

## Using the WJ IV Cognitive, Oral Language, and Achievement Tests in Research



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## Woodcock Institute Mission Statement

### About the Woodcock Institute

- The Woodcock Institute for the Advancement of Neurocognitive Research and Applied Practice (aka Woodcock Institute) is committed to the interdisciplinary advancement of contemporary cognitive assessment and applying evidence-based research to clinical practice.

### What we support

- interdisciplinary research into the cognitive profiles of individuals with diagnosed exceptionalities (learning disabilities, neuropsychological conditions, behavioral and psychiatric disorders, and giftedness),
- the advancement of effective clinical assessment practices and the dissemination of research findings through direct professional development opportunities and publications and applied evidence-based assessment.

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## Woodcock Institute Research Grant Applications

- <http://www.twu.edu/woodcock-institute/research-grant-application/>
- It is typically expected that grant applications to the Woodcock Institute include some dependent measures from the WJ family of products as part of their research.

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## Grant Budget Components

The award must be used to support expenses that are directly related to the research (e.g., computer time, equipment, testing materials, participant fees, incentives, graduate research assistant salary/wages plus fringe benefits); it may not be used for indirect costs, tuition, or personal expenses. Be sure to justify all expenses and detail any additional funds that will be used for the project. If the budget for the project exceeds the amount available from the award, you should describe the source of the additional funds.

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## Possible Fundable Research Projects

- Effects of evidence-based interventions on cognitive processing or academic achievement.
- Differential cognitive, oral language, or academic achievement profiles based on a specific clinical or special group.
- Advancement of intelligence theory through statistical analysis of standardization sample data.
- Neuroimaging during concurrent administration of WJ tests.

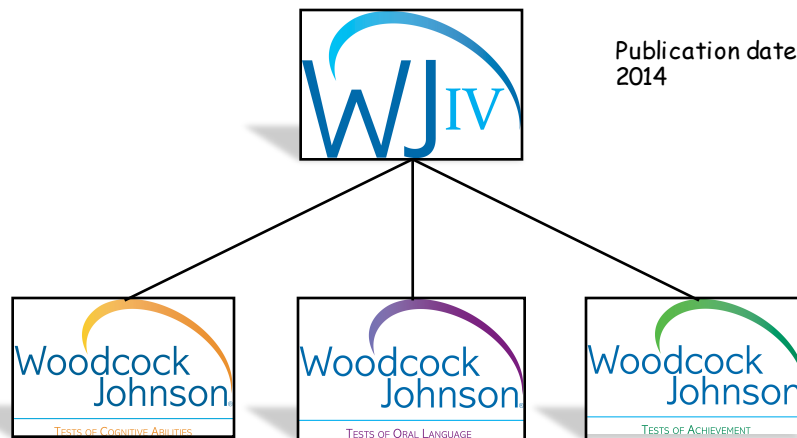
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## Obtaining the WJ Tests

- Houghton-Mifflin-Harcourt (HMH) is the publisher for the WJ-IV
  - <http://www.hmhco.com/classroom/professional-and-school-resources/assessment-professionals/assessment-suites/wj-iv-shop-now>
- Pearson Assessment is the publisher for the Woodcock Reading Mastery Tests - Third Edition (2011)
  - <http://www.pearsonclinical.com/education/products/100000264/woodcock-reading-mastery-tests-third-edition-wrmt-iii.html>

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## The WJ IV: Introduction and Overview



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## WJ IV - What's New?

### WJ IV Tests of Cognitive Abilities:

- Five new or revised tests.
- New *Gf-Gc* Composite
- New intra-cognitive variation procedure for identifying cognitive strengths and weaknesses.
- Introduction of the idea of **cognitive complexity**.

### WJ IV Tests of Oral Language:

- New battery which allows for cognitive and achievement comparisons.
- Yields a measure of Cognitive-Academic Language Proficiency (CALP)
- English and Spanish tests.

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## WJ IV - What's New?

### WJ IV Tests of Achievement

- Three parallel forms.
- New 2 test Reading, Math, and Written Language clusters.
- Seven new tests.
- Qualitative checklists about test performance

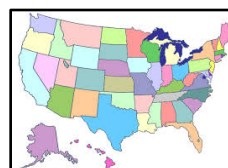
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## National Norm Sample

- 7,416 participants
  - Preschool (664)
  - K-12 (3,891)
  - College/University (775)
  - Adult (2,086)
- Ages 2-90+ years, Grades K.0-18.0
- 100 geographically diverse communities from 46 states and the District of Columbia.
- The **Standards for Educational and Psychological Testing** (aka., the Joint Standards) (American Psychological Association, American Educational Research Association, & National Council on Measurement in Education, 1999; in press) guided the norming and technical analyses.



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## Three independent (complementary) batteries that can be used for greater assessment flexibility

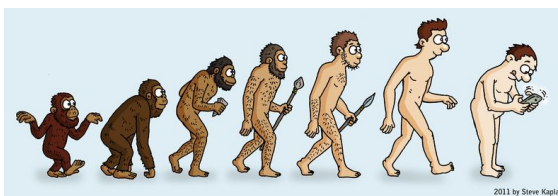
- Recognize the importance of oral language or linguistic abilities as essential correlates of cognitive and academic functioning.
- Provide an overall index of oral language ability in Spanish as well as in English with a practical option for administering the Spanish tests.
  - English and Spanish Oral Language/Ach discrepancy comparisons.
- Provide three parallel forms of the standard battery of the WJ IV ACH to avoid over-exposure to items on any given form.

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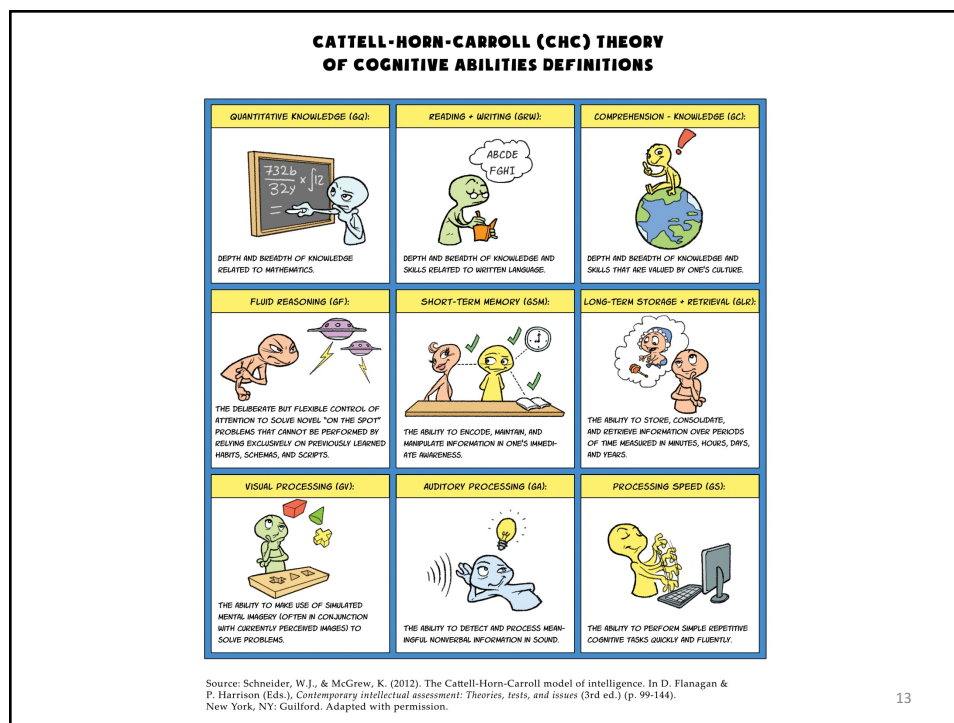
## Evolution of CHC Theory in the WJ IV



WJ (1977):	Scientific-Empirical (pragmatic)
WJ-R (1989):	Extended Cattell-Horn <i>Gf-Gc</i> Theory
WJ III (2001):	CHC Theory
WJ IV (2014):	Beyond CHC Theory

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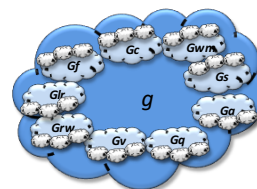


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## The CHC taxonomy of cognitive abilities codebook (Schneider & McGrew, 2012)

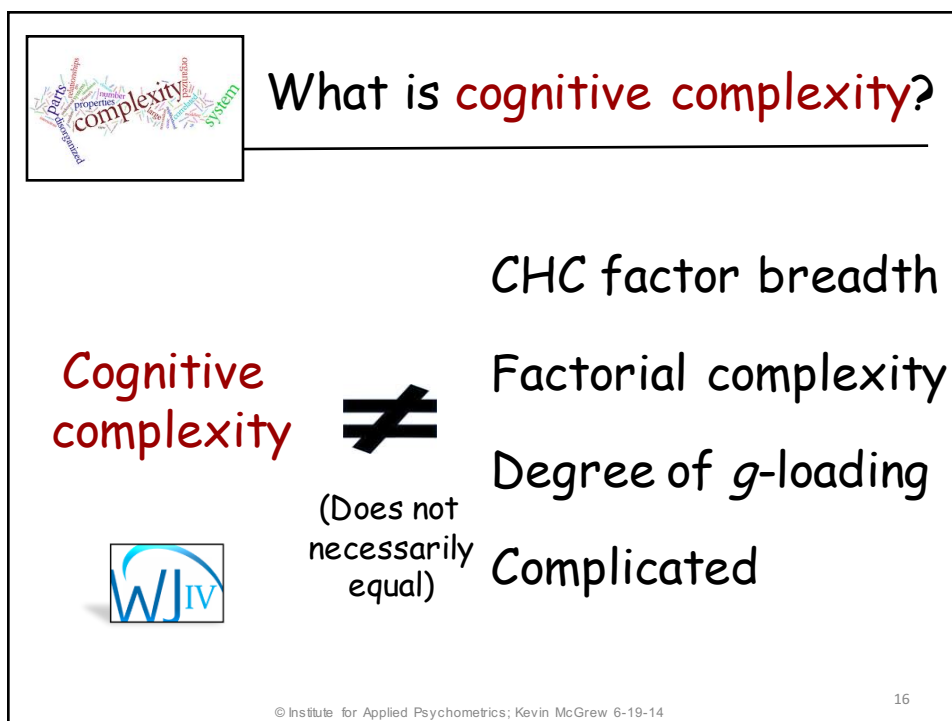
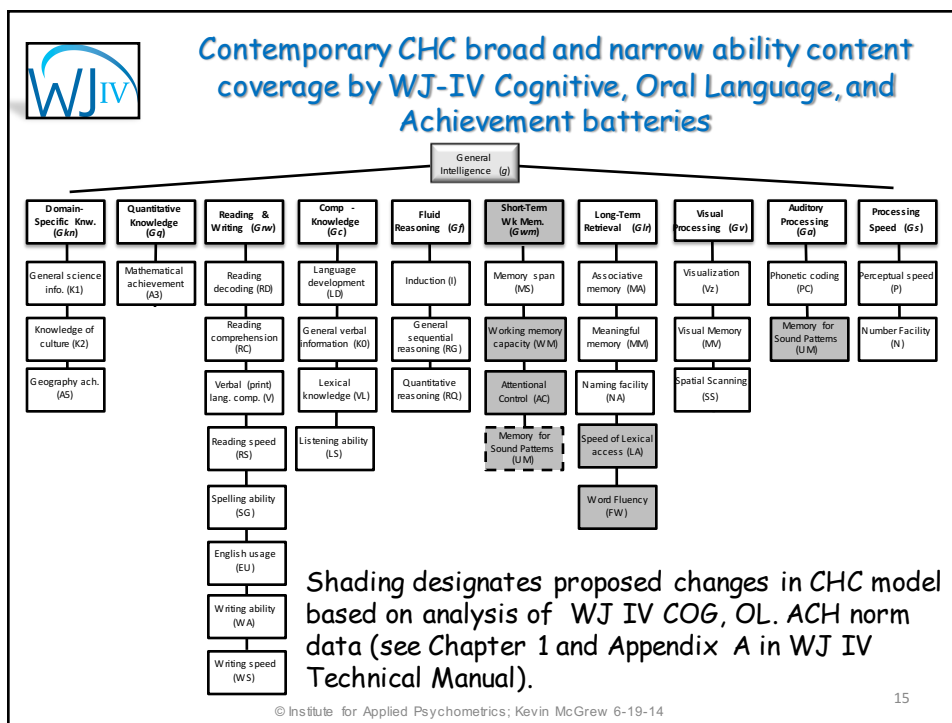
- <http://www.iapsych.com/chccodebook2.pdf>

Or visit:



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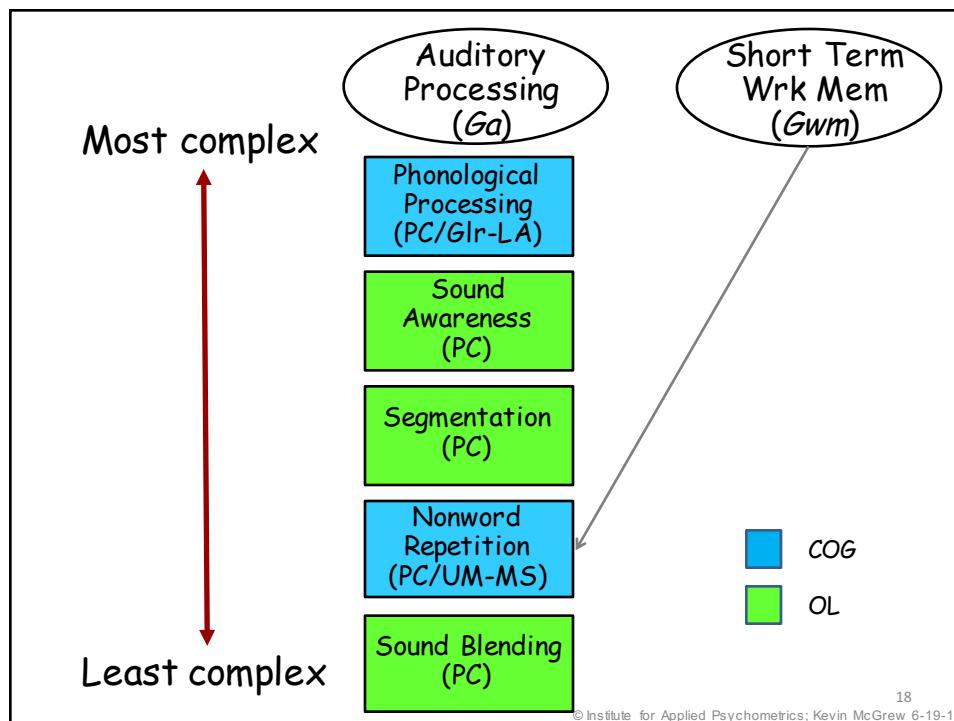
## Cognitively complex design characteristics (Lohman & Lakin, 2011)

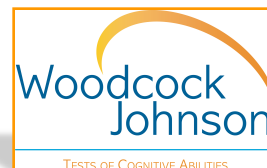
Parameters  
of cognitive  
efficiency  
in info.  
proc.  
models

- Larger number of cognitive component processes (**factorial complexity**).
- Accumulation of **speed or fluency** component differences.
- **Increased demands of attentional control (AC) & working memory.**
- More demands on **adaptive functions** (assembly, control, and monitoring - **executive functions**).
- More **important component** processes (e.g., inference; education of relations).

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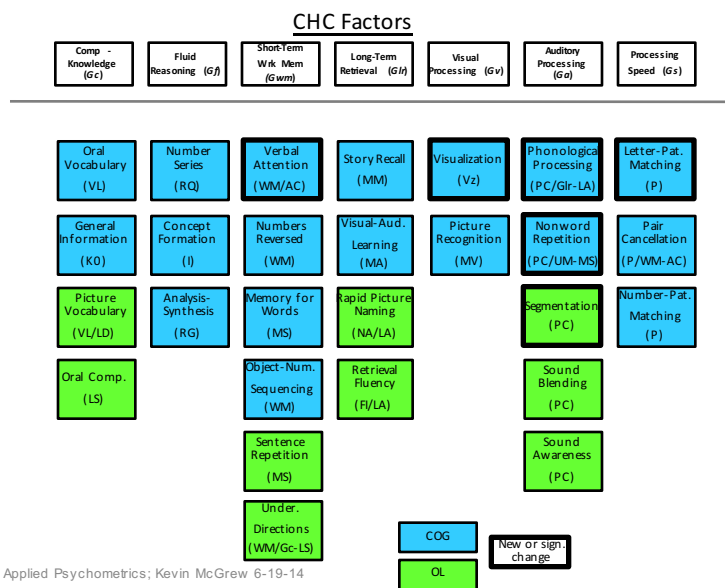





## WJ IV TESTS OF COGNITIVE ABILITIES & ORAL LANGUAGE

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### WJ IV COG and OL tests by CHC factor domains




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WJ IV Tests of Cognitive Abilities Selective Testing Table																		
Table 2-1. WJ IV COG Selective Testing Table																		
 TESTS OF COGNITIVE ABILITIES			Cognitive Composites		CHC Factors						Narrow Ability and Other Clinical Clusters							
			General Intellectual Ability (GIA)	Brief Intellectual Ability	GF-Gc Composite	Comprehension-Knowledge (Gc)	Fluid Reasoning (Gf)	Short-Term Working Memory (Gwm)	Cognitive Processing Speed (Gs)	Auditory Processing (Ga)	Long-Term Retrieval (Gr)	Visual Processing (Gv)	Quantitative Reasoning (Gq)	Auditory Memory Span (M <sub>s</sub> )	Number Facility (N)	Perceptual Speed (P)	Vocabulary (V/LD)	Cognitive Efficiency
Standard Easel	COG-01	Oral Vocabulary	■	■	■	■												
	COG-02	Number Series	■	■	■		■						■					
	COG-03	Verbal Attention	■	■	■			■										□
	COG-04	Letter-Pattern Matching	■	■	■				■								■	
	COG-05	Phonological Processing	■	■	■					■								■
	COG-06	Story Recall	■	■	■						■							
	COG-07	Visualization	■	■	■							■						
	COG-08	General Information	■	■	■													
	COG-09	Concept Formation	■	■	■													
	COG-10	Numbers Reversed	■	■	■				■							■		■
Extended Easel	COG-11	Number-Pattern Matching													■	■		□
	COG-12	Nonword Repetition																
	COG-13	Visual-Auditory Learning																
	COG-14	Picture Recognition																
	COG-15	Analysis-Synthesis					□						■					
	COG-16	Object-Number Sequencing						□										
	COG-17	Pair Cancellation							■									
	COG-18	Memory for Words																
Other Tests	OL-01	Picture Vocabulary				□								■			■	
	OL-05	Sentence Repetition											■					

■ Tests required to create the cluster listed.  
 □ Additional tests required to create an extended version of the cluster listed.



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WJ IV Tests of Oral Language Selective Testing Table													
Table x-x. WJ IV OL Selective Testing Table													
<div> TESTS OF ORAL LANGUAGE</div>			Oral Language Clusters									OL + COG	
			Oral Language	Broad Oral Language	Oral Expression	Listening Comprehension	Phonetic Coding	Speed of Lexical Access	Language oral	Amplio lenguaje oral	Comprension auditiva	Vocabulary (V/LD)	Auditory Memory Span (MS)
Oral Language Battery	OL-01	Picture Vocabulary	■	■	■							■	
	OL-02	Oral Comprehension	■	■		■							
	OL-03	Segmentation					■						
	OL-04	Rapid Picture Naming						■					
	OL-05	Sentence Repetition			■								■
	OL-06	Understanding Directions		■		■							
	OL-07	Sound Blending					■						
	OL-08	Retrieval Fluency						■					
	OL-09	Sound Awareness											
	OL-10	Vocabulario sobre dibujos							■	■			
	OL-11	Comprensión oral								■	■		
	OL-12	Comprensión de indicaciones								■	■		
Other Tests	COG-01	Oral Vocabulary										■	
	COG-18	Memory for Words											■
■ Tests required to create the cluster listed.													

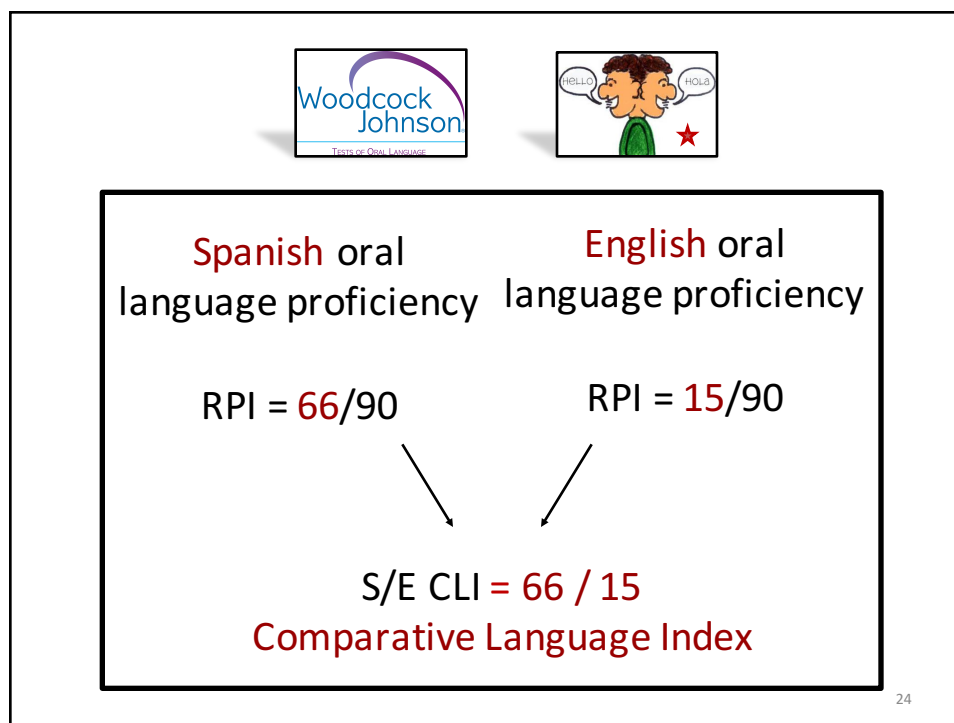
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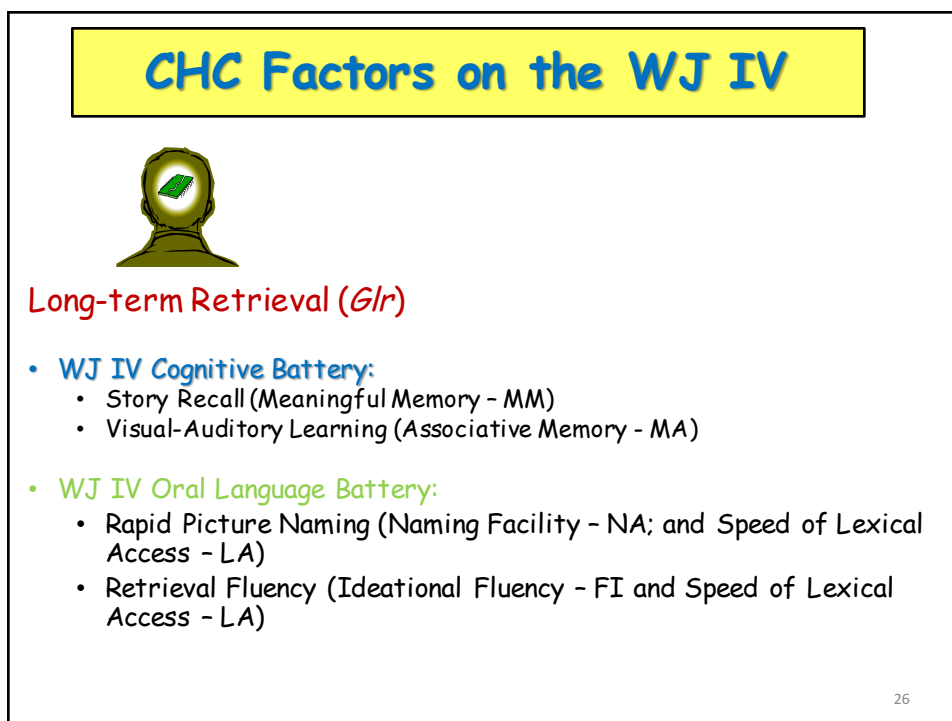
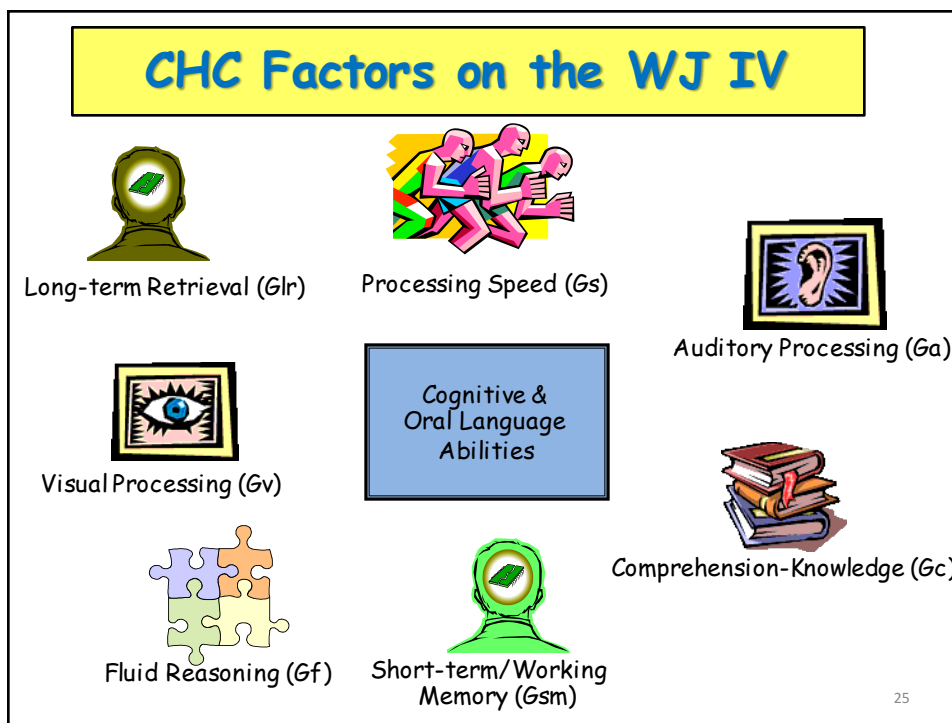



<b>Comparative Language Index</b>	
<b>English Cluster</b>	<b>Spanish Cluster</b>
<b>Oral Language</b> Test 1: Picture Vocabulary Test 2: Oral Comprehension	<b>Lenguaje oral</b> Test 10: Vocabulario sobre dibujos Test 11: Comprensión oral
<b>Broad Oral Language</b> Test 1: Picture Vocabulary Test 2: Oral Comprehension Test 6: Understanding Directions	<b>Amplio lenguaje oral</b> Test 10: Vocabulario sobre dibujos Test 11: Comprensión oral Test 12: Comprensión de indicaciones
<b>Listening Comprehension</b> Test 2: Oral Comprehension Test 6: Understanding Directions	<b>Comprensión auditiva</b> Test 11: Comprensión oral Test 12: Comprensión de indicaciones

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## Long-term Retrieval (Glr)



- **Measures** the ability to store information and fluently retrieve it later in the process of thinking.
- **Deficits indicate** difficulty in recalling relevant information and in learning and retrieving previously stored knowledge.
- **Remediations:** Needs more repetition to learn than most peers; inconsistent in remembering previously learned material.

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## Glr: Story Recall [WJ IV COG]



- Requires the child to listen to a story then recall the elements of that story.
- Both receptive and expressive language skills are required to perform this story-telling task.
- Measures linguistic competency, listening comprehension, meaningful memory, and language development.
- Limited vocabulary, limited comprehension, poor expressive language, or poor attention skills may affect performance.

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### *Glr: Visual-Auditory Learning* *[WJ IV COG]*



- Visual-Auditory Learning is a controlled learning test and loads on long-term retrieval.
- The child is asked to learn, store, and retrieve a series of visual-auditory associations (rebuses) that are eventually combined into phrases of increasing length and complexity.
- Common mistake during administration - forgetting to give corrective feedback. This is an active learning task.



= above



= below

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### *Glr: Rapid Picture Naming* *[Oral Language Battery]*



- A test of cognitive fluency that provides information about processing speed.
- This test measures a narrow ability of naming facility, or the speed of direct recall of information from acquired knowledge.
- The task requires the subject to quickly name a series of stimulus pictures (verbal fluency).
- Verbal fluency is one of the essential elements of good reading skills.

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## *Glr*: Retrieval Fluency [Oral Language Battery]



- Measures fluency of retrieval from stored knowledge.
- The subject is required to name as many examples as possible from a given category within a 1 minute time period (e.g. things to eat or drink).
- Carroll (1993) called this ability **ideational fluency**.

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## CHC Factors on the WJ IV



### Short-Term/Working Memory (*Gsm*)

#### • WJ IV Cognitive Battery:

- Verbal Attention (Working Memory Capacity - WM and Attentional Control AC) **NEW!**
- Numbers Reversed (Working Memory Capacity - WM)
- Memory for Words (Memory Span - MS)
- Object-Number Sequencing (Working Memory Capacity - WM)

#### • WJ IV Oral Language Battery:

- Sentence Repetition (Memory Span - MS)
- Understanding Directions (Working Memory Capacity - WM and *Gc* Listening Ability - LS)

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## Short-Term/Working Memory (Gsm)



- **Measures** the ability to apprehend and hold information in immediate awareness and then use it within a few seconds.
- Could be labeled as Auditory Short-term Memory.
- **Deficits indicate** difficulty in remembering just-imparted instructions or information; easily overwhelmed by complex or multistep verbal directions.

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## Gsm: Verbal Attention [WJ IV COG]



- The task requires the examinee to listen to an intermingled series of animals and digits presented on an audio recording.
- Rather than repeating the series or regrouping the items into the animals and the digits, the examinee is asked to answer a specific question regarding the sequence - for example: "Say the animal that came before the 5."

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### *Gsm: Verbal Attention* [WJ IV COG]



- Measure of *Gwm* (working memory-WM; attentional control-AC).
- More *ecological* "real world" valid measure of working memory.
- High in *cognitive complexity* and *g*. Within *Gwm*, the most *cognitively complex*, one of best indicators of *Gwm* factor, and best *predictor of achievement*.

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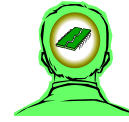
### *Gsm: Numbers Reversed* [WJ IV COG]



- A test of short-term, working memory.
- Also taps into attentional capacity.
- The test requires the individual to hold a span of numbers in immediate awareness (memory) while performing a mental operation (reversing the sequence).
- Example: Repeat these numbers back to me in reverse order - 3 - 5 - 7, is repeated as 7 - 5 - 3

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### *Gsm: Memory for Words* **[WJ IV COG]**



- Measures auditory short-term memory.
- This task asks the subject to repeat lists of unrelated words in the correct sequence.
- Repeat these words: apple - seven - table.

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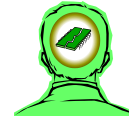
### *Gsm: Object-Number Sequencing* **[WJ IV COG]**



- Formerly called "Auditory Working Memory".
- Measures short-term memory span.
- Also classified as working memory or divided attention.
- Requires the ability to hold information in immediate awareness, divide the information into two groups, and shift attentional resources into two new-ordered sequences.
- 1 - apple - 7 - banana is recalled as: 1 - 7; apple - banana.

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### *Gsm: Sentence Repetition* *[Oral Language Battery]*



- Formerly on the WJ III Diagnostic Supplement
- Measures short-term memory span.
- Requires the ability listen and recall sentences of increasing length and complexity.

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### *Gsm: Understanding Directions* *[Oral Language Battery]*



- Requires listening to instructions and then pointing to objects in pictures.
- Measures listening ability and language development.
- Limited vocabulary, comprehension, attention, or memory span can affect performance.

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## CHC Factors on the WJ IV



### Processing Speed (*Gs*)

- WJ IV Cognitive Battery:
  - Letter-Pattern Matching (Perceptual Speed - P) **NEW!**
  - Pair Cancellation (Perceptual Speed - P, Working Memory Capacity - WM, and Attentional Control - AC).
  - Number-Pattern Matching (Perceptual Speed - P)

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### *Gs*: Processing Speed



- **Measures** the ability to perform automatically cognitive tasks, particularly when measured under pressure to maintain focused attention.
- **Deficits include:** slow in execution of easy cognitive tasks; slow acquisition of new material; tendency to become overwhelmed by complex events; need for extra time in responding even to well practiced tasks; may have difficulty making correct conceptual decisions quickly.

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## Gs: Letter-Pattern Matching [WJ IV COG]



- Measures an aspect of cognitive efficiency -the speed at which an individual can make visual symbol discriminations and identify common orthographic (spelling patterns).
- The examinee is asked to locate and circle the two identical letter patterns in a row of six patterns in the Response Booklet. The letter patterns that match are always a possible English spelling pattern (e.g., *ao* or *sh*).

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## Gs: Letter-Pattern Matching [WJ IV COG]



- Measure of *Gs* (perceptual speed) and orthographic processing.
- This speeded test (all WJ IV speeded tests) is based on a new rate-based method of scaling the scores that eliminates the need for bonus points.
- Within *Gs*, it matches Number Pattern Matching in *g*, *Gs* factor loading, and prediction of achievement. Is more cognitively complex than Number Pattern Matching.

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### Gs: Pair Cancellation [WJ IV COG]



- Provides information about executive processing, attention/concentration, and processing speed abilities.
  - Executive processing - interference control
  - Attention/concentration - sustained attention
  - Processing speed - performance under time constraints.
- The task requires the child to find and mark a repeated pattern of objects throughout a page of objects within a time frame.

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### Gs: Number-Pattern Matching [WJ IV COG]



- Formerly called Visual Matching?
- A test of processing speed, and more specifically, perceptual speed.
- Measures an aspect of cognitive efficiency - the speed at which an individual can make visual symbol discriminations.
- Example: Circle the two numbers in this row that are the same:

24 48 76 24 87

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## CHC Factors on the WJ IV



### Auditory Processing (Ga)

- **WJ IV Cognitive Battery:**
  - Phonological Processing (Phonetic Coding - PC; *Glr* Listening Ability - LA) **NEW!**
  - Nonword Repetition (Phonetic Coding - PC/ Memory for Sound Patterns - UM; Auditory Memory Span - MS) **NEW!**
- **WJ IV Oral Language Battery:**
  - Segmentation (Phonetic Coding - PC) **NEW!**
  - Sound Blending (Phonetic Coding - PC)
  - Sound Awareness (Phonetic Coding - PC)

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## Ga: Auditory Processing



- **Measures** the ability to analyze, synthesize, and discriminate auditory stimuli, including the ability to process and discriminate speech sounds that may be presented under distorted conditions.
- **Deficits include:** speech discrimination problems; poor phonological knowledge; failure to recognize sounds; inability to distinguish speech sounds amid other noises; increased likelihood of misunderstanding complex verbal instructions.

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### *Ga*: Phonological Processing **NEW!** [WJ IV COG]



- *Ga* (PC) / *Glr* (LA/FW)
- 3 subtests (Word Access; Word Fluency; Substitution).
- Word Access requires the examinee to provide a word that has a specific phonemic element in a specific location (apple for the "a" sound).
- Word Fluency requires the examinee to name as many words as possible that begin with a specified sound in 1 minute.
- Substitution requires the examinee to substitute part of a word to create a new word: "cake" replace "cuh" sound with "buh" sound, becomes "bake".

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### *Ga*: Phonological Processing **NEW!** [WJ IV COG]



- Measures **three** aspects of speech sound processing that requires the efficiency of **construction of sound-based lexical representations**.
- High in **cognitive complexity** and ***g***. Best single ***Ga* test predictor of achievement**. High loading on ***Ga*** and secondary low loading on ***Gc* (accessing the lexicon)**. Also loaded on **narrow LA factor** in broad+**narrow** bottom-up CFA models.

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**Ga: Nonword Repetition NEW!**  
**[WJ IV COG]**



- Examinee listens to a nonsense word and then must repeat the word exactly.
- Requires **temporary storage of phonological segments in immediate awareness**.
- Significant body of research has found such tasks to be significantly related to (and be possible "markers" of) **reading disabilities, dyslexia and SLI** (specific language impairment)

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**Ga: Segmentation NEW!**  
**[Oral Language Battery]**



- **Ga** (PC)
- Examinee listens to words and identifies word parts.
- In Oral Language Phonetic Coding (PC) cluster.
- Highest loading test on **Ga** factor across all ages
- A **moderate** measure of **g** and **predictor of ach.** across all ages; much more so (and more cognitively complex) than Sound Blending.
- Such tasks have been reported to be strong predictors of early reading (Bouwmeester et al, 2011; Geuden & Sandra, 2003).

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**Ga: Sound Blending**  
**[Oral Language Battery]**



- Measures skills in synthesizing language sounds.
- The child listens to a series of syllables or phonemes and then is asked to blend the sounds into a word.
- The items become more difficult as the words become more complex and more fragmented.

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**Ga: Sound Awareness**  
**[Oral Language Battery]**



- Requires manipulating phonemes to produce oral responses.
- 2 subtests: Rhyming, & Deletion
- Measures the analysis and synthesis processes involved in decoding and spelling.

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## CHC Factors on the WJ IV



### Visual Processing (Gv)

- **WJ IV Cognitive Battery:**
  - Visualization (Visualization - VZ) **NEW!**
  - Picture Recognition (Visual Memory - MV)

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## Gv: Visual-Spatial Thinking



- **Measures** the ability to perceive, analyze, synthesize, and think with visual patterns, including the ability to store and recall visual representations.
- **Deficits in:** poor spatial orientation; misperception of object-space relationships; problems remembering visually presented material; tendency to miss subtle visual social and interpersonal cues.

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### Gv: Visualization NEW! [WJ IV COG]



- Measure of *Gv*-Visualization (*Vz*).
- Visualization consists of **two subtests** (**Block Rotation** from the WJ III DS and **Spatial Relations** from the WJ III COG) that each measure *Gv*-*Vz* (visualization) via tasks that vary on **task complexity** and **degree of "minds eye"** (mental rotation) manipulations.
- Within *Gv*, highest on **cognitive complexity**, ***g***, ***Gv*** factor, and **prediction of achievement**.

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### Gv: Picture Recognition [WJ IV COG]



- Measures visual immediate or short-term memory of objects or pictures, and aspect of visual-spatial thinking.
- The child's task is to recognize a subset of previously presented pictures within a field of distracting pictures.
- To eliminate verbal mediation as a rehearsal strategy, varieties of the same type of object are used as stimuli and distracters for each item.
- The difficulty of the items increases as the number of pictures in the stimulus set increase.

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## CHC Factors on the WJ IV



### Comprehension-Knowledge (Gc)

- **WJ IV Cognitive Battery:**
  - Oral Vocabulary (Lexical Knowledge - VL)
  - General Information (General Verbal Information - KO)
- **WJ IV Oral Language Battery:**
  - Picture Vocabulary (Lexical Knowledge - VL/Language Development - LD)
  - Oral Comprehension (Listening Skills - LS)

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## Gc: Comprehension-Knowledge



- **Measures** the breadth and depth of a person's acquired knowledge, the ability to communicate one's knowledge (especially verbal), and the ability to reason using previously learned experiences or procedures.
- **Deficits in:** lack of information or language skills; or inability to communicate one's knowledge.

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### Gc: Oral Vocabulary [WJ IV COG]



- Includes two parts:
  - Synonyms - measures an aspect of vocabulary knowledge. The task requires hearing a word and providing a synonym.
  - Antonyms - measures an aspect of vocabulary knowledge. The task requires hearing a word and providing an antonym.

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### Gc: General Information [WJ IV COG]



- Measures the depth of one's general verbal knowledge.
- Two subtests (What and Where):
  - The child is asked "Where would you find [an object]?"
  - The child is asked "What would you do with [an object]?"
  - The initial items in each subtest draw from everyday objects, and the items become increasingly difficult as the objects become more obscure.

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### Gc: Picture Vocabulary [Oral Language Battery]



- Requires naming pictures (familiar to less familiar).
- Measures vocabulary, verbal ability, and knowledge of culture.
- Low performance may result from limited vocabulary, limited exposure to the prevalent culture, or word retrieval problems.

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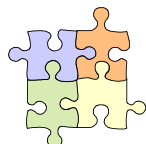
### Gc: Oral Comprehension [Oral Language Battery]



- Requires listening to a short passage and providing the missing final word.
- Measures listening ability and language development.
- Low performance may result from limited semantic or syntactic knowledge or poor attention.

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## CHC Factors on the WJ IV



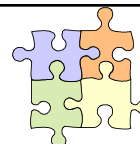
### Fluid Reasoning (Gf)

- **WJ IV Cognitive Battery:**

- Number Series (Quantitative Reasoning - RQ)
- Concept Formation (Induction - I)
- Analysis-Synthesis (General Sequential Reasoning - RG)

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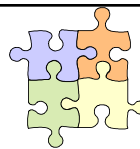
## Gf: Fluid Reasoning



- **Measures** the broad ability to reason, form concepts, and solve problems using unfamiliar or novel procedures.
- **Deficits in:** grasping abstract concepts; generalizing rules, and seeing implications; may have difficulty changing strategies if first approach does not work.

66

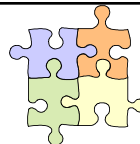
### *Gf*: Number Series [WJ IV COG]



- Originally on the WJ III Diagnostic Supplement.
- Measures quantitative reasoning, a narrow ability of *Gf*.
- The task presents a series of numbers with a number missing. The student must determine the numerical pattern and provide the missing number in the series.
- Example: 2 - 4 - 6 \_\_\_\_ - 10 - 12

67

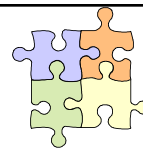
### *Gf*: Concept Formation [WJ IV COG]



- Woodcock's answer to the Category Test.
- Involves categorical reasoning based on principles of *inductive logic*.
- Also measures an aspect of executive processing - flexibility in thinking when required to shift one's mental set frequently.
- This test does not include a memory component. Requires the child to examine a stimulus set then formulate a rule that applies to that item.

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### **Gf: Analysis-Synthesis [WJ IV COG]**



- A measure of fluid reasoning that measures sequential (**deductive**) reasoning.
- A controlled-learning task and is designed to measure the ability to reason and draw conclusions from given conditions.
- The child is given instructions on how to perform an increasingly complex procedure that requires him or her to examine and solve a series of puzzles.

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## **WJ IV TESTS OF ACHIEVEMENT**

70

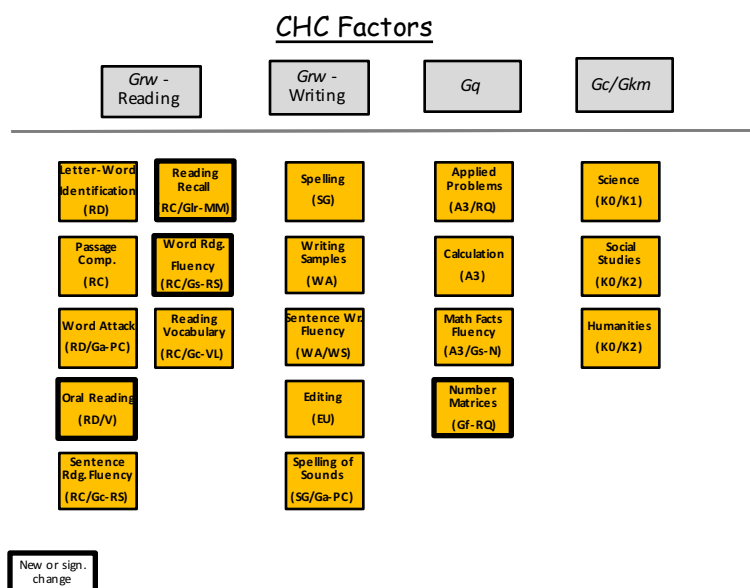


## Achievement: What's New?

- Co-normed with WJ IV Tests of Cognitive Abilities *and* WJ IV Tests of Oral Language
- **Qualitative Observation Checklists** for Tests 1-11
  - Located in Test Record
  - Helps document important information about how examinee performed on the task
  - Includes **data on percentage of age mates** at each rating




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## WJ IV ACH Tests by CHC factor domains




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Predictor	Clusters from WJ IV ACH	WJ IV OL Oral Language/ Ach. Comparison Procedure available in English and Spanish
<b>Broad Oral Language</b> <i>Test 1: Picture Vocabulary</i> <i>Test 2: Oral Comprehension</i> <i>Test 6: Understanding Directions</i> OR <b>Amplio lenguaje oral</b> <i>Test 10: Vocabulario sobre dibujos</i> <i>Test 11: Comprensión oral</i> <i>Test 12: Comprensión de indicaciones</i>	Broad Basic Skills Reading Comprehension Comprehension- Extended Reading Fluency Reading Rate Mathematics Broad Mathematics Math Calculation Skills Math Problem Solving Written Language Broad Written Language Basic Writing Skills Written Expression Academic Skills Academic Fluency Academic Applications Phoneme-Grapheme Knowledge Academic Knowledge	  

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WJ IV Tests of Achievement Selective Testing Table																					
Table x-x. WJ IV ACH Selective Testing Table																					
 <b>TESTS OF ACHIEVEMENT</b>		Reading					Math				Writing			Cross-Domain Clusters							
		Reading	Broad Reading	Basic Reading Skills	Reading Comprehension	Reading Fluency	Reading Rate	Mathematics	Broad Mathematics	Math Calculation Skills	Math Problem Solving	Written Language	Broad Written Language	Basic Writing Skills	Written Expression	Academic Skills	Academic Fluency	Academic Applications	Academic Knowledge	Phoneme-Grapheme Knowledge	Brief (or Broad) Achievement
Standard Easel	ACH-01 Letter-Word Identification	■	■	■				■	■		■					■					■
	ACH-02 Applied Problems							■	■		■						■				■
	ACH-03 Spelling											■	■	■		■					■
	ACH-04 Passage Comprehension	■	■		■													■			■
	ACH-05 Calculation							■	■	■						■					■
	ACH-06 Writing Samples											■	■		■			■			■
	ACH-07 Word Attack			■																■	
	ACH-08 Oral Reading					■															■
	ACH-09 Sentence Reading Fluency		■			■	■										■				■
	ACH-10 Math Facts Fluency							■	■								■				■
	ACH-11 Sentence Writing Fluency											■		■			■				■
Extended Easel	ACH-12 Reading Recall				■																
	ACH-13 Number Matrices									■											
	ACH-14 Editing												■								
	ACH-15 Word Reading Fluency						■														
	ACH-16 Spelling of Sounds																			■	
	ACH-17 Reading Vocabulary				□																
	ACH-18 Science																		■		
	ACH-19 Social Studies																		■		
	ACH-20 Humanities																		■		

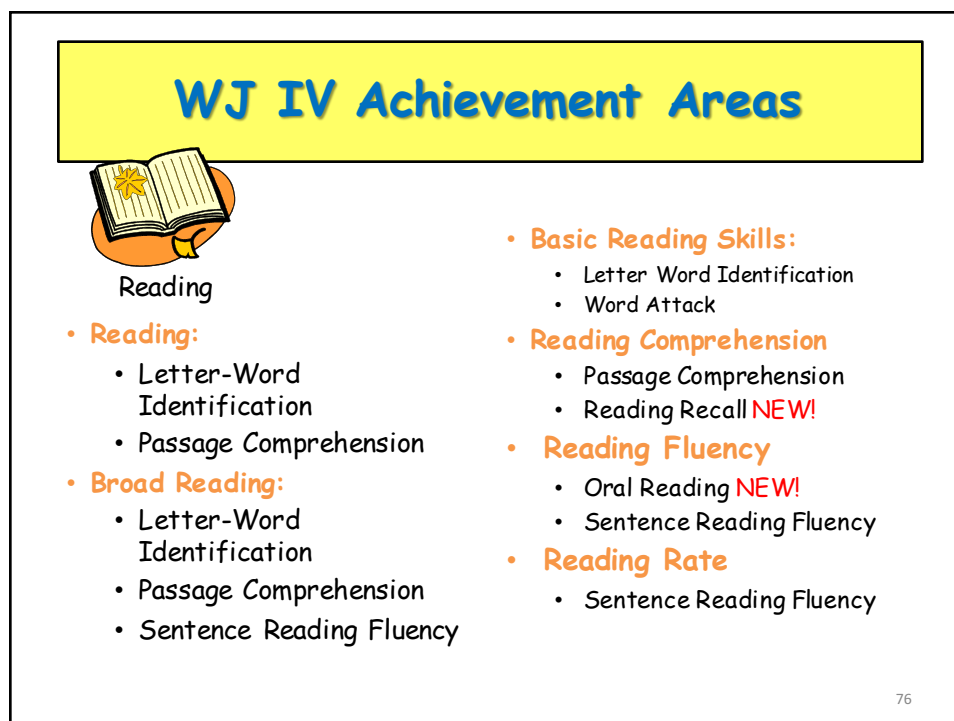
■ Tests required to create the cluster listed.

□ Additional test required to create an extended version of the cluster listed.

● Additional tests required to create Broad Achievement.

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## Reading: Letter-Word Identification



- Requires the child to read isolated letters and words orally.
- A measure of reading decoding (sight recognition), including reading readiness skills.
- The items are presented in a list rather than in context. It is not necessary to know the meaning of the words.
- Individuals with inefficient or nonexistent strategies for word identification typically have poor performance on this test.

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## Reading: Letter-Word Identification



- Compare results from the Reading Vocabulary test to develop insights into the child's acquisition of reading skills with and without context of meaning.
- Compare LWI with Word Attack to determine differences between word identification and phonic skills.

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## Reading: Word Attack



- Requires the child to read phonically regular and nonsense words orally.
- Measures aspects of orthographic and phonological coding.
- Knowledge of phoneme/grapheme relationships is necessary to perform well on this test.
- Low performance may result from poor decoding skills and strategies, lack of fluency, poor auditory processing, or limited phoneme/grapheme knowledge.
- Impaired decoding is thought to be one cause of reading problems.

79

## Reading: Passage Comprehension



- Requires the child to read a passage silently, comprehend the information, and provide a missing word.
- It is a measure of reading comprehension and lexical knowledge .
- The modified cloze task requires the ability to use syntactic and semantic clues in comprehending contextual information.

80

## Reading: Sentence Reading Fluency



- Requires reading and comprehending simple sentences rapidly.
- Measures reading speed, automaticity, and rate of test taking.
- Low performance may be a result of limited basic reading skills, slow perceptual speed, comprehension difficulties, or an inability to sustain concentration.

81

## Reading: Reading Recall **NEW!**



- A measure of reading comprehension (a reading-writing *Grw* ability) and meaningful memory (*Gl/r*) ability.
- The individual reads a short story silently and then retells as much of the story as he/she can recall.

82

## Reading: Oral Reading **NEW!**



- A measure of story reading accuracy and prosody, a reading-writing ability (*Grw*).
- The individual reads aloud sentences that gradually increase in difficulty.
- Performance is scored for both accuracy and fluency of expression.

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## WJ IV Achievement Areas



### Mathematics

- Mathematics:
  - Applied Problems
  - Calculation
- Broad Mathematics:
  - Applied Problems
  - Calculation
  - Math Facts Fluency
- Math Calculation Skills
  - Calculation
  - Math Facts Fluency
- Math Problem Solving
  - Applied Problems
  - Number Matrices

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## Mathematics: Calculation



- Requires the child to perform a variety of calculations ranging from simple addition to complex calculus.
- Measures the ability to perform mathematical computations that are fundamental to more complex math reasoning and problem solving.
- Fluency with calculation is more fundamental to more complex math.

85

## Mathematics: Applied Problems



- Requires a child to analyze and solve practical math problems.
- Measures quantitative reasoning, math achievement, and math knowledge.
- Because no reading is required, low performance will likely be related to limits in mathematical knowledge.
- Low performance may be due to:
  - Poor fluid reasoning skills, limited math skills, or comprehension difficulties.

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## Mathematics: Math Facts Fluency



- Requires rapid calculation of single-digit addition, subtraction, and multiplication facts.
- Low performance may result from:
  - Limited basic math skills
  - Lack of automaticity
  - Limited attention
  - Slow processing speed (Gs)

87

## Mathematics: Number Matrices



- Measures quantitative reasoning.
- Ability to analyze the relationship among numbers and identify the missing number.

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## WJ IV Achievement Areas



### Written Language

- Written Language
  - Spelling
  - Writing Samples
- Broad Written Language
  - Spelling
  - Writing Samples
  - Sentence Writing Fluency
- Basic Writing Skills
  - Spelling
  - Editing
- Written Expression
  - Writing Samples
  - Sentence Writing Fluency

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## Written Language: Spelling



- Requires the child to produce, in writing, single letters or words in response to oral prompts.
- Several factors that may influence performance include:
  - Handwriting
  - Fine-motor skill
  - Phonological coding
  - Orthographic coding

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## Written Language: Writing Samples



- Requires the child to produce meaningful written sentences in response to a variety of tasks.
- Low performance may result from:
  - Limits in oral language
  - Limits in vocabulary
  - Limits in organizational ability
  - Limits in word knowledge
  - Limits in spelling
  - Poor Motivation

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## Written Language: Sentence Writing Fluency



- Requires the child to produce, in writing, legible, simple sentences with acceptable English syntax.
- Low performance may result from:
  - Limited concentration
  - Poor motor control
  - Limited spelling or reading skills
  - Limited processing speed.

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### Written Language: Editing



- Requires the ability to identify and correct errors in punctuation, capitalization, spelling, and word usage in short written passages.
- Low performance may result from limited instruction, lack of knowledge, failure to self-monitor, or self-correct errors, or poor reading.

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### Written Language: Spelling of Sounds (Supplemental)



- Requires child to spell nonsense words that conform to conventional phonics and spelling rules.
- Both phonological coding and orthographic coding are measured by this test.
- Low performance may be due to lack of attention, poor phonological processing, poor orthographic awareness, or poor phoneme/grapheme knowledge.

94

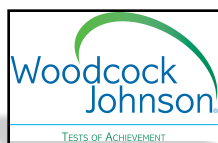
## WJIII Achievement Areas



Academic Knowledge

- Academic Knowledge Cluster:
  - Science
  - Social Studies
  - Humanities

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## Academic Knowledge

- Includes **3 tests** measuring various aspects of academic knowledge (comprehension-knowledge [Gc])
  - **Test 18: Science**
  - **Test 19: Social Studies**
  - **Test 20: Humanities**
- Provides 1 cluster: **Academic Knowledge**
  - Serves as the ability score in an ability/achievement comparison procedure

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## Supplemental Achievement Cluster Scores

97

## Cross-Domain Achievement Clusters

- Academic Skills
  - Letter-Word Identification
  - Spelling
  - Calculation
- Academic Fluency
  - Sentence Reading Fluency
  - Math Facts Fluency
  - Sentence Writing Fluency
- Academic Applications
  - Applied Problems
  - Passage Comprehension
  - Writing Samples
- Academic Knowledge
  - Science
  - Social Studies
  - Humanities
- Phoneme-Grapheme Knowledge
  - Word Attack
  - Spelling of Sounds

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## Brief and Broad Achievement Clusters

### Brief Achievement Cluster:

- Letter-Word Identification
- Applied Problems
- Spelling

### Broad Achievement Cluster:

- Letter-Word Identification
- Applied Problems
- Spelling
- Passage Comprehension
- Calculation
- Writing Samples
- Sentence Reading Fluency
- Math Facts Fluency
- Sentence Writing Fluency

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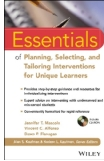
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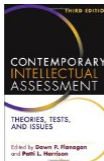
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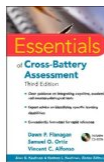
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