinee's awareness of and access to the phonology of the English language.
- **Phonological Memory** taps the ability to encode information phonologically for storage in working or short-term memory.
- **Rapid Symbolic Naming** tests the ability to efficiently retrieve phonological information from long-term storage and executive a series of steps quickly and accurately.
- **Rapid Non-Symbolic Naming** also tests efficient retrieval of phonological information from long-term storage and the ability to quickly and accurately executive a series of operations using objects and colors.
- The **Alternate Phonological Awareness Composite** assesses an examinee's phonological awareness skills in the context of only nonwords.

LETTER AND SOUND ASSESSMENT

The **Letter and Sound Assessment** is a measure of upper-case letter identification, lower-case letter identification, and letter-sound correspondence and is recommended as a part of a comprehensive evaluation for all elementary age students. It requires a student to name all 26 letters in the English alphabet, in both upper- and lower-case form as well as provide the sound for lower-case consonants and vowels. Atypical performance on the Letter and Sound Assessment depends on the developmental appropriateness of any errors committed. For example, if a 5- or 6-year-old commits a reversal error with letters b, d, p, q, that may be considered an expected mistake as reversals are generally regarded as being developmentally appropriate until age 7. For other letters/sounds, 2+ errors may signify atypical performance. It is also possible to divide the number incorrect by the total numbers to calculate the percentage correct. This percentage can be compared to other sources of data (e.g., curriculum benchmarks, prior letter identification assessment performance, etc.) to determine if performance is atypical in relation to established standards. ***Generally, the expectation is for students to demonstrate no errors at 7+ years of age.***

Selective Measures

Selective Testing refers to the careful selection of instruments to further assess skill areas pertinent to the referral concerns, when deemed necessary based on clinical judgment. Selective Testing allows an examiner to obtain the most diagnostic information in the least amount of testing time, for any given individual's unique needs. Selective Testing may also be conducted based on an individual's functional profile (e.g., pattern of strengths and weaknesses that emerges during testing) to provide further information that can be used for diagnostic purposes and educational program planning.

TEST OF NONVERBAL INTELLIGENCE FOURTH EDITION (TONI-4)

Many traditional measures of cognitive functioning are comprised, in part, of verbally mediated and language-loaded tasks. For individuals who have, or are suspected of, language differences or disorders, these cognitive composites may underestimate their reasoning and thinking abilities. The **TONI-4** may allow for a more accurate estimation of an individual's functioning in these cases, as it eliminates the traditional language demands placed on an examinee.

The TONI-4, is a theoretically and empirically supported measure of intelligence, aptitude, abstract reasoning, and problem-solving, designed to be used across the lifespan (ages six through 89). The TONI-4 is available in two equivalent forms that each contain 60 abstract items. Administration of the TONI-4 yields age-based standard scores, percentile ranks, and stanines for interpretative purposes. Mode of administration is simple and low in linguistic demands as there are minimal oral directions, and the examinee is permitted to respond with gestures (pointing, nodding, or blinking). Given its low linguistic and motor demands, the TONI-4 can serve as an effective assessment for examinees with linguistic, auditory, and motoric deficits. Furthermore, the TONI-4 is not a culturally loaded measure of intelligence, which allows it to serve as an appropriate assessment for examinees that have limited experience with mainstream American culture. Users working with linguistically diverse populations can also utilize the TONI-4, as prompts and directives are available in multiple languages.

TEST OF WORD READING EFFICIENCY- SECOND EDITION (TOWRE-2)

The **TOWRE-2** is a quick-to-administer measure of sight word and phonemic decoding efficiency designed for those six through 24 years of age. Furthermore, the TOWRE-2 can serve as a core or supplemental assessment within a larger test battery tailored to diagnose reading disabilities. The TOWRE-2 consists of two timed subtests, Sight Word Efficiency and Phonemic Decoding Efficiency. Both subtests yield standard scores and percentile ranks.

- Sight Word Efficiency assesses the number of real words an examinee can correctly read within 45 seconds.
- Phonemic Decoding Efficiency measures the number of nonwords (pseudowords) an examinee can decode within 45 seconds.

NELSON-DENNY READING TEST (NDRT)

The **NDRT** is a standardized and normative measure of reading vocabulary, comprehension, and reading rate specially designed to help examiners determine appropriate placement for high school and college populations. As such, it may be an appropriate supplement to those evaluations involving older students, including those who may be transitioning to post-secondary educational settings who require documentation of current reading achievement levels.

The NDRT is comprised of two core subtests, Vocabulary and Comprehension.

- Vocabulary presents examinees with an opening statement and five response options. For example, “A pilot operates a: A) Plane, B) Car, C) Bus, D) Train, E) Boat. The examinee is tasked with selecting the option that best completes the opening statement.
- Comprehension consists of seven reading passages and a total of 36 comprehension questions each with five possible responses. The passages are culled from textbooks humanities, science, and social sciences, and the comprehension questions were designed to be passage dependent (I.e., accurate responses to the items requires examinees to read the passages prior to responding). Examinees are asked to read as many passages and answer as many questions as they can under timed conditions.

The NDRT also contains an optional subtest, Reading Rate.

- Reading Rate is obtained by asking the examinee to mark in the margin of the test record the number that corresponds to the last sentence they read in Passage 1 of the Comprehension subtest after exactly one minute elapsed. Note that students are instructed to read at their normal rate during the NDRT.

The NDRT yields grade and age equivalent scores, percentile ranges, subtest index scores (measured as standard scores), in addition to a General Reading Ability composite.

- The General Reading Ability composite is derived by combining the Vocabulary and Comprehension subtests to generate an index of overall reading ability.

TAPS-4

The **TAPS-4** is a language processing skills assessment designed for ages five through 21 years of age. Administration of the TAPS-4 allows users to target language processing and comprehension skills across 11 subtests that fall within the TAPS-4's phonological processing, auditory memory, and listening comprehension composites.

The TAPS-4 affords examiners the ability to analyze a full range of language processes and identify strengths and weaknesses that can be used to further justify the "expected" or "unexpectedness" of an individual's reading and spelling skills. Unique to this bundle is the TAPS-4's Listening Comprehension Composite which contains two tests that help examiners discern how well an examinee can process connected speech in quiet (Processing Oral Directions) versus noisy environments (Auditory Figure Ground). The latter test is particularly useful for examiners who are seeking a better ecological estimate of an examinee's auditory processing skills. Subtest scores are reported as scaled scores, whereas the composites are reported as standard scores.

Phonological Processing Composite:

- Word (Pair) Discrimination assesses the ability to discriminate whether a given word pair is the same or different.
- Phonological Deletion tests the ability to manipulate phonemes in words by removing specific speech sounds within the word to create new words.
- Phonological Blending taps the ability to synthesize a word when provided phonemes.
- Syllabic Blending (Supplemental) tests the ability to blend syllables to form a pseudoword.

Auditory Memory Composite:

- **Number Memory Forward** tests the ability to recall an auditorily-presented number string as presented.
- **Word Memory** demands the ability to recall an auditorily-presented sequence of words in the presented order.
- **Sentence Memory** taps the ability to recall a sentence that was spoken aloud.
- **Number Memory Reversed (Supplemental)** tests the ability to hold a sequence of numbers in awareness and then restate the sequence in reverse order.

Listening Comprehension Composite:

- **Processing Oral Directions** taps the ability to process and recall oral directions when instructions are provided in quiet listening conditions.
- **Auditory Comprehension** assesses the ability to comprehend oral language at the sentence and narrative level. Task demands involve literal recall, inference, in addition to understanding idioms and figurative language.
- **Auditory Figure-Ground (Supplemental)** tests the ability to process and recall oral directions when they are presented with competing background noise.