Use of the WISC-V in Diagnosis of Specific Learning Disability

Dawn P. Flanagan, Ph.D.

St. John's University, New York

Yale Child Study Center, School of Medicine

Differentially diagnosing SLD from other conditions that also result in low achievement

- Intellectual Disability (ID)
- General Learning Difficulty (Slow Learner)
  - *Also referred to as, Low General Ability or Borderline Intellectual Functioning (BIF)*

Purpose of Cognitive and Neuropsychological Assessment

General

- To inform diagnosis (e.g., using data in a PSW Analysis)
- To inform intervention

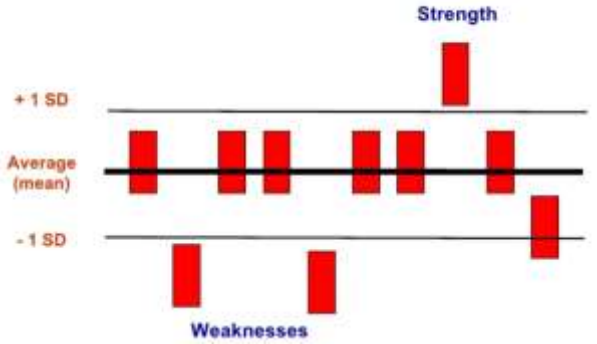
Specific

- To understand specific cognitive strengths and weaknesses and how they interact with the child's educational environment and impact the child's ability to access the curriculum

Analysis of Data from A Comprehensive Evaluation of a Student Who Does Not Respond as Expected to Instruction and Intervention May Reveal a Pattern of Strengths and Weaknesses that is Consistent with SLD

The PSW Method

Interpretation of PSW



- Requires an understanding of contemporary theory
- Requires an understanding of the theoretical constructs that are measured by cognitive batteries
- Requires understanding of cognitive processes and abilities related to achievement
- May require cross-battery assessment to assess all the abilities and processes considered important based on referral and to follow up on aberrant test performances
- Requires understanding of the SLD construct

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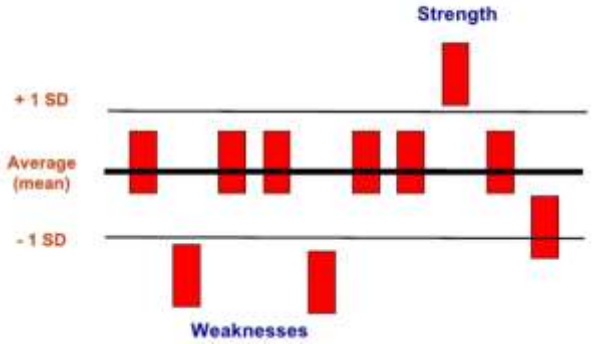

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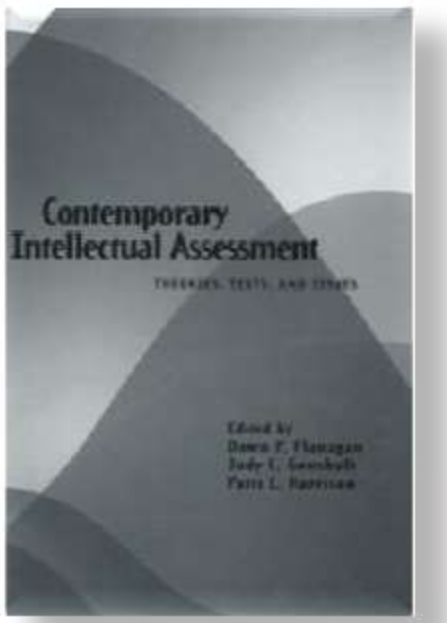
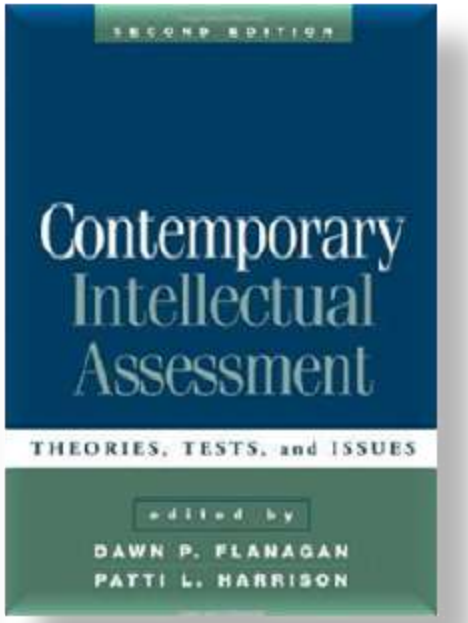
Over Two Decades of Revisions and Refinements to Gf-Gc/CHC Theory



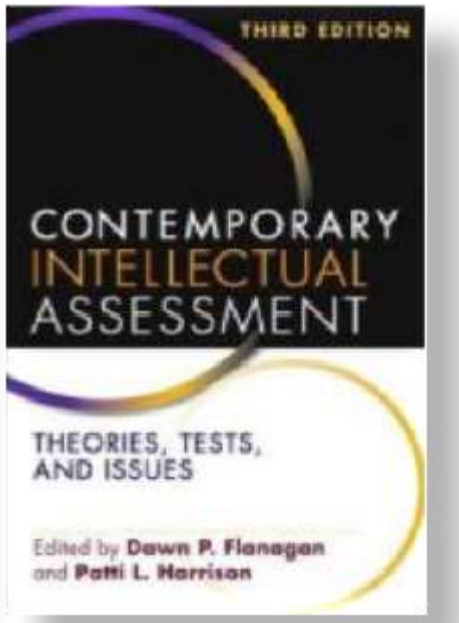
1997

Chapter by **McGrew**: First attempt at Integrating Cattell-Horn Gf-Gc Theory and John Carroll's Three-Stratum Theory



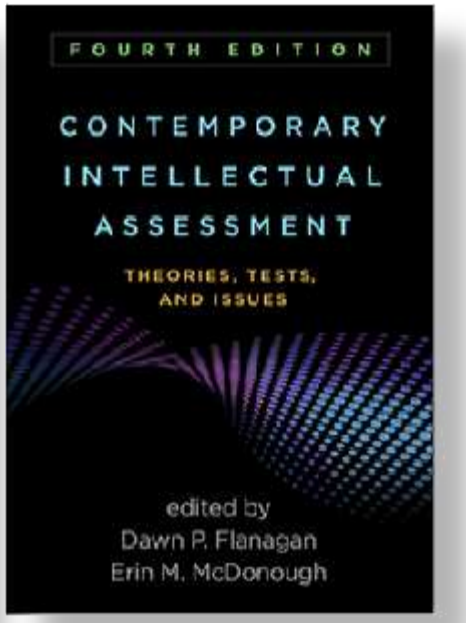
2005

Chapter by **McGrew**: Documentation of how the integrated model presented in 1997 and again in 2000 became known as CHC theory



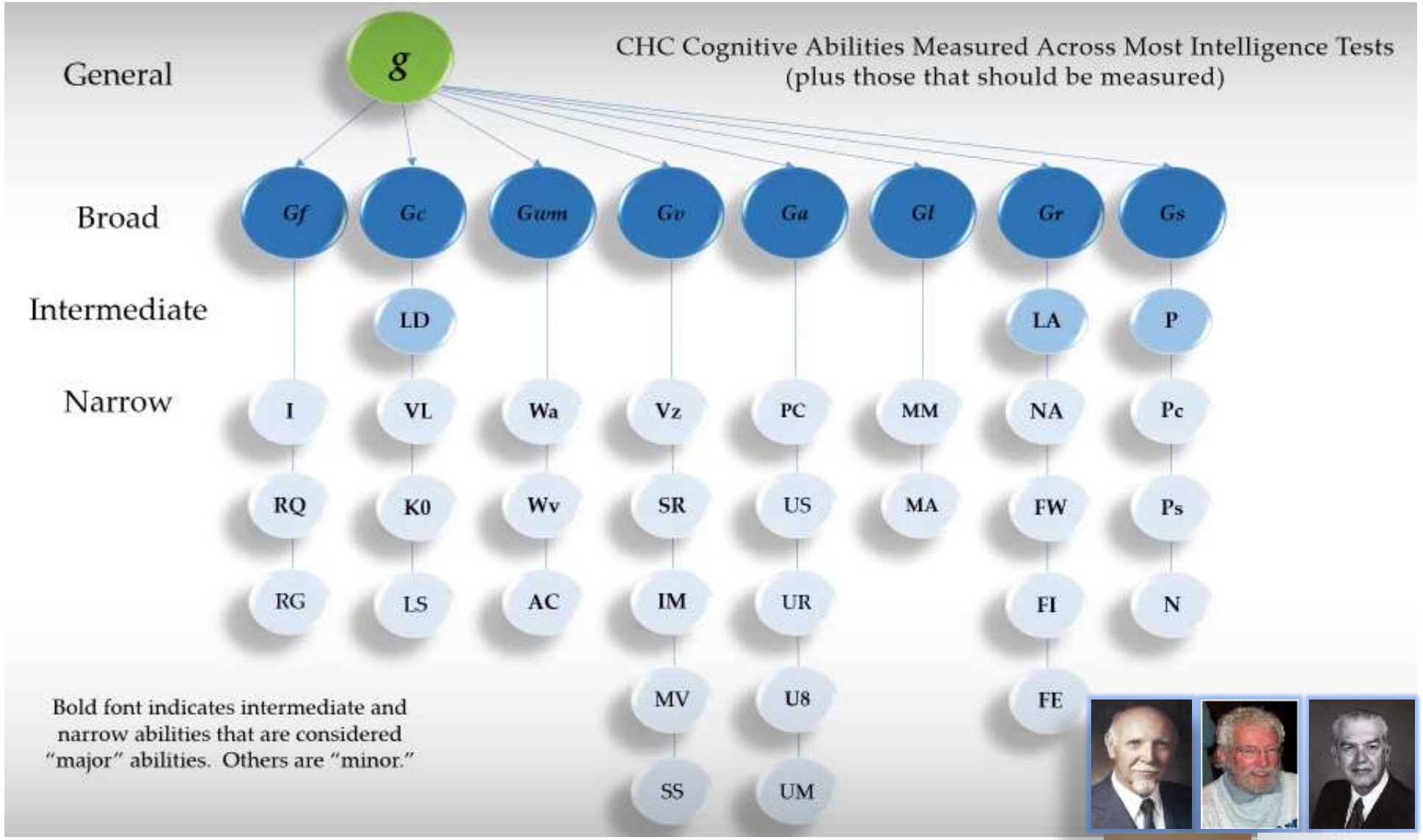
2012

Chapter by **Schneider and McGrew**: Careful review of the literature led to some substantial modifications



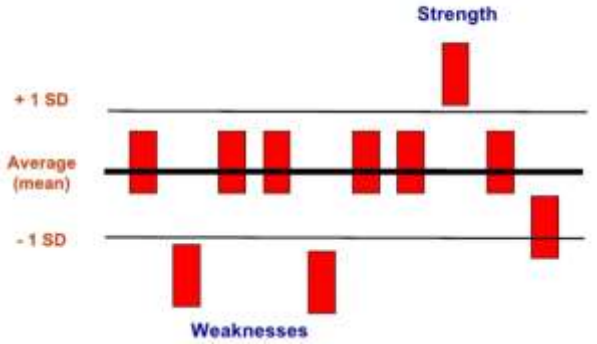
2018

Chapter by **Schneider and McGrew**: Most significant revisions to CHC theory to date and criteria for revisions to the CHC taxonomy



CHC Theory Revised: A Visual Graphic Summary of **Schneider and McGrew's** 2018 Chapter in Flanagan & McDonough's (Eds.) *Contemporary Intellectual Assessment*, fourth edition. NY: Guilford. Posted on McGrew's MindHub May 11, 2018

Interpretation of PSW



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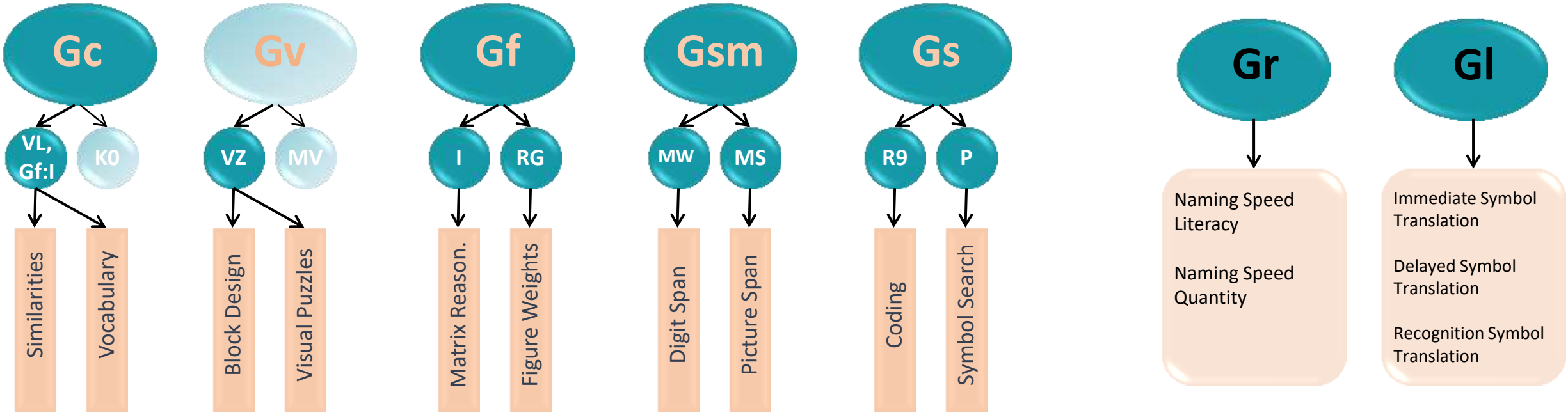
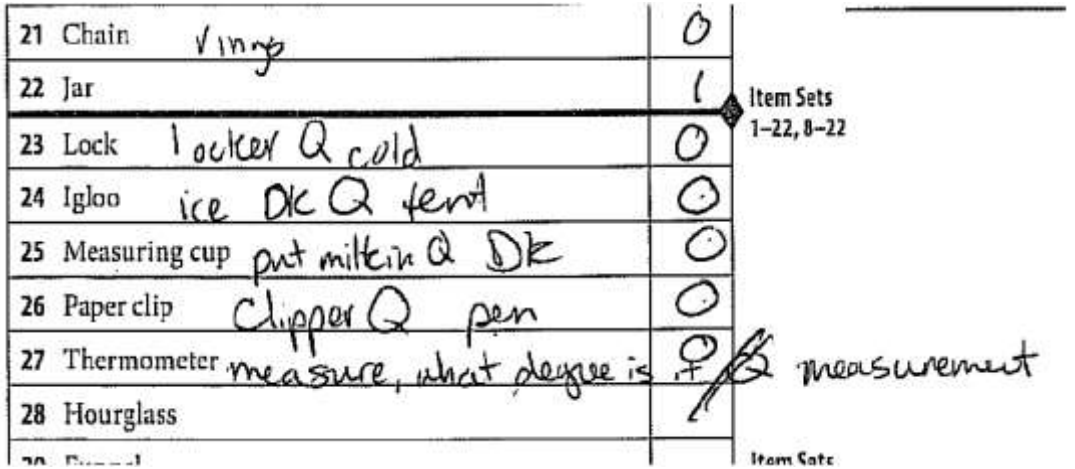
WISC-V Primary Index Scales



Evaluation of *Vocabulary Knowledge* - *Gc* (Looking for an Exact Word)

- DAS-II Naming Vocabulary = **79**
- CELF-4 Expressive Vocabulary = **75**



21 Chain	Rings	0
22 Jar		1
23 Lock	locker Q cold	0
24 Igloo	ice DK Q tent	0
25 Measuring cup	put milk in Q DK	0
26 Paper clip	clipper Q pen	0
27 Thermometer	measure, what degree is it Q measurement	0
28 Hourglass		

Item Sets 1–22, 8–22

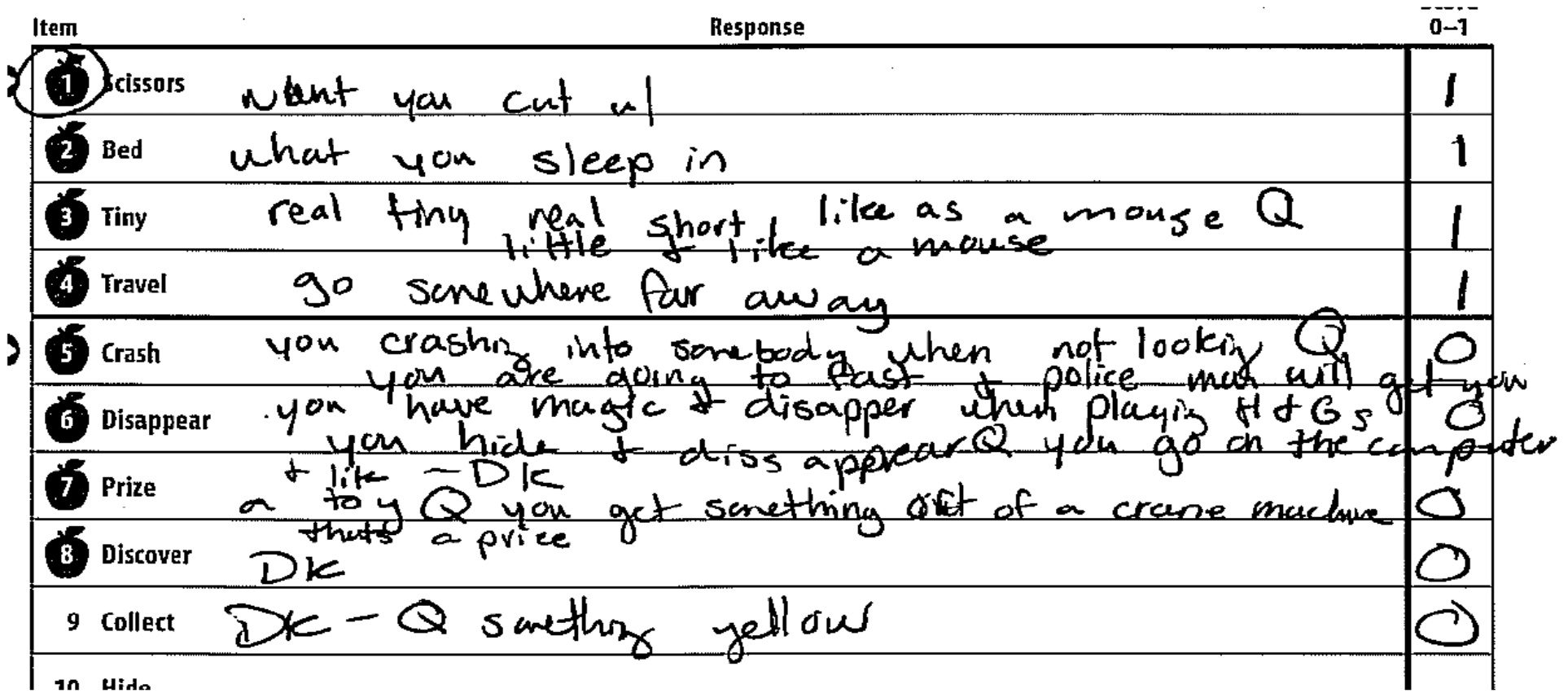
Item Sets

16. bowling pin	bowling ball	2 1 0
19. thermometer, termometer, 'mometer	measuring like ... IDK	2 1 0
20. scale, weighing scale, weight scale	foot step where you see how much pounds you weigh	2 1 0

Retrieval Difficulties? - Glr

Evaluation of *Vocabulary Knowledge - Gc* (Looking for an Exact Word)

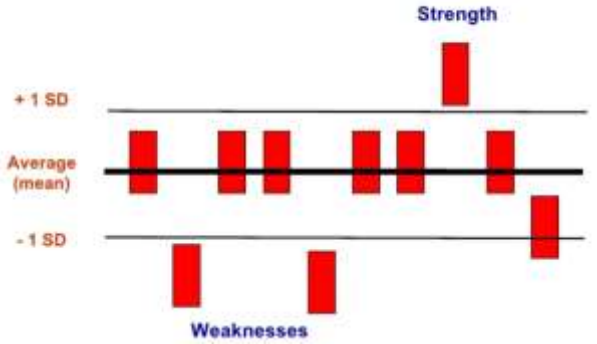
- DAS-II Word Definitions = **90**



Item		Response	0–1
1	Scissors	what you cut w/	1
2	Bed	what you sleep in	1
3	Tiny	real tiny real short like as a mouse Q little & like a mouse	1
4	Travel	go somewhere far away	1
5	Crash	you crashin into somebody when not lookin Q you are going to fast & police man will get you	0
6	Disappear	you have magic & disapper when playin H & Gs Q you hide & diss appear Q you go on the computer	0
7	Prize	& like – DK a toy Q you get something off of a crane machine thats a price	0
8	Discover	DK	0
9	Collect	DK – Q something yellow	0
10	Hide		

Broader parameters; Can give enough information to show understanding

Interpretation of PSW



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Summary of Relations between CHC Abilities and Neuropsychological Processes and Reading Achievement and the Etiology of Reading Functions

CHC Broad Ability	Reading Achievement	Etiology of Reading Functions
Gf	**Inductive (I)** and **general sequential reasoning (RG)** abilities play a moderate role in **reading comprehension**. Executive functions such as planning, organization, and self-monitoring are also important.	Several cortical and subcortical structures are frequently implicated in **basic reading skills** and **word reading accuracy.** Recent work appears to identify dysfunction in a left hemispheric network that includes the occipitotemporal region, inferior frontal gyrus, and inferior parietal region of the brain (Silani et al., 2005; Shaywitz et al., 2000; Fletcher, Simos, Papanicolaou, & Denton, 2004; Richlan et al., 2009; Richlan, 2012). Numerous imaging studies have also found that dysfunctional responses in the left inferior frontal and temporo-parietal cortices play a significant role with regard to phonological deficits (Skeide et al., 2015). Similar brain regions are activated on tasks involving **reading fluency**, but additional activation is observed in areas involved in eye movement and attention (Jones, Ashby, & Branigan, 2013). Further, there is also evidence for increased activation in the left occipitotemporal region, in particular the occipitotemporal sulcus, which is important for rapid processing of letter patterns (Shaywitz et al., 2004; Dehaene & Cohen, 2011). Brain regions often associated with **reading comprehension** include the anterior temporal lobe, inferior temporal gyrus, inferior frontal gyrus, inferior frontal sulcus, and middle and superior frontal and temporal regions (Ferstl et al., 2008; Gernsbacher & Kaschak, 2003). More recent research has revealed a relationship between listening and reading comprehension and activation along the left superior temporal sulcus, which has referred to by some as the "comprehension cortex" (Berl et al., 2010). However, broader pathways are also activated in reading
Gc	**Language development (LD), lexical knowledge (VL)**, and **listening ability (LS)** are important at all ages for **reading acquisition and development**. These abilities become increasingly important with age. Oral Language, Listening Comprehension, and EF (planning, organization, self-monitoring) also important for **reading comprehension**.	
Gwm	**Memory span (MS)** and **working memory capacity (WM)** or attentional control are important for **overall reading** success. Phonological memory or WM for verbal and sound-based information may also be important. WM is important for **reading comprehension**, which involves holding words and sentences in awareness, while integrating prior knowledge with incoming information.	
Gv	Orthographic processing (often measured by tests of perceptual speed that use orthographic units as stimuli) is related to **reading rate and fluency.** Orthographic processing involves the ability to process units of words based on visual long-term memory representations, which is critical for automatic word recognition.	
Ga	**Phonetic coding (PC)** or phonological awareness / processing is very important during the elementary school years for the development of **basic reading skills and word reading accuracy**. Phonological memory or WM for verbal and sound-based information may also be important.	

Summary of Relations between CHC Abilities and Neuropsychological Processes and Reading Achievement and the Etiology of Reading Functions (Cont'd)

Glr	**Naming facility (NA)** or **rapid automatic naming** (RAN; also called speed of lexical access) is very important during the elementary school years for **reading rate and fluency or word recognition skills.** **Associative memory (MA)** is also important.	comprehension, reflecting increased cognitive demand compared to listening. Family and genetic factors have long been identified as crucial in reading achievement, with some researchers suggesting that a child with a parent with a reading disability is eight times more likely to be dyslexic compared to the general population (Pennington & Olson, 2005). Shared environmental factors include: language and literacy environment during childhood (Wadsworth et al., 2000), and quality of reading instruction.
Gs	**Perceptual speed (P)** abilities are important throughout school, but particularly during the elementary school years.	

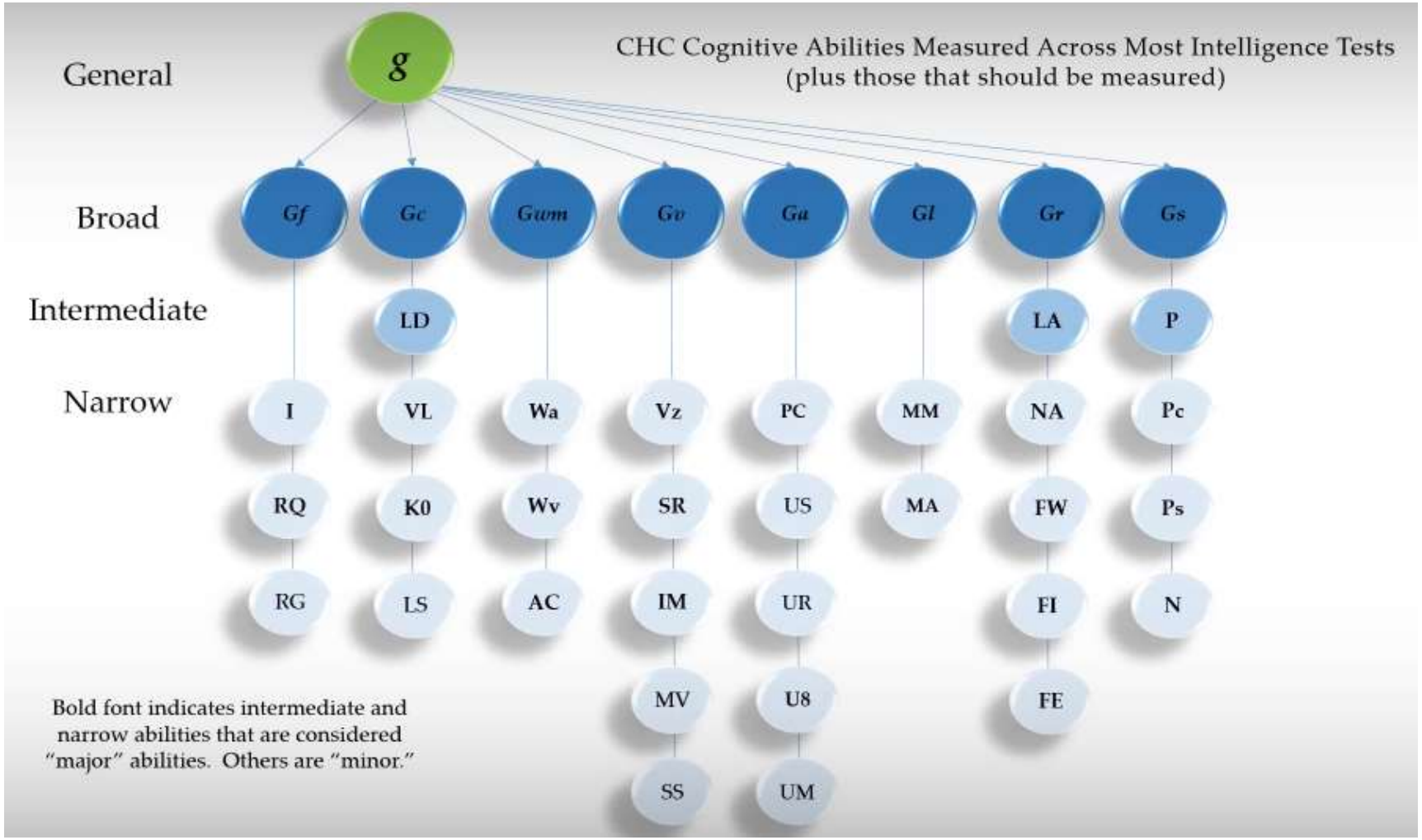
Note: Information in this table was culled from the following sources: Flanagan, Ortiz, Alfonso, & Mascolo, 2006; Flanagan, Ortiz, & Alfonso, 2013; McDonough, Flanagan, Sy, & Alfonso, 2017; McGrew & Wendling, 2010; McGrew et al., 2014)

Summary of Relations between CHC Abilities and Neuropsychological Processes and Math Achievement and the Etiology of Math Functions

CHC Broad Ability	Math Achievement	Etiology of Math Functions
Gf	**Reasoning inductively (I)** and **deductively with numbers (RQ)** is very important for **math problem solving**. Executive functions such as set shifting and cognitive inhibition are also important.	The intraparietal sulcus in both hemispheres is widely viewed as crucial in processing and representing numerical quantity **(number sense)**, although there may be differences in activation as a function of age (Ansari & Dhital, 2006; Ansari, Garcia, Lucas, Hamon, & Dhital, 2005; Dehaene et al., 2004; Kaufmann et al., 2006; Kucian, von Aster, Loenneker, Dietrich, & Martin, 2008; Price & Ansari, 2013; Mussolin et al., 2010). Regions of the left fronto-parietal cortex, including the intraparietal sulcus, angular gyrus, and supramarginal gyrus have been consistently associated with **math calculation** (Ansari, 2008; De Smedt, Holloway, & Ansari, 2011; Dehaene, Molko, Cohen, & Wilson, 2004; Dehaene et al., 2004). The dorsolateral prefrontal cortex has also been found to show increased activation during calculation, implying that executive functioning and working memory may be playing a role in the process (Davis et al., 2009). A left hemisphere network that includes the precentral gryus, inferior parietal cortex, and intraparietal sulcus, is often implicated in **math fact retrieval** (Dehaene & Cohen, 1992; Dehaene & Cohen, 1997; Dehaene et al., 1999). Further, some researchers believe that rote math facts are retrieved from verbal memory, thereby requiring activation of the angular gyrus and other regions associated with linguistic processes (Dehaene, 1992; Dehaene & Cohen, 1995; Dehaene et al., 1999). Prevalence of math disabilities is about 10 times higher in those with family members who had math disabilities (Shalev et al., 2001). Environmental factors, including motivation, emotional functioning (e.g., math anxiety), and suboptimal or inadequate teaching may also contribute to math difficulties (Szucs & Goswami, 2013; Vukovic et al., 2013). Further, math achievement may be associated with cultural or gender-based attitudes that may be transmitted in the family environment (e.g., Chiu & Klassen, 2010; Gunderson et al., 2011).
Gc	**Language development (LD), lexical knowledge (VL)**, and **listening ability (LS)** are important at all ages for **math problem solving**. These abilities become increasingly important with age.	
Gwm	**Memory span (MS)** and **working memory capacity (WM)** or attentional control are important for **math problem solving** and overall success in math. (Including **math calculation**)	
Gv	**Visualization (VZ)**, including mental rotation, is important primarily for higher level math (e.g., geometry, calculus) and **math problem solving**.	
Ga		
Glr	**Naming facility (NA;** also called speed of lexical access) and **associative memory (MA)** are important for memorization and rapid retrieval of **basic math facts** and for accurate and fluent **calculation**.	
Gs	**Perceptual speed (P)** is important during all years, especially the elementary school years for **math calculation fluency**.	
Gr/Gs	Number representation (e.g., quantifying sets without counting, estimating relative magnitude of sets) and number comparisons are related to overall **number sense**.	

Summary of Relations between CHC Abilities and Neuropsychological Processes and Writing Achievement and the Etiology of Writing Functions

CHC Broad Ability	Writing Achievement	Etiology of Writing Functions
Gf	**Inductive (I)** and **general sequential reasoning (RG)** are consistently related to **written expression** at all ages. Executive functions such as attention, planning, and self-monitoring are also important.	Neural correlates of writing are less understood, but some studies have suggested that the cerebellum and parietal cortex, particularly the left superior parietal lobe, may be involved (Katanoda et al., 2001; Magrassi et al., 2010). In addition, the frontal lobes have also been implicated and are considered crucial in planning, brainstorming, organizing, and goal setting, which are important for **written expression** (Shah et al., 2013). Functional neuroimaging studies have provided substantial evidence for the role of the ventral-temporal inferior frontal gyrus and the posterior inferior frontal gyrus in **spelling** (Rapp et al., 2015; van Hoorn et al., 2013). Other areas that have been identified include the left ventral cortex, bilateral lingual gyrus, bilateral fusiform gyrus (Planton et al., 2013; Purcell et al., 2014; Richards et al., 2005; Richards et al., 2006). However, many of these regions have also been associated with reading and are not distinct to spelling / writing disorders. While there is a significant genetic component involved in the development of writing skills, this etiology is often shared with a broad variety of reading and language skills (Olson et al., 2013).
Gc	**Language development (LD), lexical knowledge (VL)**, and **general information (K0)** are important primarily after 2nd grade and become increasingly important with age. Level of knowledge of syntax, morphology, semantics, and VL has a significant impact on clarity of **written expression** and text generation ability.	
Gwm	**Memory span (MS)** is important to writing, especially **spelling** skills whereas **working memory (WM)** has shown relations with **advanced writing skills** (e.g., written expression; synthesizing multiple ideas, ongoing self-monitoring).	
Gv	Orthographic processing (often measured by tests of perceptual speed that use orthographic units as stimuli) is particularly important for **spelling**.	
Ga	**Phonetic coding (PC)** or phonological awareness / processing is very important during the elementary school years (primarily before 5th grade) for both **basic writing skills** and **written expression**.	
Glr	**Naming facility (NA;** also called speed of lexical access) has demonstrated relations with **writing fluency**. Storing and retrieving commonly occurring letter patterns in visual and motor memory are needed for **spelling**.	
Gs	**Perceptual speed (P)** is important during all school years for **basic writing skills** and is related to **written expression** at all ages.	



Brief definitions of commonly Measured Chc broad and narrow abilities

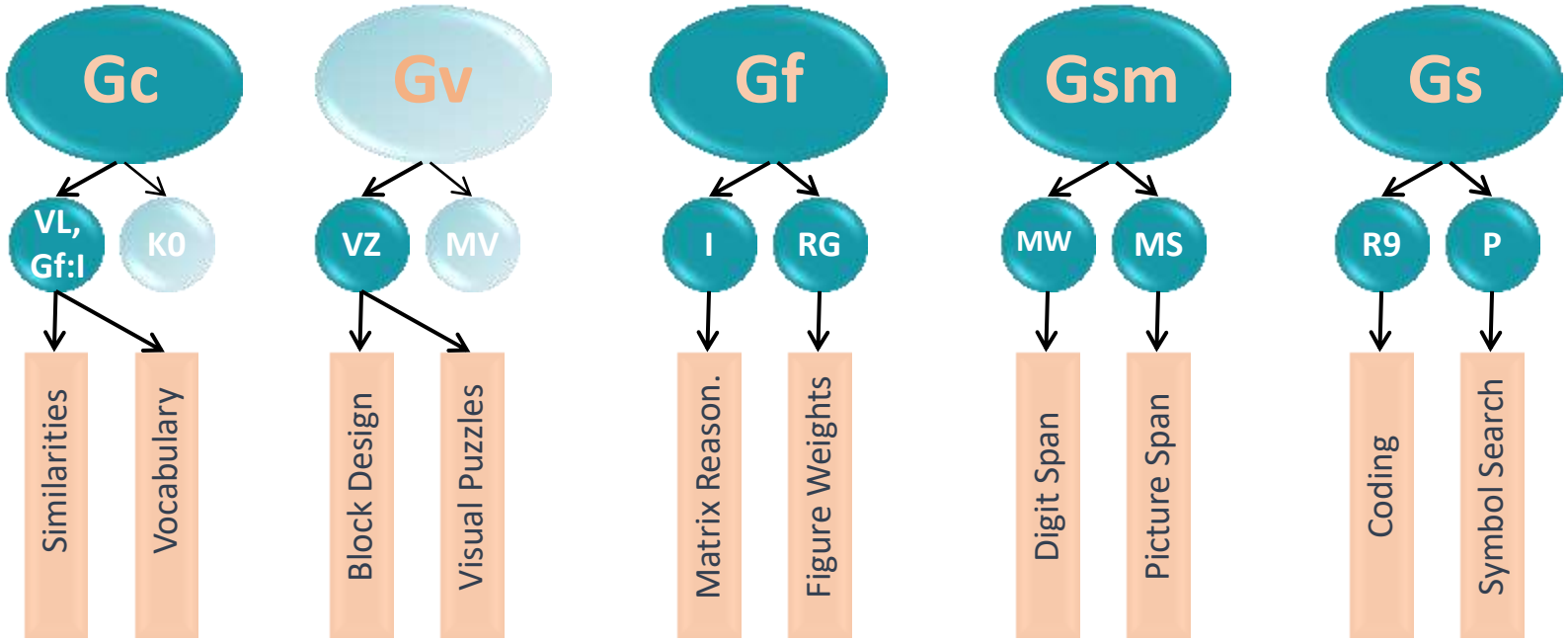
A Comprehensive Evaluation for Suspected SLD Ought to Include Measurement of Cognitive Abilities and Processes Within At Least Seven CHC Domains

Gf, Gc, Glr, Gsm, Gv, Ga, Gs

There is Evidence of Significant Positive Relationships Between Cognitive Abilities and Processes and Specific Academic Skills

Cognitive Processing Weaknesses Manifest in Real-World Performances (e.g., reading, math, writing achievement in the classroom)

WISC-V Primary Index Scales

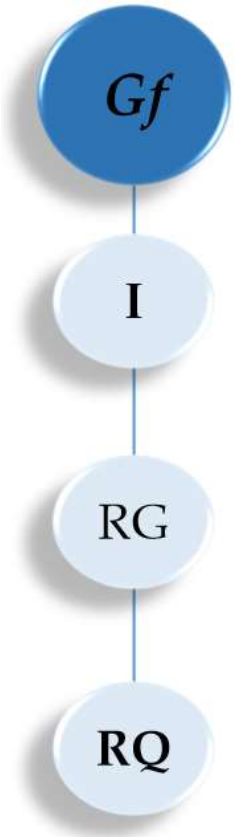


What is Fluid Reasoning (Gf)?

Fluid Reasoning (*Gf*) refers to a type of thinking that an individual may use when faced with a relatively new task that cannot be performed automatically.

- forming and recognizing concepts (e.g., how are a dog, cat, and cow alike?)
- identifying and perceiving relationships (e.g., sun is to morning as moon is to *night*)
- drawing inferences (e.g., after reading a story, answering the question, “What will John do next?”)
- reorganizing or transforming information (e.g., selecting one of several pictures to complete a puzzle).

A more formal definition: **Fluid Reasoning (Gf).** Gf refers to a type of thinking or reasoning that individuals use when faced with a relatively new or novel task that cannot be performed automatically. It requires the use of inductive, deductive, and quantitative reasoning when solving unfamiliar problems that are minimally dependent on prior knowledge.

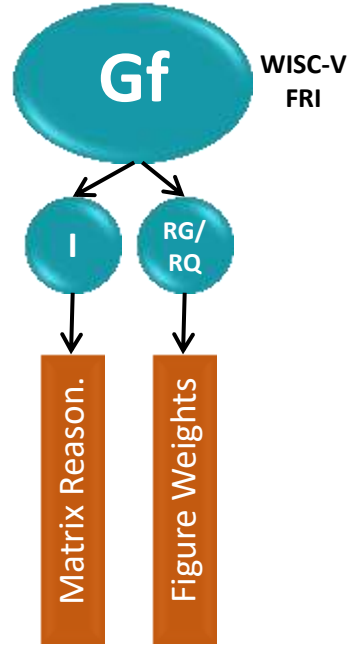


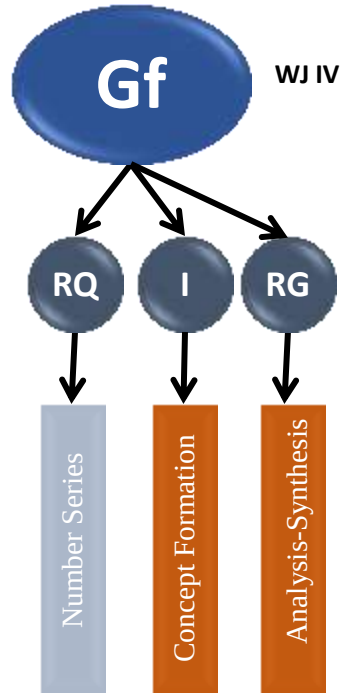
Fluid reasoning

Induction (I): The ability to observe a phenomenon and discover the underlying principles or rules that determine its behavior. This ability is also known as rule inference.

General Sequential Reasoning (RG): The ability to reason logically using known premises and principles This ability also is known as deductive reasoning or rule application.

Quantitative reasoning (RQ): The ability to reason with quantities, mathematical relations, and operators.





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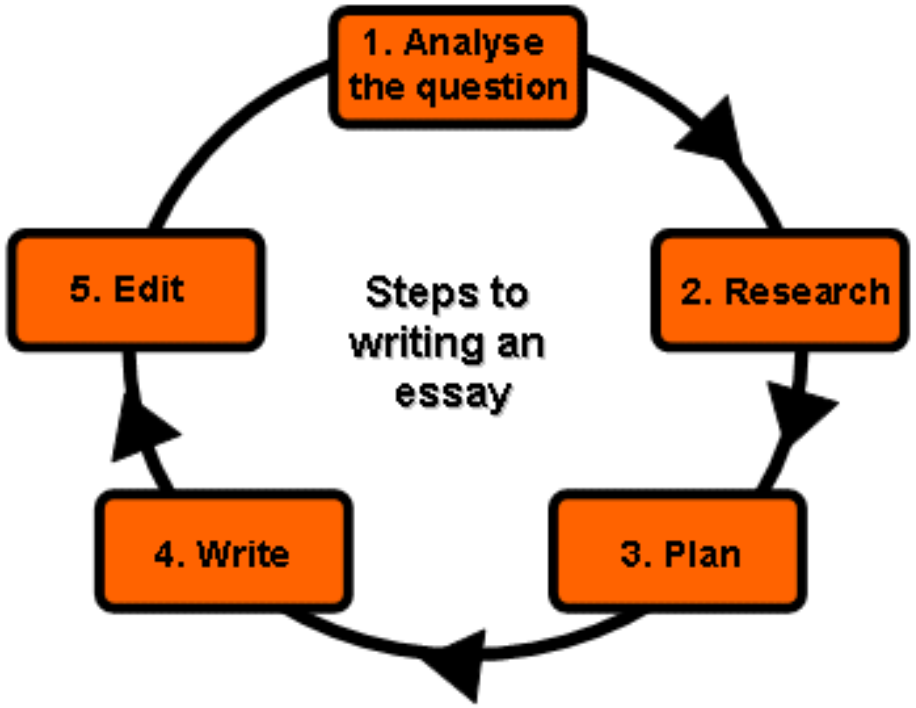
Relations between Gf and Reading Achievement

Gf – Induction (I) and general sequential reasoning (RG) play a moderate role in ***reading comprehension***

Executive functions ***– planning, organization, and self-monitoring are also important***

Relations between Gf and Math and Writing Achievement



Quantitative Reasoning (RQ) consistently related to math achievement

Executive functions, such as set shifting and cognitive inhibitions are also important

Induction (I) and **General Sequential Reasoning (RG; Deduction)** consistently related to written expression

Executive functions, such as attention, planning, and self-monitoring are also important.

Rapid Reference 1.5 General and Specific Manifestations of Fluid Reasoning (Gf) Weaknesses

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition	General Manifestations of Cognitive/ Neuropsychological Weakness	Specific Manifestations of Cognitive/ Neuropsychological Weakness
Fluid Reasoning (Gf)	Novel reasoning and problem solving; ability to solve problems that are unfamiliar. Processes are minimally dependent on prior learning. Involves manipulating rules, abstracting, generalizing, and identifying logical relationships. Fluid reasoning is evident in inferential reasoning, concept formation, classification of unfamiliar stimuli, categorization, and extrapolation of reasonable estimates in ambiguous situations (Schneider & McGrew, 2012). Narrow Gf abilities include Induction, General Sequential Reasoning (Deduction), and Quantitative Reasoning.	***Difficulties with:*** Higher-level thinking and reasoning Transferring or generalizing learning Deriving solutions for novel problems Extending knowledge through critical thinking Perceiving and applying underlying rules or process(es) to solve problems	***Reading Difficulties:*** Drawing inferences from text Abstracting main idea(s) ***Math Difficulties:*** Reasoning with quantitative information (word problems) Internalizing procedures and processes used to solve problems Apprehending relationships between numbers ***Writing Difficulties:*** Essay writing and generalizing concepts Developing a theme Comparing and contrasting ideas

See Chapter 4 in *Essentials of Cross-Battery Assessment* (Flanagan, Ortiz, & Alfonso, 2013)
See Chapter 1 in *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (Mascolo, Alfonso, & Flanagan, 2014)

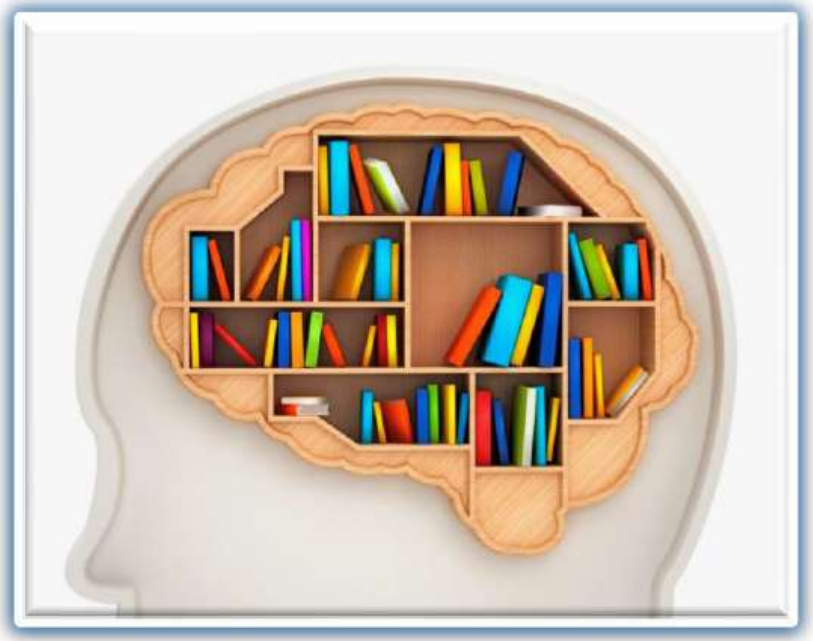
Rapid Reference 1.14 Recommendations That May Facilitate Learning and Aid in Bypassing or Minimizing the Effects of a Fluid Reasoning (Gf) Deficit

Classroom Instruction	Instructional Materials	Environmental	Strategies
Use demonstrations to externalize the reasoning process (think-alouds)	Expanded answer keys containing the "reason" for correct/incorrect choices	Problem-solving charts (hanging or taped to desk)	Use metacognitive strategies (mnemonics that are *memorable* and that *accurately represent* the learning task)
Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es)	Guided lists for implementing procedures, formulas	Procedural charts/lists (hanging or taped to desk)	Use tools that help them categorizes objects and concepts to assist in drawing conclusions (e.g., graphic organizers, concept maps)
Offer targeted, explicit feedback	Models/examples	Preferred seating arrangements that provide easy access to a peer model with strong reasoning skills (e.g., for cooperative learning activities)	Listen to and separate the steps in completing a problem from the actual content used in a problem
Offer opportunities for learning formats that allow for reasoning to be modeled for the student (e.g., cooperative learning, reciprocal teaching)	Text features (boldface, italics)		
Compare new concepts to previously learned concepts (same vs. different)	Graphic organizers that allow for a visual depiction of relationships between and among concepts		
Use analogies, similes, metaphors, paired with concrete explanations, to support understanding when presenting tasks (e.g., "We are going to learn our math facts with *lightning speed*, that means we are going to learn them *fast*")	Manipulatives to demonstrate relationships (e.g., part to whole relationships)		

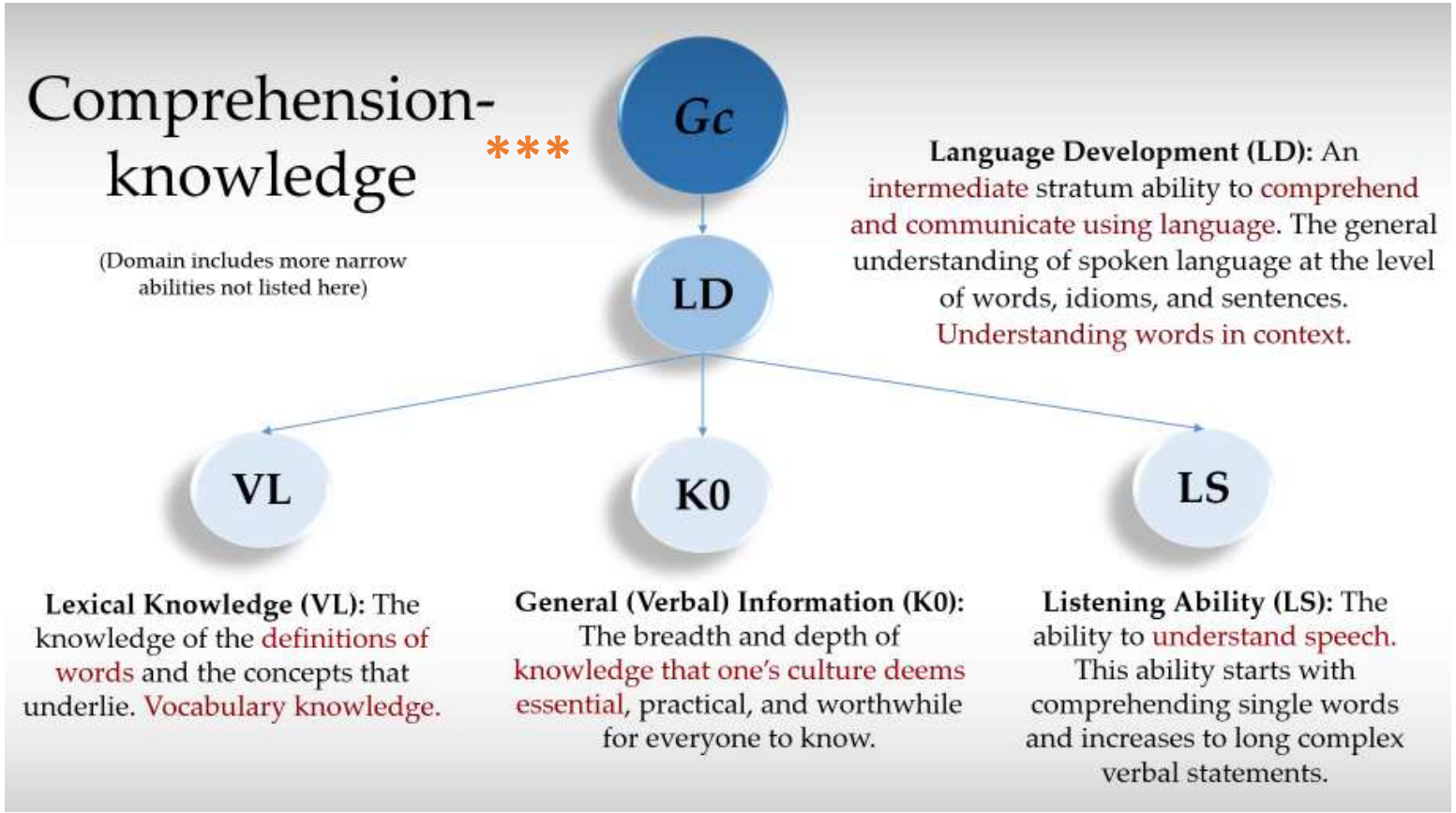
Mascolo, Flanagan, and Alfonso (2014). A systematic method of analyzing assessment results for tailoring interventions (SMAARTI), in Mascolo, Alfonso, & Flanagan, *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (pp. 3-55). Hoboken, NJ: Wiley.

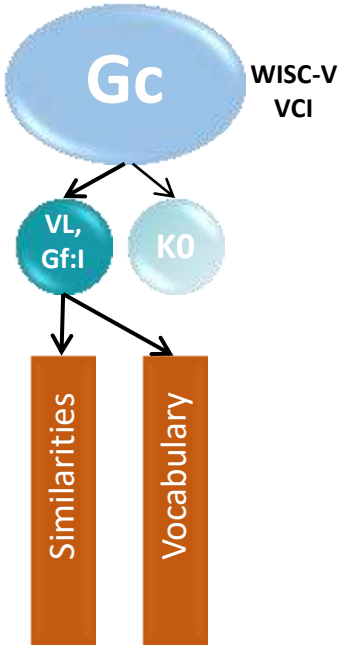
Crystallized Intelligence (Gc) (Now Comprehension-Knowledge)

- a person's knowledge base (or general fund of information) that has built up over time, beginning in infancy.
- *your own personal library or everything you know.*
- Having well developed or good Crystallized intelligence means that one understands and uses language well, has an average or better vocabulary, has good listening skills, and is able to use language well via verbal expression.



A more formal definition: **Comprehension-Knowledge (Gc).** Gc refers to the breadth and depth of knowledge and skills (e.g., words, general information) that are acquired as a result of exposure to language, culture, general life experiences, and formal schooling. It represents the ability to comprehend and communicate culturally-valued knowledge.





****Omitted from this figure are Communication Abilities (CM) and Grammatical Sensitivity (MY)*

CHC Theory Revised: A Visual Graphic Summary of **Schneider and McGrew's** 2018 Chapter in Flanagan & McDonough's (Eds.) *Contemporary Intellectual Assessment*, fourth edition. NY: Guilford. Posted on McGrew's MindHub May 11, 2018. Test classifications added by Flanagan.

Relations between Gc Abilities and Reading Achievement

- ***Gc*** – Language development, including lexical knowledge (VL), general information (K0), communication abilities (CM), and listening ability (LS) are important at all ages. *These abilities become increasingly important with age*

- *Oral Language, Listening Comprehension, and Executive Functions (planning, organization, self-monitoring) also important for reading comprehension*

Relations between Gc Abilities and Math and Writing Achievement

Language development (LD), lexical knowledge (VL), and **listening ability (LS)** are important at all ages for **math problem solving**. These abilities become increasingly important with age.

Language development (LD), lexical knowledge (VL), and general information (K0) are important primarily after about the 2nd grade. These abilities become increasingly important with age. Level of knowledge of syntax, morphology, semantics, and VL has a significant impact on clarity of **written expression** and text generation ability.

Rapid Reference 1.6 General and Specific Manifestations of Crystallized Intelligence (Gc) Weaknesses

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition	General Manifestations of Cognitive/ Neuropsychological Weakness	Specific Manifestations of Cognitive/ Neuropsychological Weakness
Crystallized Intelligence (Gc)	Breadth and depth of knowledge and skills that are valued by one's culture. Developed through formal education as well as general learning experiences. Stores of information and declarative and procedural knowledge. Reflects the degree to which a person has learned practically useful knowledge and mastered valued skills (Schneider & McGrew, 2012). Narrow Gc abilities include General Verbal Information, Language Development, Lexical Knowledge, Listening Ability, Information about Culture, Communication Ability, and Grammatical Sensitivity.	***Difficulties with:*** Vocabulary acquisition Knowledge acquisition Comprehending language or understanding what others are saying Fact-based/informational questions Using prior knowledge to support learning Finding the right words to use/say	***Reading Difficulties:*** Decoding (e.g., word student is attempting to decode is not in his/her vocabulary) Comprehending (e.g., poor background knowledge about information contained in text) ***Math Difficulties:*** Understanding math concepts and the "vocabulary of math" ***Writing Difficulties:*** Grammar (syntax) Bland writing with limited descriptors Verbose writing with limited descriptors Inappropriate word usage ***Language Difficulties:*** Understanding class lessons Expressive language—"poverty of thought"

See Chapter 4 in *Essentials of Cross-Battery Assessment* (Flanagan, Ortiz, & Alfonso, 2013)
See Chapter 1 in *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (Mascolo, Alfonso, & Flanagan, 2014)

Rapid Reference 1.15 Factors That May Facilitate Learning and Aid in Bypassing or Minimizing the Effects of a Crystallized Intelligence (Gc) Deficit

Classroom Instructional Factors	Instructional Materials	Environmental Factors	Strategies
Provides an environment rich in language and experiences	Contains chapter Glossaries	Word-of-the-day calendar	Use KWL strategy to increase background knowledge
Incorporates frequent practice with and exposure to words	E-Glossaries available	Word walls	Use context when reading to ascertain meaning
Reads aloud to children	Provides vocabulary building activities (print or online)		Capitalize on opportunities to practice new words (listening for their use in television shows and other media, purposely using them in conversation)
Varies reading purpose (leisure, information)	Contains tools for priming background knowledge (e.g., Harcourt)	Distraction-free seating	Engage in activities such as word searches containing related terms (e.g., travel terms) and crosswords (note: puzzlemaker.com can create customized puzzles)
Works on vocabulary building	Includes story starters	Closed doors	Write a new word and its definition along with a drawing
Teaches morphology	Includes text features (boldface, italics)	Closed windows	
Capitalizes on opportunities to define words within instruction (e.g., "the *composition* of igneous rock, that is, *what it is made* of, is. . .")	Availability of video clips		

Mascolo, Flanagan, and Alfonso (2014). A systematic method of analyzing assessment results for tailoring interventions (SMAARTI), in Mascolo, Alfonso, & Flanagan, *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (pp. 3-55). Hoboken, NJ: Wiley.

Gc Continued

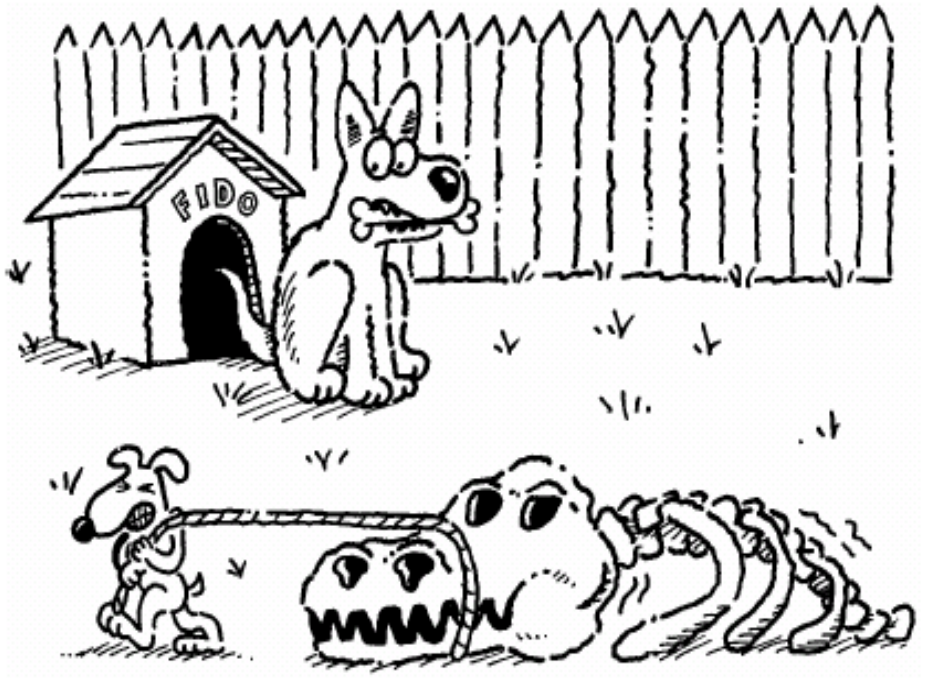
Rapid Reference 1.15 Factors That May Facilitate Learning and Aid in Bypassing or Minimizing the Effects of a Crystallized Intelligence (Gc) Deficit

Includes supportive modalities (e.g., visuals, gestures) to increase understanding of language used	Audio glossaries
Embeds instruction within a meaningful context (e.g., relating words to learner experiences, increasing listening ability through game-like format)	Dictionaries
Develops vocabulary through naturalistic extension of language (e.g., if a student asks, "Can I *start* my work," the teacher might respond, "Yes, you can *begin* your work," naturally building synonym knowledge)	Thesaurus
Uses extension and expansion strategies (Mather, Lynch, & Richards, 2001)	Encyclopedias
	Use vocabulary cartoons (Burchers, 2000)
	Use text talks

Sight Word Development Aided by Visual Images and Multiple Associations

COLOSSAL
(kuh LOS ul) *adj.*
enormous, gigantic; huge in size, extent or degree

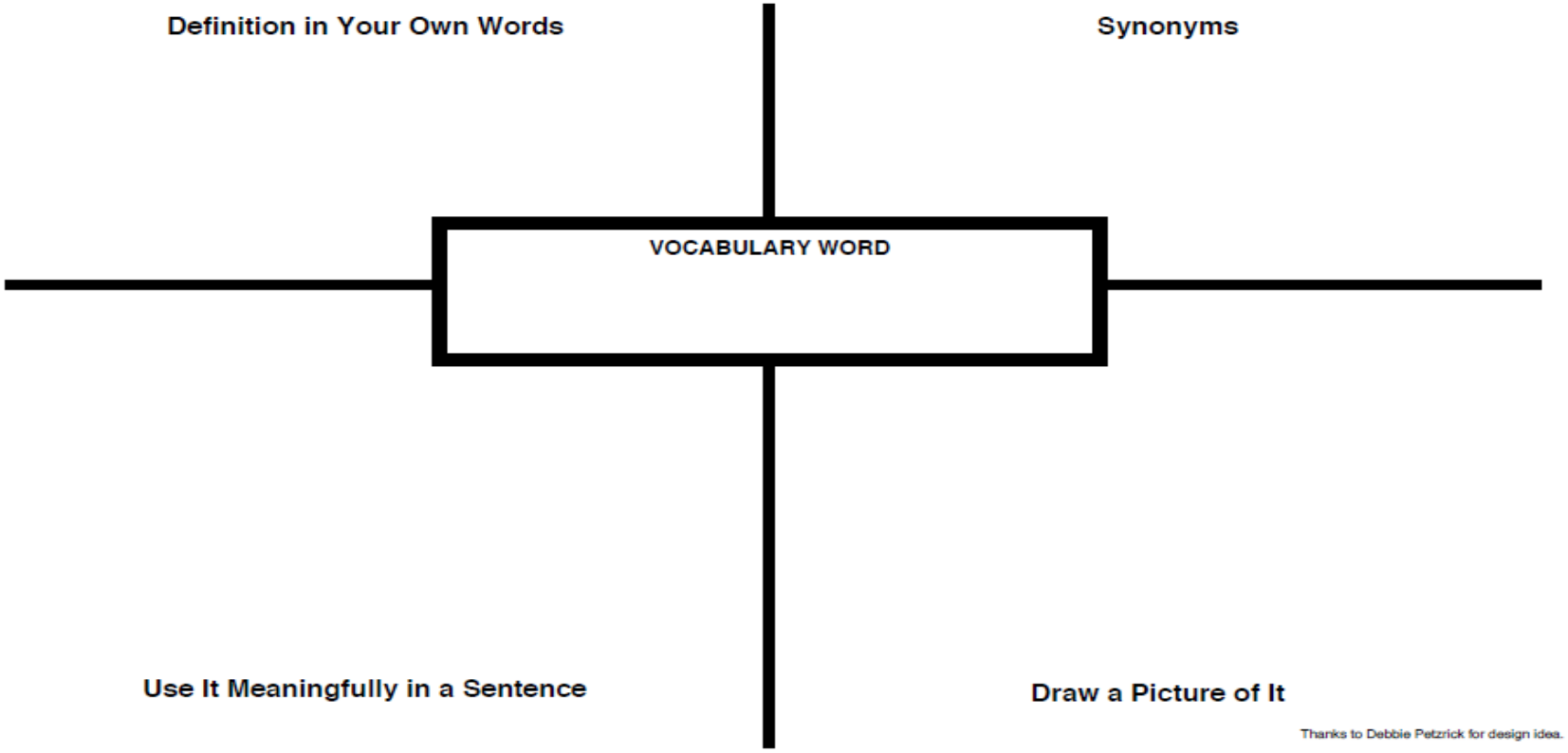
Sounds like: **FOSSIL**



"A COLOSSAL FOSSIL."

Sight Word Development Aided by Visual Images and Multiple Associations

VOCABULARY WORD MAP



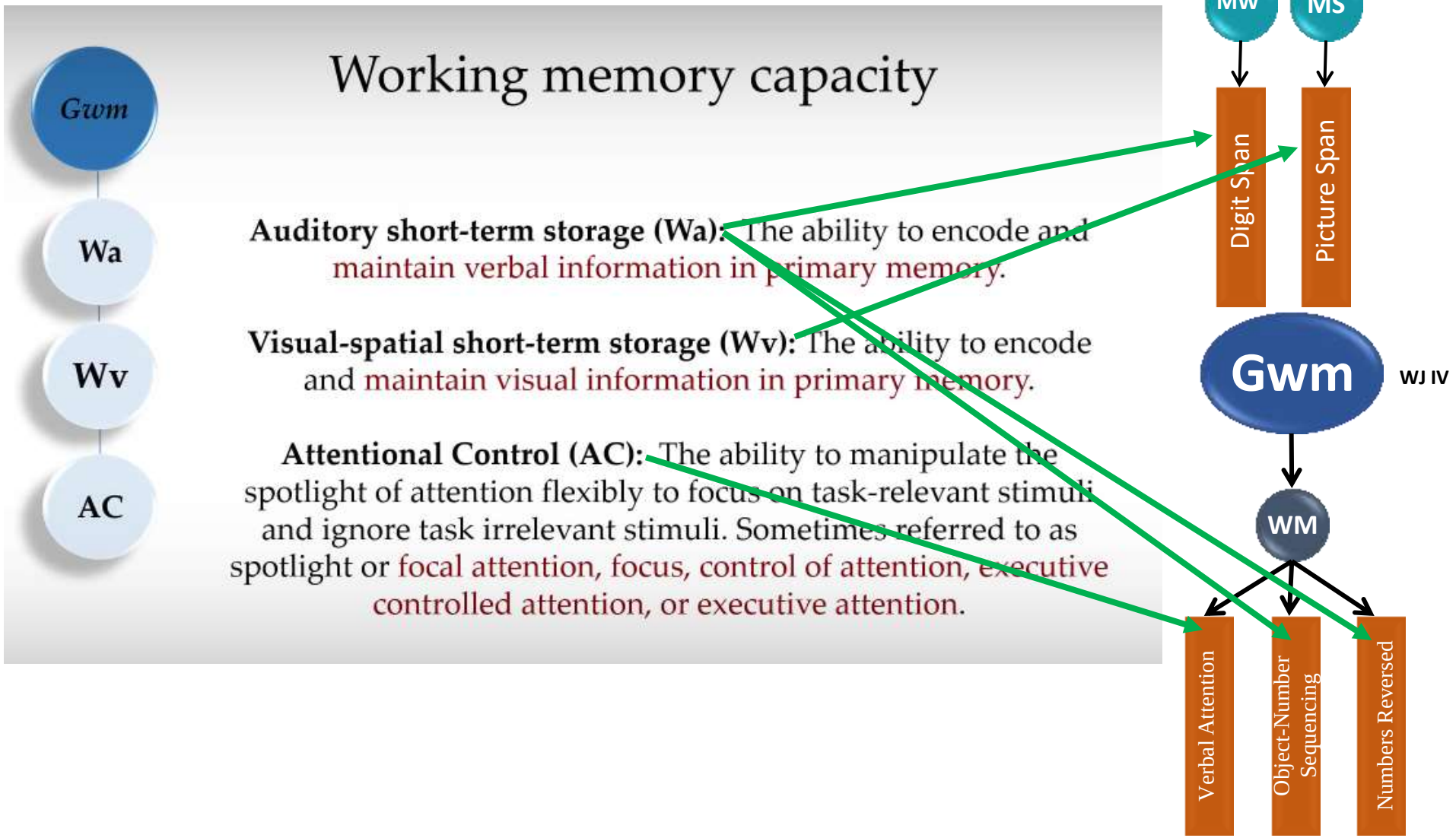
Thanks to Debbie Petzrick for design idea.

Short-term (Working) Memory (Gsm)
Now Working Memory Capacity (Gwm)

- Short-term working memory (Gsm) is the ability to hold information in one's mind and then use it within a few seconds.
  - holding a phone number in one's mind long enough to dial it.
  - Manipulating or transforming information and using it in some way (e.g., saying the months of the year backwards).
- ***Now know as Working Memory Capacity (Gwm)***
  - The ability to encode and maintain verbal or visual information in immediate awareness and then manipulate or transform it in some way within a few seconds, which is dependent in part on focus of attention. It also includes the ability to focus attention on task-relevant stimuli and ignore task irrelevant stimuli.

Sample Items From The Letter-Number Sequencing Test

	Item	Correct response
LNS-Forward	9 – A – 6 – J – 3 – P	9 – A – 6 – J – 3 – P
LNS-Reordered	E – 1 – R – 8 – M – 7	1 – 7 – 8 – E – M - R



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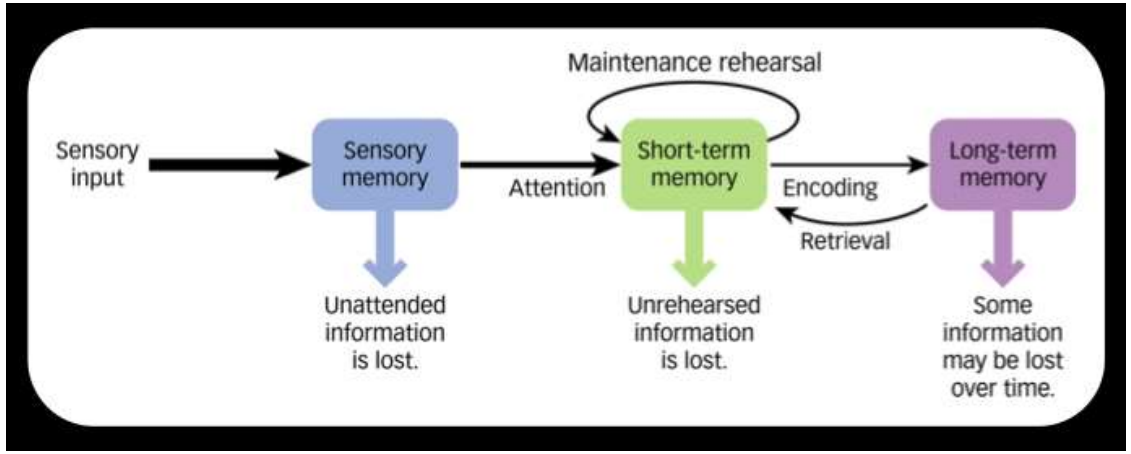
Working Memory Capacity (Gwm)

- A child with limited memory capacity may have a hard time
  - Following directions
  - understanding long reading passages (e.g., a story read aloud by the teacher)
  - Spelling
  - sounding out words
  - and doing math problems (e.g., remembering the steps required to solve long math problems)
- These children do better when they are *taught how to use strategies* to help them remember things.
  - Mnemonics

Relations between Gwm and Achievement

- ***Gwm*** – Working memory capacity is important at all ages



Reading

Working memory capacity, including attentional control**.** **Gwm important for overall reading** success**.** **Phonological memory** (or Memory for Sound Patterns) for verbal and sound-based information may also be important.

Math

Working memory capacity, including attentional control**.** **Gwm important for math problem solving** and overall success in math.

Writing

Memory span is important to writing, especially **spelling** skills; working memory capacity is related to advanced writing skills (e.g., **written expression; ** synthesizing multiple ideas, ongoing self-monitoring). Gwm important for overall writing success.

Rapid Reference 1.11 General and Specific Manifestations of Short-Term Memory (Gsm) Weaknesses

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition	General Manifestations of Cognitive/ Neuropsychological Weakness	Specific Manifestations of Cognitive/ Neuropsychological Weakness
Short-Term Memory (Gsm)	Ability to hold information in immediate awareness and use or transform it within a few seconds.	***Difficulties with:*** Following multistep oral and written instructions Remembering information long enough to apply it Remembering the sequence of information Rote memorization Maintaining one's place in a math problem or train of thought while writing	***Reading Difficulties:*** Reading comprehension (i.e., understanding what is read) Decoding multisyllabic words Orally retelling or paraphrasing what one has read ***Math Difficulties:*** Rote memorization of facts Remembering mathematical procedures Multistep problems and regrouping Extracting information to be used in word problems ***Writing Difficulties:*** Spelling multisyllabic words Redundancy in writing (word and conceptual levels) Identifying main idea of a story Note-taking

See Chapter 4 in *Essentials of Cross-Battery Assessment* (Flanagan, Ortiz, & Alfonso, 2013)
See Chapter 1 in *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (Mascolo, Alfonso, & Flanagan, 2014)

Rapid Reference 1.20 Factors That May Facilitate Learning and Aid in Bypassing or Minimizing the Effects of a Short-Term Memory (Gsm) Deficit

Classroom Instructional Factors	Instructional Materials	Environmental Factors	Strategies
Offers repetition of information	Practice guides	Color-coded Information	Apply rote strategies (e.g., basic rehearsal, simple repetition) for information to be learned in the short-term
Reviews information and newly presented concepts often	Guided study	Math-facts tables (e.g., multiplication)	Encourage use of relational strategies (e.g., mnemonics)
Delivers information in manageable parts	Online review	Written schedules	Use elaborative rehearsal (associating new information with prior knowledge)
Evidences use of consistent instructional routines	Flash cards	Visual schedules (e.g., pictures)	Semantic rehearsal (creating a sentence using things to be remembered)
Uses meaningful stimuli to assist with encoding and allow for experiential learning (i.e., learning while doing)	Multisensory materials to facilitate encoding	Written reminders (homework)	Chunking
Provides opportunities for repeated practice and review			Paraphrasing
Provides supports (e.g., lecture notes, guided notes, study guides, written directions) to supplement oral instruction			Visual mnemonics (imagery, pegwords, loci, keyword method; Dehn)

Mascolo, Flanagan, and Alfonso (2014). A systematic method of analyzing assessment results for tailoring interventions (SMAARTI), in Mascolo, Alfonso, & Flanagan, *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (pp. 3-55). Hoboken, NJ: Wiley.

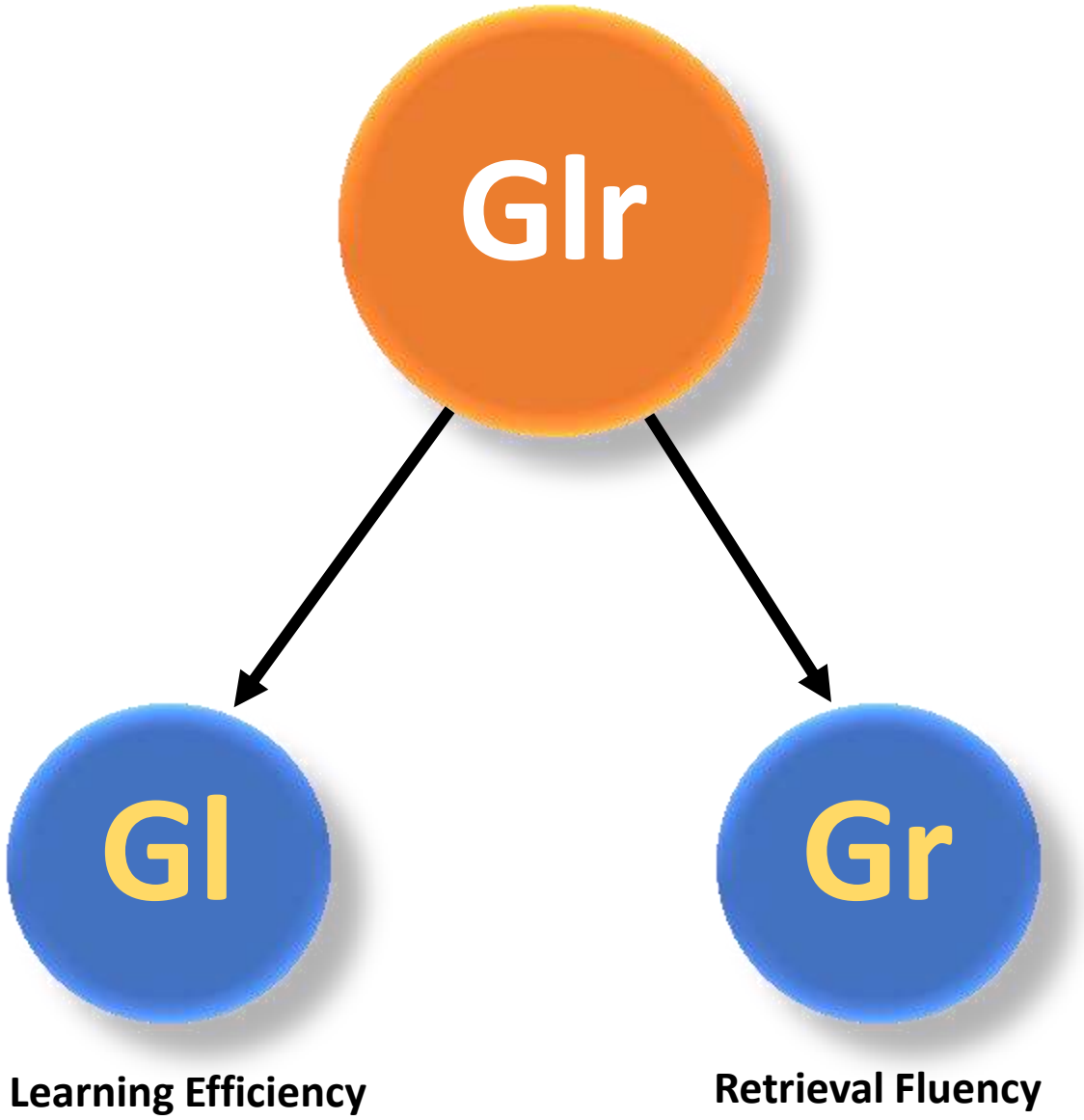
Long-term Storage and Retrieval (Glr)

- Refers to an individual's ability to take in and store a variety of information (e.g., ideas, names, concepts) in one's mind and then retrieve it quickly and easily at a later time by using association.

What is Long-term Storage and Retrieval (Glr)?

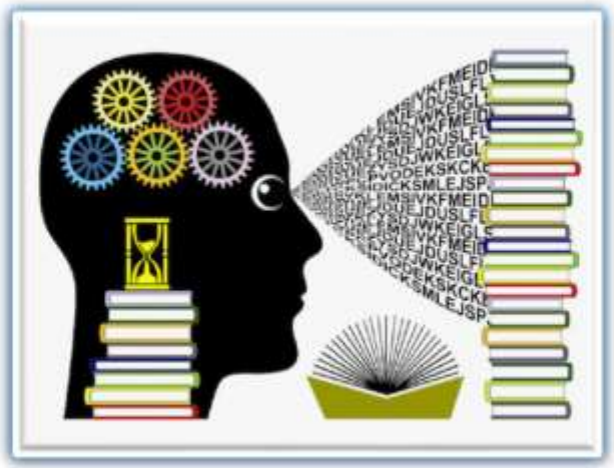
- This ability does not represent *what* is stored in long-term memory or what you know. Rather, it represents the *process* of storing and retrieving information.
- When someone says, “It’s on the tip of my tongue,” they are having a hard time retrieving something that they know.

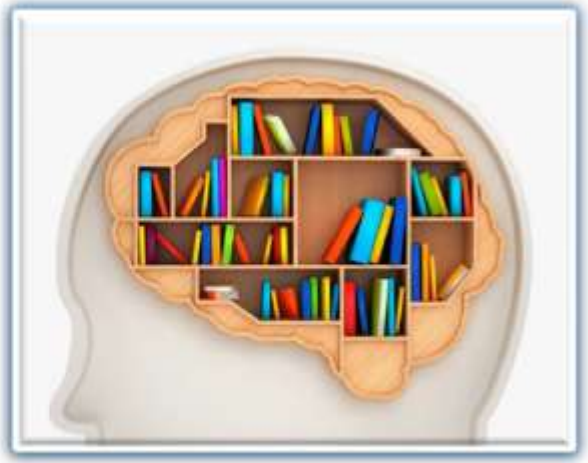
Long-term Storage and Retrieval Has Been Separated Because it has been Shown that it Encompasses Two Relatively Distinct Abilities



Learning efficiency

The ability the ability to learn, store, and consolidate new information over periods of time measured in minutes, hours, days, and years.





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Learning efficiency

Gl

MM

MA

Associative memory (MA): The ability to form a link between two previously unrelated stimuli such that the subsequent presentation of one of the stimuli serves to activate the recall of the other stimuli.

Meaningful memory (MM): The ability to remember narratives and other forms of semantically related information.

Gl: MA — **WISC-V STI**

- Immediate Symbol Translation
- Delayed Symbol Translation
- Recognition Symbol Translation

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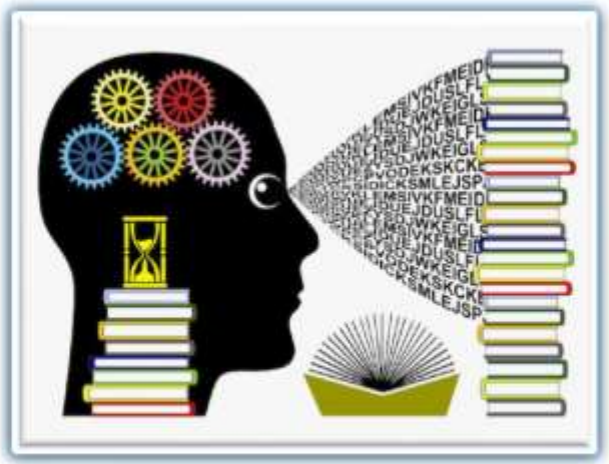
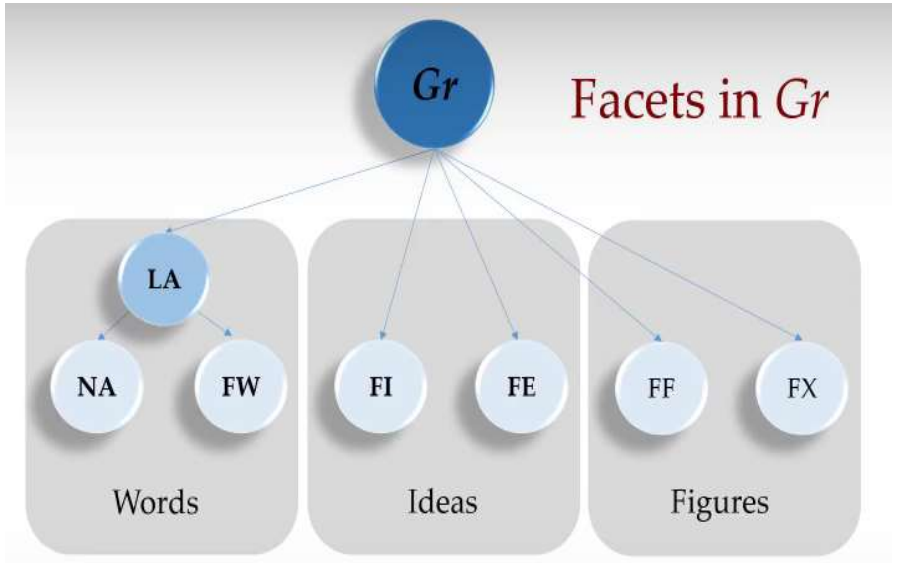
Gr

Retrieval fluency

The rate and fluency at which individuals can access information stored in long-term memory.



Speed of lexical access (LA): The ability to rapidly retrieve words from an individual's lexicon. Verbal efficiency or automaticity of lexical access. An intermediate stratum level ability.

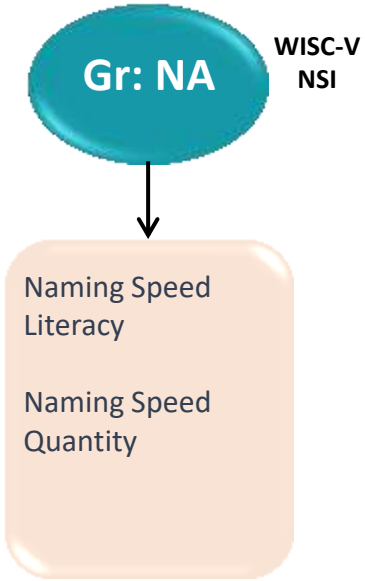


Naming facility (NA): The ability to rapidly call objects by their names.

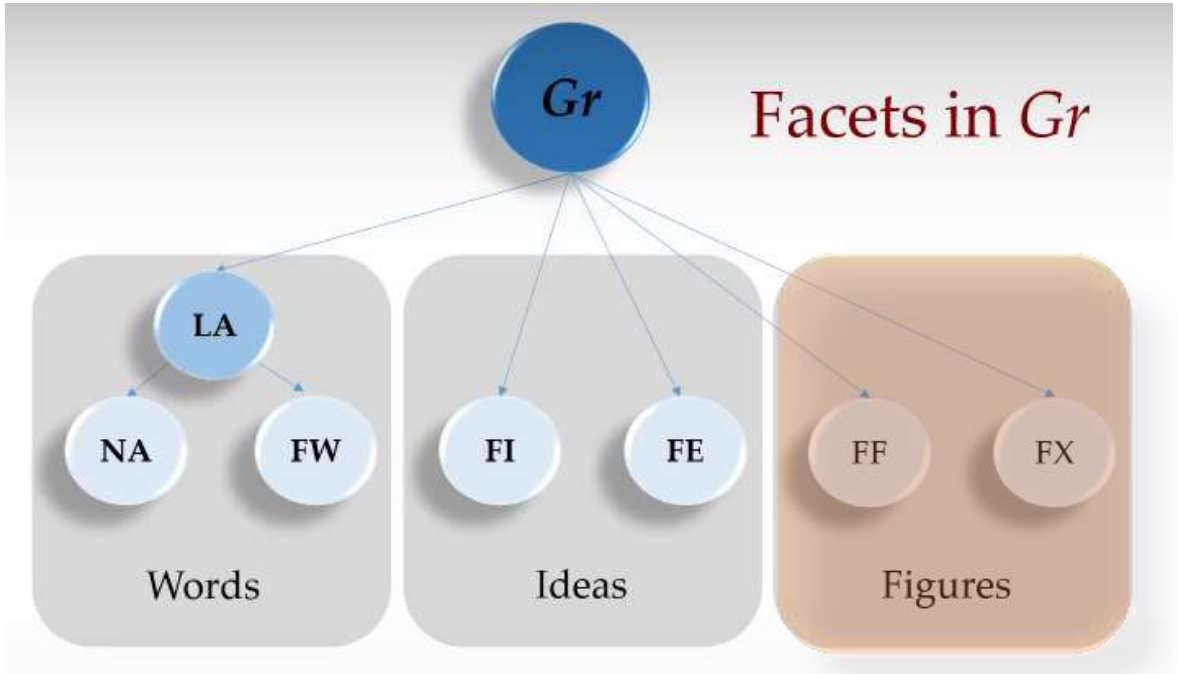
Word fluency (FW): The ability to rapidly produce words that share a phonological (e.g., fluency of retrieval of words via a phonological cue) or semantic feature (e.g., fluency of retrieval of words via a meaning-based representation).

Ideational fluency (FI): The ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object.

Expressional fluency (FE): The ability to rapidly think of different ways of expressing an idea.



Speed of lexical access (LA): The ability to rapidly retrieve words from an individual's lexicon. Verbal efficiency or automaticity of lexical access. An intermediate stratum level ability.

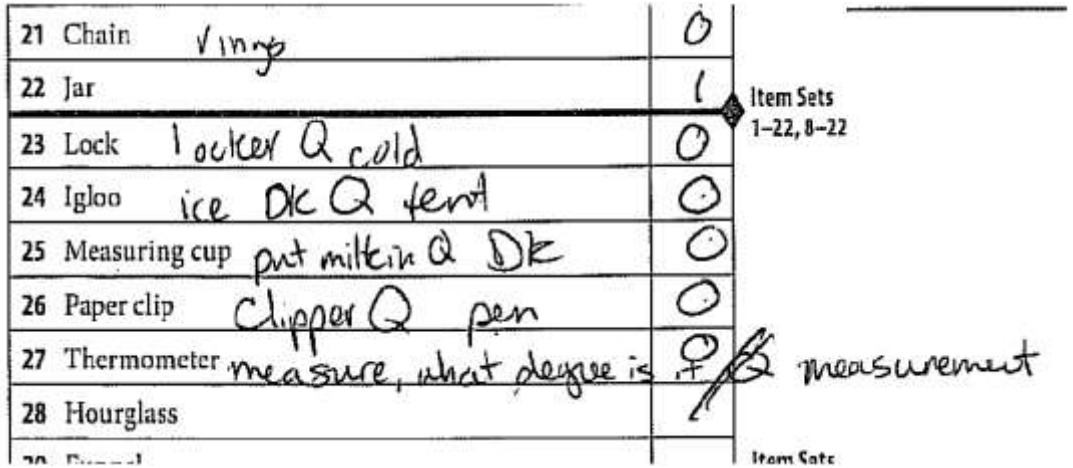


Figural fluency (FF): The ability to rapidly draw or sketch as many things (or elaborations) as possible when presented with a nonmeaningful visual stimulus (e.g., a set of unique visual elements).

Figural flexibility (FX): The ability to rapidly draw different solutions to figural problems.

Evaluation of *Vocabulary Knowledge - Gc* (Looking for an Exact Word)

- DAS-II Naming Vocabulary = 7
- CELF-4 Expressive Vocabulary **75**



21	Chain — ring	0
22	Jar	1
23	Lock — locker Q cold	0
24	Igloo — ice DK Q tent	0
25	Measuring cup — put milk in Q DK	0
26	Paper clip — clipper Q pen	0
27	Thermometer — measure, what degree is it Q	0
28	Hourglass	

Item Sets 1–22, 0–22

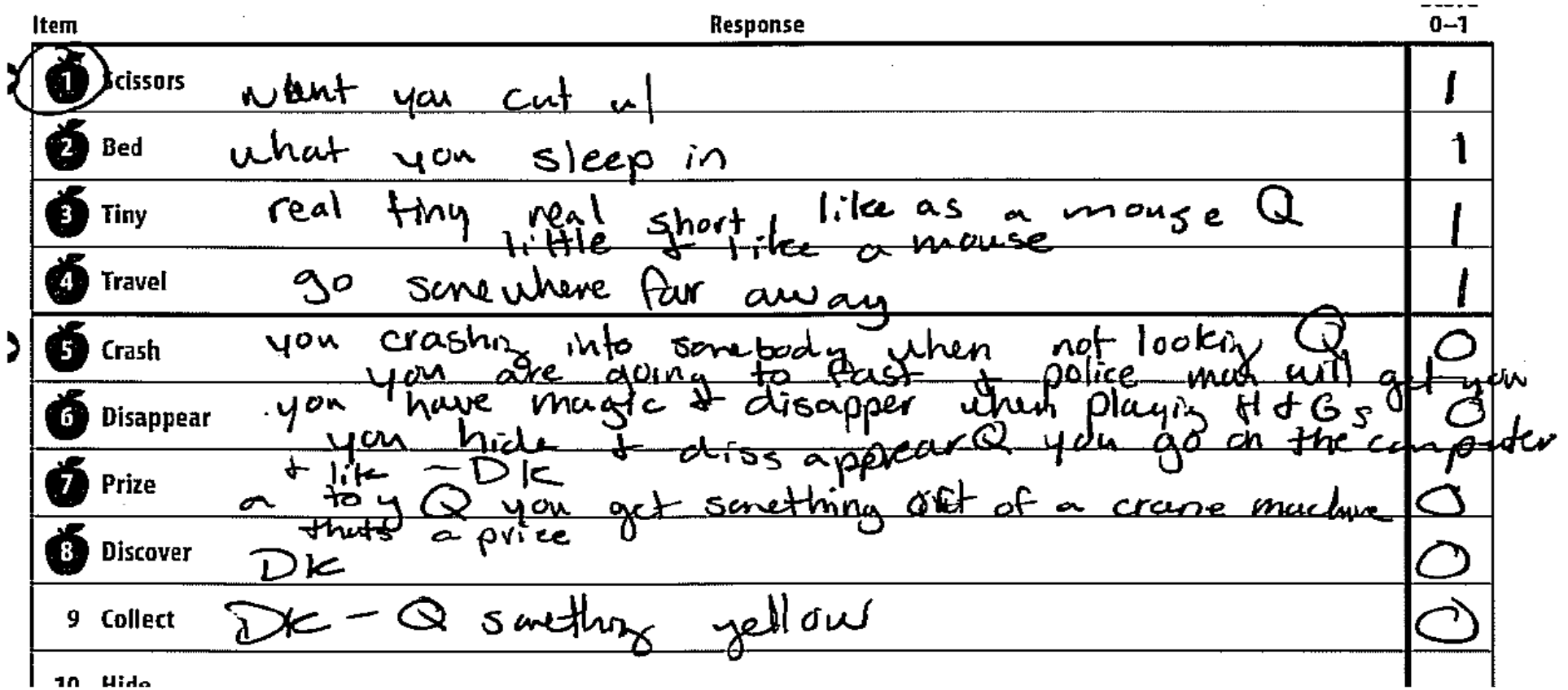
measurement

16.	bowling pin — bowling ball	2 1 (0)
19.	thermometer, termometer, 'mometer — measuring like ... IDK	2 1 (0)
20.	scale, weighing scale, weight scale — foot step where you see how much pounds you weigh	2 1 (0)

Retrieval Difficulties? - Glr

Evaluation of *Vocabulary Knowledge* – Gc (Looking for a Definition of a Word)

- DAS-II Word Definitions = **90**

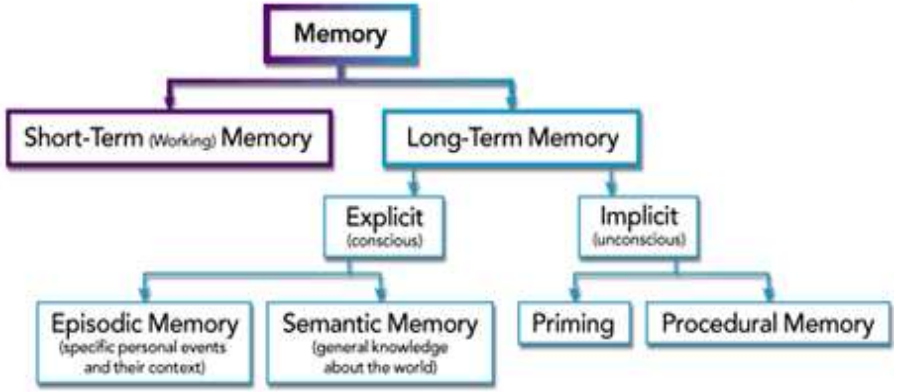


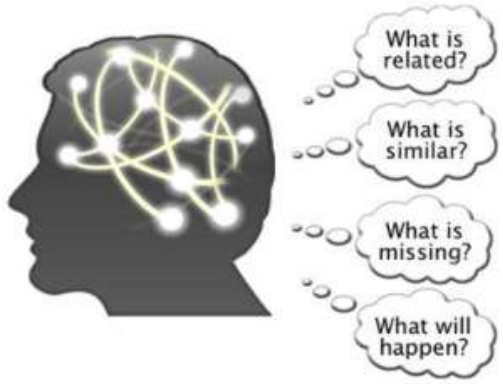
Item		Response	0–1
1	Scissors	what you cut w/	1
2	Bed	what you sleep in	1
3	Tiny	real tiny real short little & like as a mouse like a mouse Q	1
4	Travel	go somewhere far away	1
5	Crash	you crash into somebody when not looking Q you are going to fast & police man will get you	0
6	Disappear	you have magic & disapper when playing H & G's Q you hide & diss appear Q you go on the computer & like — DK	0
7	Prize	a toy Q you get something out of a crane machine that's a price	0
8	Discover	DK	0
9	Collect	DK — Q something yellow	0
10	Hide		

Broader parameters; Can give enough information to show understanding

Relations between Gl and Gr and Achievement

Naming facility (NA) or "rapid automatic naming" (a Gr ability) is very important during the elementary school years. Associative memory (MA; a Gl ability) also appears to be important in the early elementary school years.





Reading

Naming facility (NA) or "rapid automatic naming" (RAN) (also called speed of lexical access) is very important during the elementary school years for reading rate and fluency**.** Associative memory (MA) is also important.

Math

Naming Facility (NA; or speed of lexical access); Associative Memory (MA) – memorization and rapid retrieval of basic math facts; accurate and fluent calculation**.**

Writing

Naming facility (NA) or "rapid automatic naming" (also called speed of lexical access) has demonstrated relations with written expression, primarily writing fluency. Storing and retrieving commonly occurring letter patterns in visual and motor memory are needed for spelling.

Rapid Reference 1.8 General and Specific Manifestations of Long-Term Retrieval (Glr) Weaknesses

CHC Broad Cognitive Abilities/ Neuropsychological Functions	Brief Definition	General Manifestations of Cognitive/ Neuropsychological Weakness	Specific Manifestations of Cognitive/Neuropsychological Weakness
Long-Term Retrieval (Glr)	Ability to store information (e.g., concepts, words, facts), consolidate it, and fluently retrieve it at a later time (e.g., minutes, hours, days, and years) through association. In Glr tasks, information leaves immediate awareness long enough for the contents of primary memory to be displaced completely. In other words, Glr tasks (unlike Gsm tasks) do not allow for information to be maintained continuously in primary memory (Schneider & McGrew, 2012). Glr abilities may be categorized as either "learning efficiency" or "fluency." Learning efficiency narrow abilities include Associative Memory, Meaningful Memory, and Free Recall Memory; fluency narrow abilities involve either the production of ideas (e.g., Ideational Fluency, Associational Fluency), the recall of words (e.g., Naming Facility, Word Fluency), or the generation of figures (e.g., Figural Fluency, Figural Flexibility) (Schneider & McGrew, 2012).	***Difficulties with:*** Learning new concepts Retrieving or recalling information by using association Performing consistently across different task formats (e.g., recognition versus recall formats) Rapid retrieval of information Learning information quickly Paired learning (visual-auditory) Recalling specific information (words, facts) Generating ideas rapidly	***Reading Difficulties:*** Accessing background knowledge to support new learning while reading Slow to access phonological representations during decoding Retelling or paraphrasing what one has read ***Math Difficulties:*** Memorizing math facts Recalling math facts and procedures ***Writing Difficulties:*** Accessing words to use during essay writing Specific writing tasks (compare and contrast; persuasive writing) Note-taking Idea generation/production ***Language Difficulties:*** Expressive—circumlocutions, speech fillers, "interrupted" thought, pauses Receptive—making connections throughout oral presentations (e.g., class lecture)

See Chapter 4 in *Essentials of Cross-Battery Assessment* (Flanagan, Ortiz, & Alfonso, 2013)
See Chapter 1 in *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (Mascolo, Alfonso, & Flanagan, 2014)

Rapid Reference 1.17 Factors That May Facilitate Learning and Aid in Bypassing or Minimizing the Effects of a Long-Term Retrieval (Glr) Deficit

Classroom Instructional Factors	Instructional Materials	Environmental Factors	Strategies
Uses close-ended questions, yes/no, true/false	Guided lists for implementing procedures, formulas	Procedural charts	Organizes material to be learned using visual aids (e.g., diagrams, flowcharts), auditory aids (e.g., chunking), or other tangibles (e.g., flash cards)
Uses consistent instructional routines	Practice guides	Word walls	Makes connections by relating material to be learned to oneself
Offers repeated practice with and review of newly presented information	Online review	Desk organizers	Relates concepts to be learned to one another via tools such as a concept map
Teaches memory strategies and encourages their use (verbal rehearsal to support encoding, use of mnemonic devices; Dehn, 2010)	Glossaries (electronic, audio, printed)	External memory aids (lists, audible timers)	Creates a schedule for distributed practice of material to be learned
Uses multiple modalities when teaching new concepts (pair written or visual with verbal information) to support dual recoding (Dehn, 2010)	Study guides	Calendars with visual references to due dates	Plans for regular review of material
Limits the amount of new material to be learned; introduces new concepts gradually and with a lot of context	Review sheets	Visual reminders (Post-its, color-coded systems)	Rehearses material to be learned via recitation, repetition

(continued)

Mascolo, Flanagan, and Alfonso (2014). A systematic method of analyzing assessment results for tailoring interventions (SMAARTI), in Mascolo, Alfonso, & Flanagan, *Essentials of Planning, Selecting, and Tailoring Interventions for Unique Learners* (pp. 3-55). Hoboken, NJ: Wiley.

Summary

- Relations between Selected CHC abilities and Achievement
- How weaknesses manifest in real-world performances
- How to minimize or bypass weaknesses to allow the student greater access to instruction/curriculum

Important Abilities for Learning and Academic Success in Reading

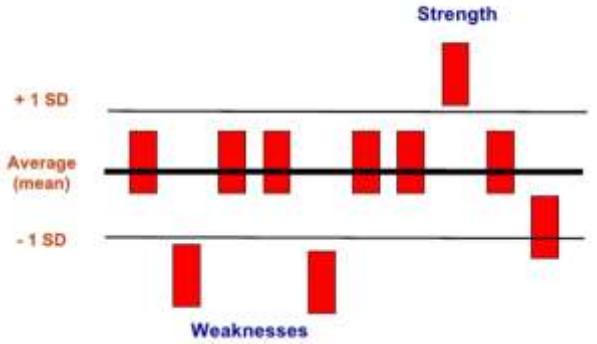
- ***1. Fluid Reasoning (Gf)***
- ***2. Crystallized Knowledge (Gc)***
  - Weaknesses in these abilities *constrain* learning and achievement
- **(Executive Functions** – weaknesses lead to inconsistencies in Learning and Achievement)
- ***3. Short-Term Memory (Gsm) – Working Memory***
- ***4. Long-Term Storage and Retrieval (Glr)***
  - Working Memory, Retrieval Fluency, and Learning Efficiency
  - Weaknesses in these abilities *obstruct* learning and achievement, but can be improved upon, bypassed, or compensated for at least to some degree
- **Important Processes (related to reading)**
  - ***Ga – Phonological Processing (encompasses many skills)***
  - ***Visual Processing/Processing Speed – Orthographic Processing***
    - Train processing deficits to point where they become skill

Important for overall learning and academic success

Important for acquiring basic reading skills

See Flanagan, Ortiz, and Alfonso (2013). *Essentials of Cross-Battery Assessment*, 3e

Interpretation of PSW



- Requires an understanding of contemporary theory
- Requires an understanding of the theoretical constructs that are measured by cognitive batteries
- Requires understanding of cognitive processes and abilities related to achievement
- May require cross-battery assessment to assess all the abilities and processes considered important based on referral and to follow up on aberrant test performances
- Requires understanding of the SLD construct

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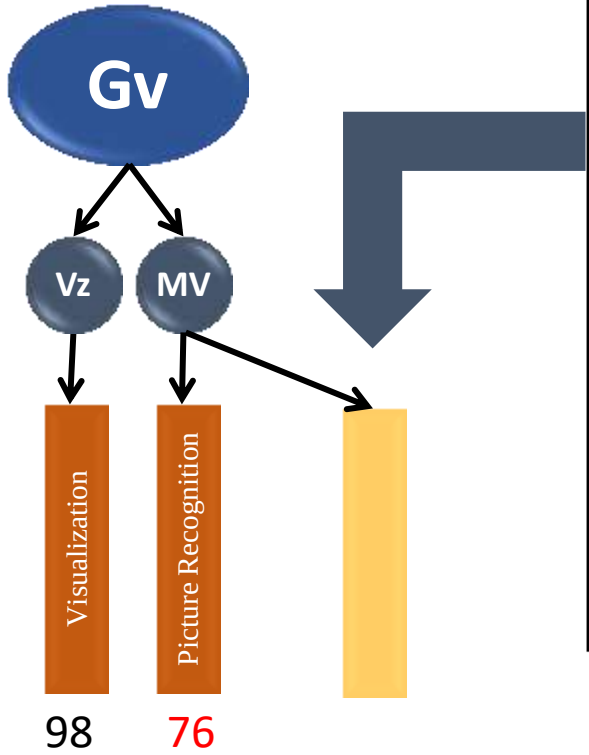
Cross-Battery Assessment

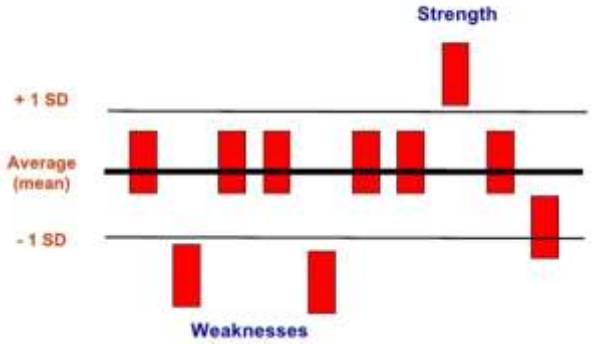
- **Important for**
  - Testing Hypotheses
  - Following up on aberrant score performance
  - Measuring constructs not found on the core battery but considered important based on referral information



Visual Memory (MV)		Age Range
CAS-2	Figure Memory	5-18
DAS-II	Recall of Designs	7-17
DAS-II	Recognition of Pictures	2:6-13:5
KABC-II	Face Recognition	3-5
KBNA	Complex Figure 2	20-89
KBNA	Picture Recognition	20-89
KBNA	Spatial Location	20-89
NAB	Dots	18-97
NAB	Driving Scenes	18-97
NAB	Shape Learning	18-97
NEPSY-II	Memory for Designs	3-16
NEPSY-II	Memory for Faces	5-16
RIAS	Nonverbal Memory	3-94
SIT	Section A	6-17
SIT	Section B	6-17
TOMAL-2	Abstract Visual Memory	5-59
TOMAL-2	Facial Memory	5-59
TOMAL-2	Memory for Location	5-59
TVPS3	Visual Memory	4-18
WJ III NU COG	Picture Recognition	6-90+
WJ IV COG	Picture Recognition	2-80+
WMS-4	Designs I	16-69
WMS-4	Designs II Delayed Recall	16-69
WMS-4	Designs II Recognition	16-69
WMS-4	Spatial Addition	16-69
WMS-4	Visual Reproduction I	16-90
WMS-4	Visual Reproduction II Delayed Recall	16-90
WMS-4	Visual Reproduction II Recognition	16-90
WNV	Recognition	4-7
WRAML2	Design Memory	5-85+
WRAML2	Design Memory Recognition	5-85+
WRAML2	Picture Memory	5-85+
WRAML2	Picture Memory Recognition	5-85+

X-BASS v2.0 (Flanagan, Ortiz, & Alfonso, 2017)

Interpretation of PSW

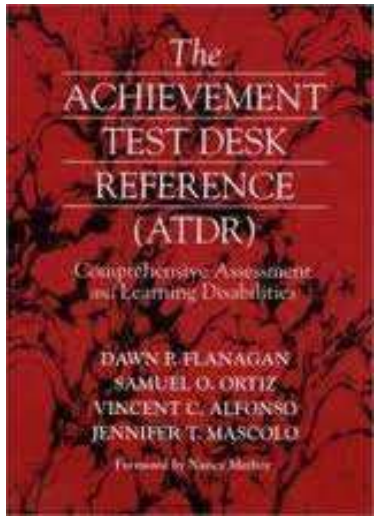


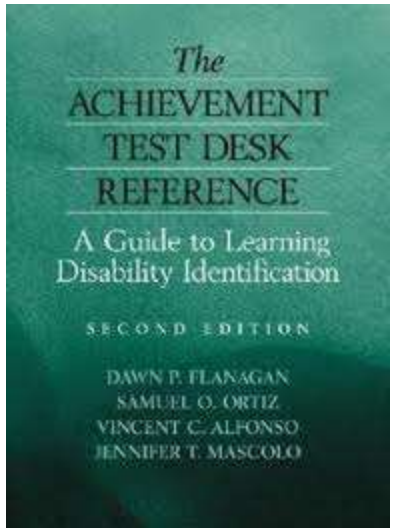
- Requires an understanding of contemporary theory
- Requires an understanding of the theoretical constructs that are measured by cognitive batteries
- Requires understanding of cognitive processes and abilities related to achievement
- May require cross-battery assessment to assess all the abilities and processes considered important based on referral and to follow up on aberrant test performances
- Requires understanding of the SLD construct

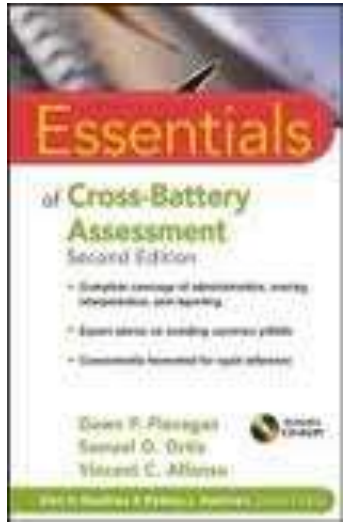
D. P. Flanagan, 2019

An Operational Definition of SLD
Flanagan, Ortiz, Alfonso, and Mascolo

- Definition first presented in 2002 ***(prior to IDEA 2004)***
- Revised and updated in 2006 ***(same time federal regs published)***
- Updated in 2007







An Operational Definition of SLD
Flanagan and Colleagues (2002 – 2018)

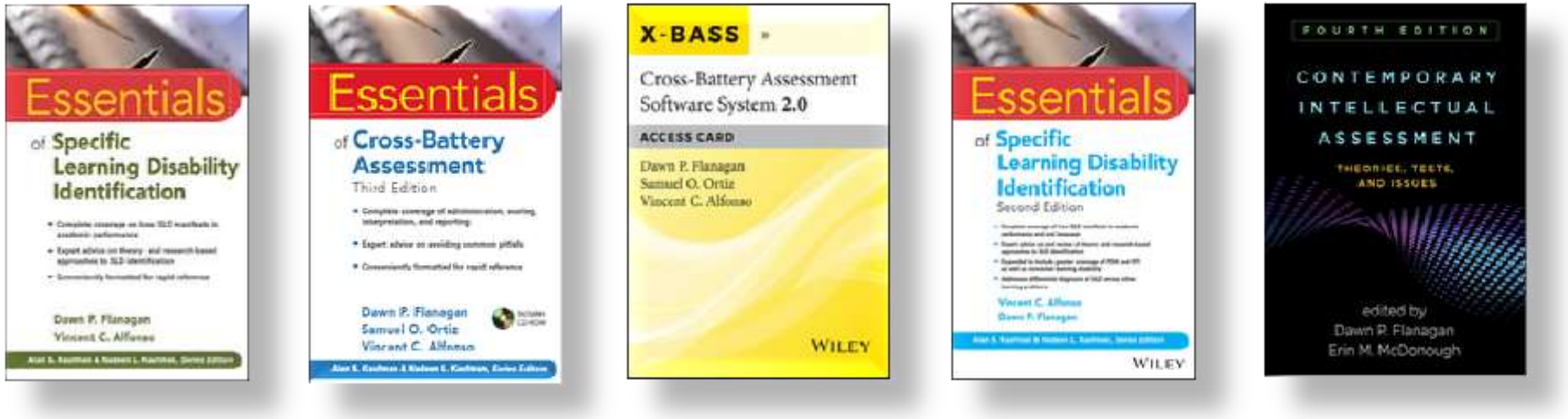
Revised and updated in 2011

Updated in *Essentials of Cross-Battery Assessment*, 3e (2013) and renamed:
Dual Discrepancy/Consistency (DD/C) Method

Operationalized in X-BASS (2017) – most sophisticated and psychometrically defensible PSW model to date

Step-by-Step Guidance on Using X-BASS in SLD Evaluations in SLD book (2018)

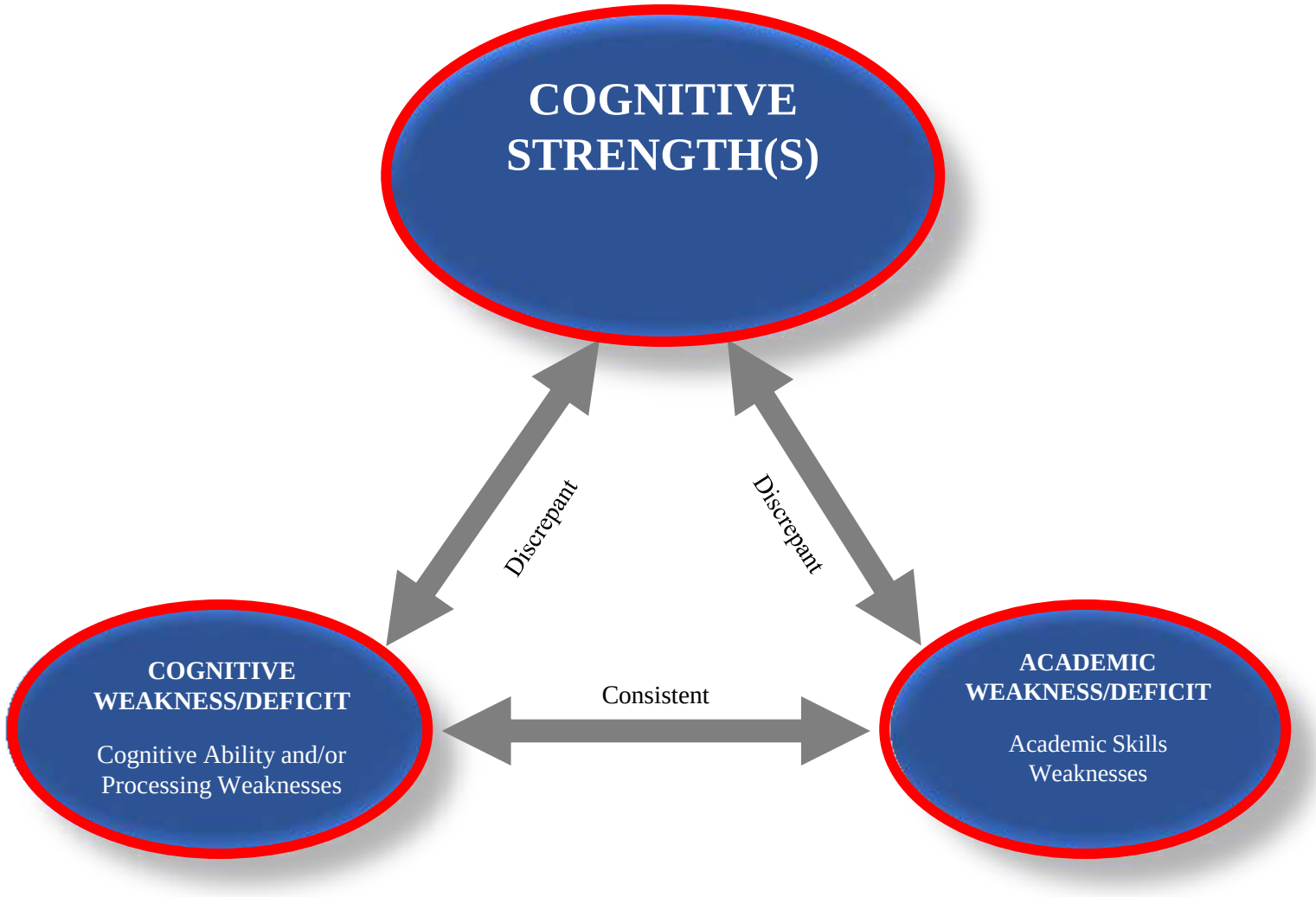
Step-by-Step Guidance on Using X-BASS in SLD Evaluations in CIA 4e book (2018)



Alternative Research-Based Approaches to SLD Identification

- PSW Methods:
  - *Flanagan, Ortiz, Alfonso, & Mascolo (2002-Present)*
    - *Dual-Discrepancy/Consistency (within the context of an Operational Definition of SLD and a broader approach to "best practices" in CHC-based assessment) – automated in X-BASS*
  - *Naglieri, 1999, 2013*
    - *Discrepancy/Consistency (PASS Model; CAS-2 battery) – battery specific*
  - *Hale & Fiorello, 2004, 2011*
    - *Concordance-discordance model (based on neuropsych theory within the context of an hypothesis testing approach) – not automated*
  - *Dehn & Szasz – Psychological Processing Analyzer-5*
    - *(remarkably similar to the PSW-A component of X-BASS, although not as comprehensive, or psychometrically sophisticated, or theoretically driven)*
  - *WISC-V*
    - *two discrepancy comparisons for PSW – automated in WIAT-III, KTEA-III scoring programs*

Conceptual Similarities Among PSW Methods



How Would You Operationalize This Pattern?

Two Automated PSW Methods

WIAT-III/KTEA-3/WISC-V and X-BASS

Q-global Platform

- PSW Analysis available as an option on WIAT-III and KTEA-3 score reports
- Examples and additional handout will be provided at the presentation

Methodological and Statistical Requirements for the PSW Analysis According to WISC-V Technical and Interpretive Manual (p. 183)

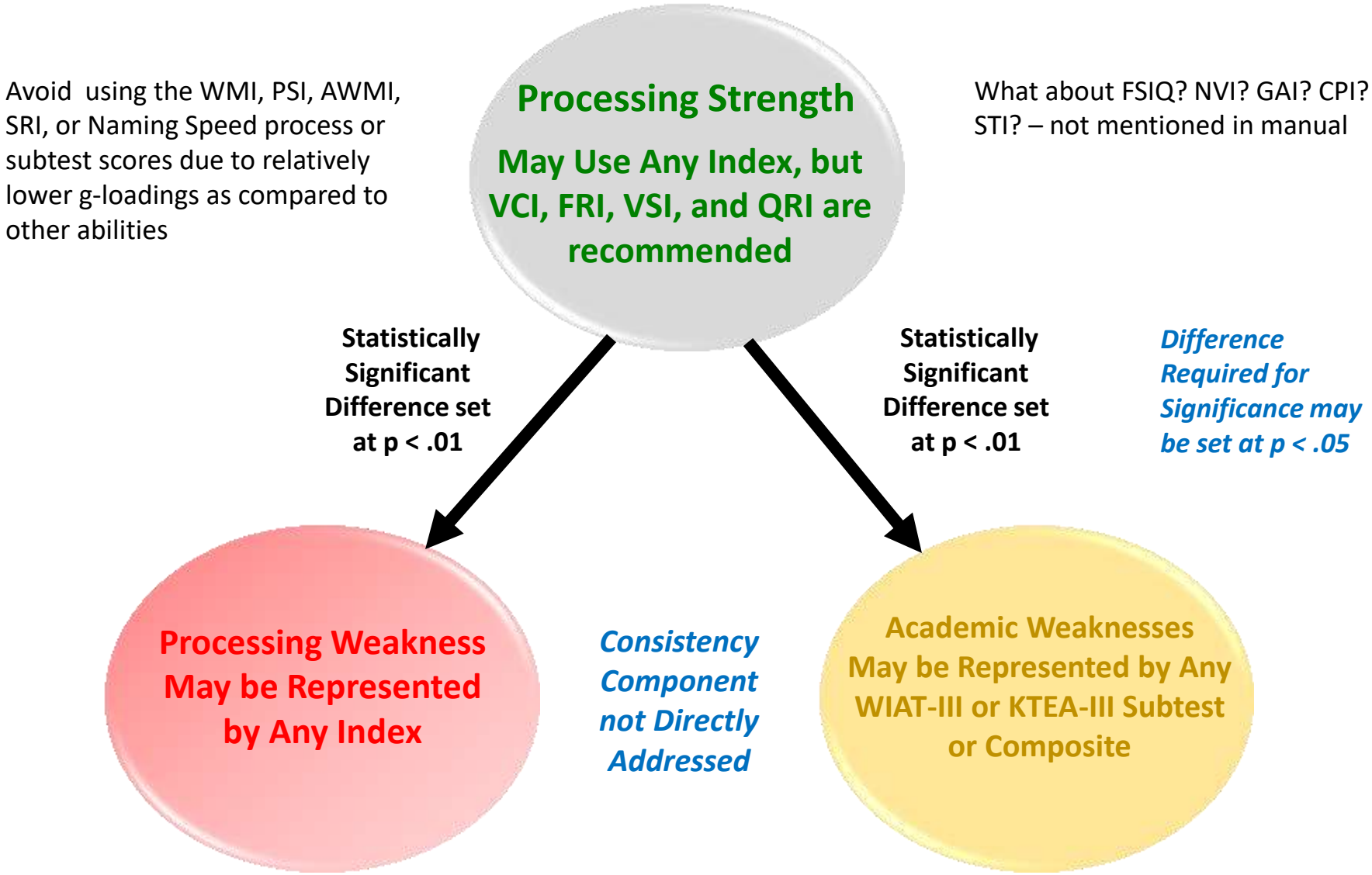
- The scores within each of the following comparisons must be significantly different (discrepant) to fit the model's criteria for SLD identification:
  - **Processing strength vs. achievement weakness**
  - **Processing strength vs. processing weakness**
- A third score comparison requiring consistency between the achievement weakness and the processing weakness ***is not included*** because it is not a statistical requirement of the model for identifying an SLD

Steps for Conducting a PSW Analysis with the WISC-V and WIAT-III or KTEA-3 Using the Q-global Platform

- **Select the individual's primary area of academic weakness (i.e., a subtest or composite score from either the WIAT-III or KTEA-3, depending on which battery was used in the assessment).**
  - Select a weakness that is associated with a standard score below 85, if possible and appropriate
  - Select a subtest or composite that corresponds to one of the eight IDEA-specified areas of SLD
  - If the variability in scores that make up a composite is statistically significant, consider using a subtest score within that composite rather than the composite itself
- **Select the individual's primary area of cognitive processing weakness (based on the WISC-V).**
  - Consider current theory and research to ensure that the cognitive area of weakness is related to the academic area of weakness
  - Use cohesive index scores whenever possible
- **Select the individual's primary area of processing strength (based on the WISC-V).**
  - Avoid using the WMI, PSI, AWMI, Naming Speed process or subtest scores, or SRI
  - Consider selecting a cognitive area of strength that is not typically related to the academic area of weakness
  - Use cohesive index scores whenever possible

***Source*:**

Third Method WISC-V PSW Model



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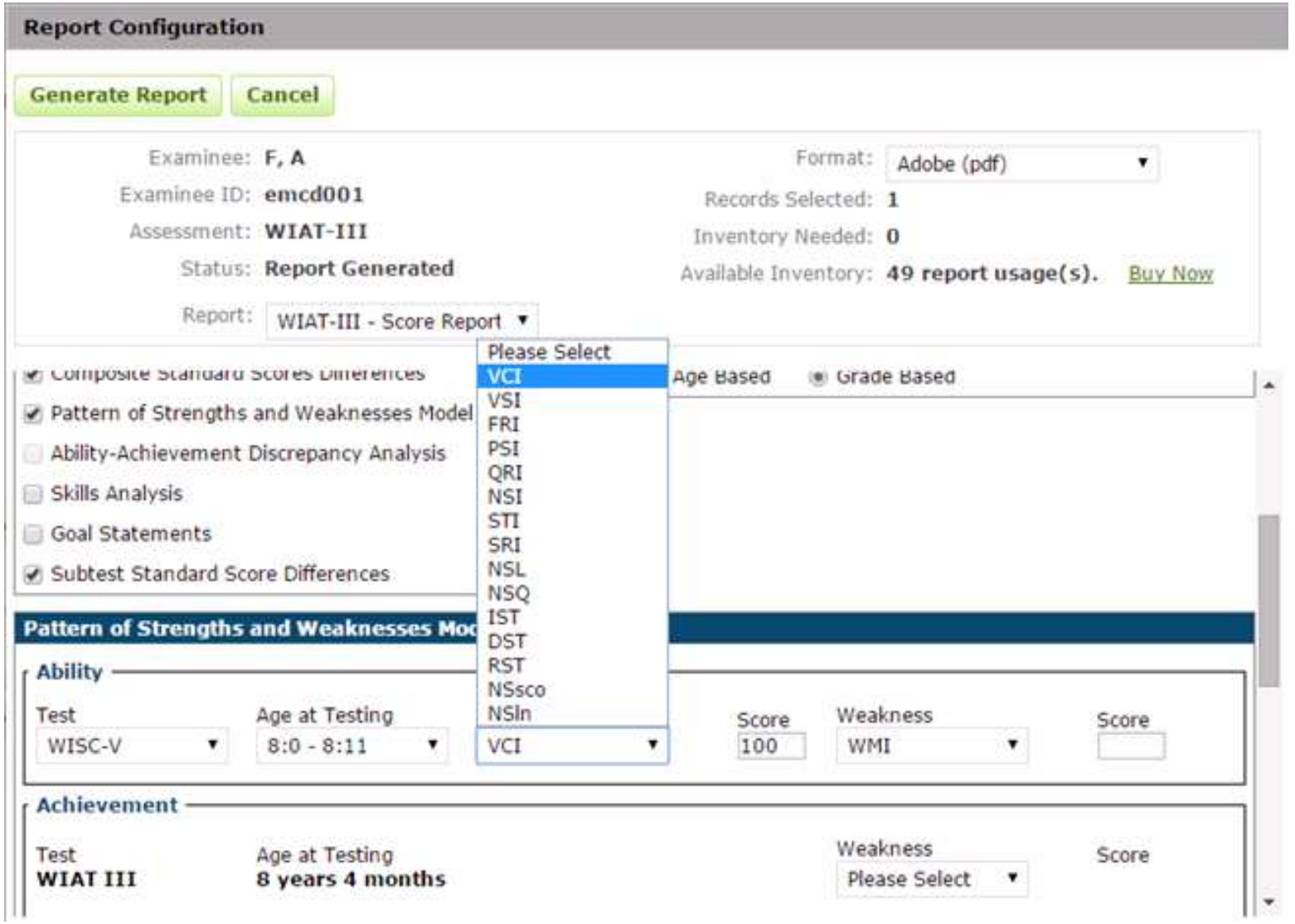
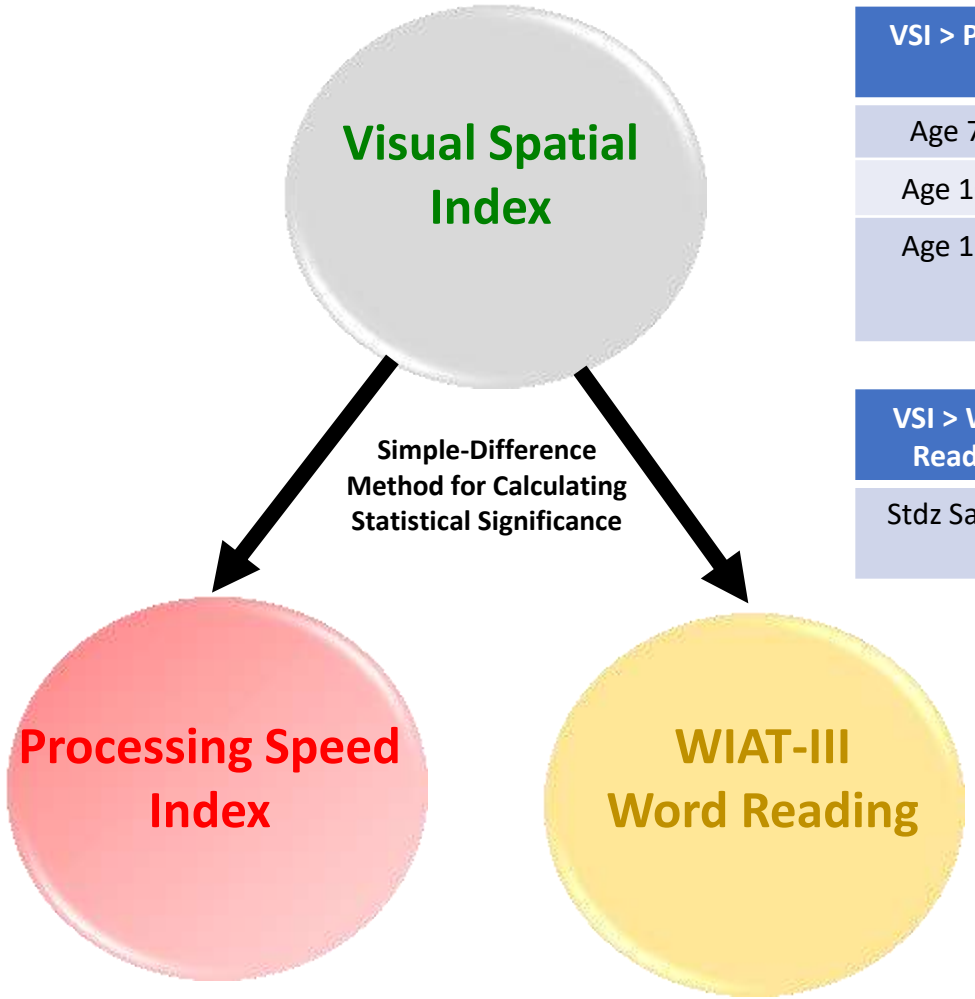
Need KTEA-3 or WIAT-III to Conduct PSW Analysis via Q-Global Score Reports



Third Method WISC-V PSW Model



VSI > PSI	P < .05/.01	Base Rate	Difference needed for Base Rate of ≤ 10%
Age 7	13/17 points	23/16%	22 points
Age 10	14/18 points	22/15%	22 points
Age 13	15/19 points	19/14%	22 points

VSI > Word Reading	P < .05/.01	Base Rate	Difference needed for Base Rate of ≤ 10%
Stdz Sample	10/13 points	>25%/20-25%	23 points

Use of Simple-Difference Method in SLD Identification will Over-Identify Students

D. P. Flanagan, 2019

PATTERN OF STRENGTHS AND WEAKNESSES ANALYSIS

Area of Achievement Weakness	WIAT-III	Basic Reading: 85
Area of Processing Weakness	WISC-V	VSI: 81
Area of Processing Strength	WISC-V	VCI: 100

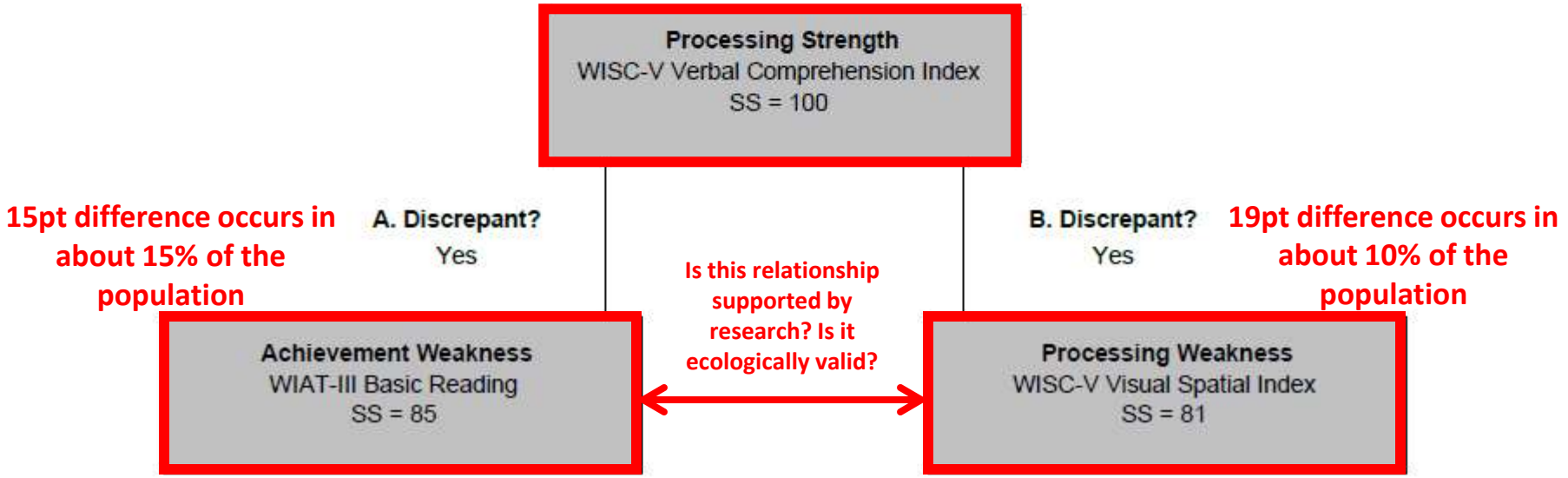
	Comparison	Relative Strength Score	Relative Weakness Score	Difference	Critical Value .05	Significant Difference Y/N	Supports SLD hypothesis? Yes/No
A	Processing Strength/ Achievement Weakness	100	85	15	9.00	Y	Yes
B	Processing Strength/ Processing Weakness	100	81	19	12.00	Y	Yes

The PSW model is intended to help practitioners generate hypotheses regarding clinical diagnoses. The analysis should always be used within a comprehensive evaluation that incorporates multiple sources of information.

Occurs in 20% of the population

Occurs in > 25% of the population

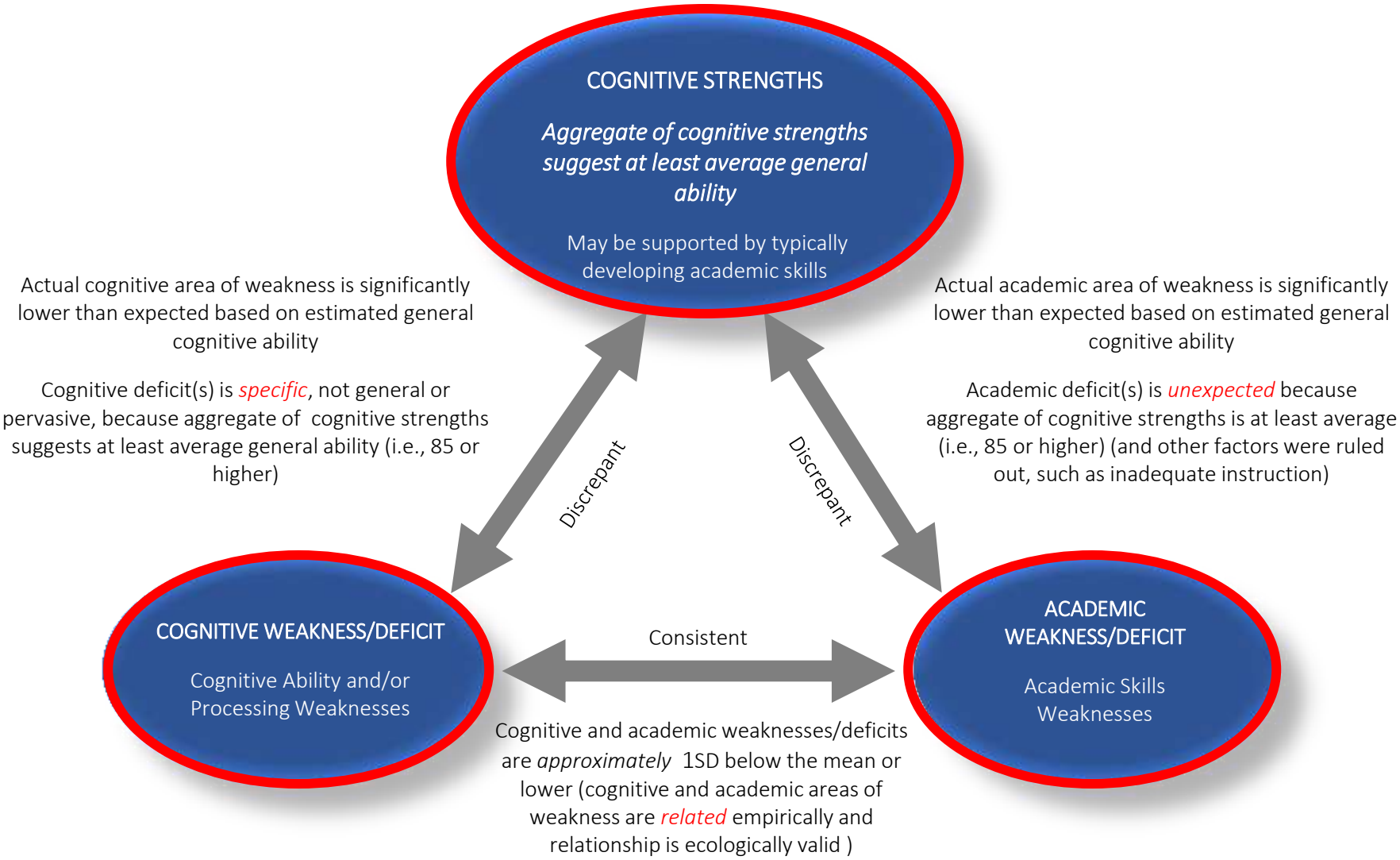
Pattern of Strengths and Weaknesses Model



Limitations of the PSW Model Recommended for Use with the WISC-V

- Not clear why NVI and GAI cannot be used as area of " cognitive strength"
- Not clear why CPI and STI cannot be used as "cognitive weakness"
- Allows for VCI as a processing weakness, but VCI is Vocabulary Knowledge
- Because two subtests (e.g., VSI) can be used to represent a cognitive processing strength, SLD may be identified in students who have more pervasive cognitive weaknesses, not specific cognitive weaknesses
- Despite having completed 20-40 subtests, only three scores, or approximately 5-6 subtests are considered in the PSW analysis – what about everything else?
- Simple-difference method is not considered the best method for examining score differences for purposes of SLD determination
- Below Average Aptitude (Processing)-Achievement Consistency Component of PSW model is not directly addressed (may lead to Type 1 error – identifying SLD in error)

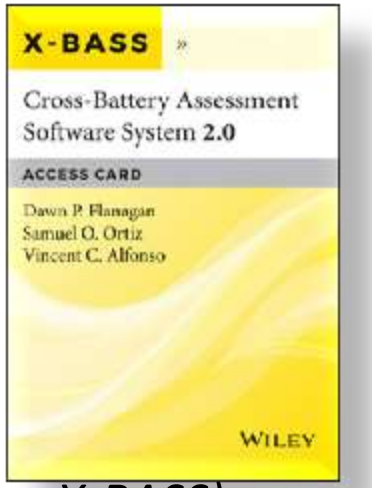
Conceptual Understanding of the Dual Discrepancy/Consistency (DD/C) Method



Flanagan, Ortiz, and Alfonso (2002 - 2019)

Essential Elements of PSW based on DD/C Operational Definition of SLD

Flanagan, Ortiz, and Alfonso (2002-2017)

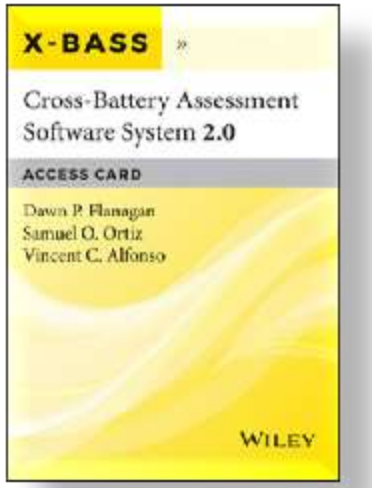


- Level I: Academic weakness (SS < 90; more typically below 85)
  - *Must also meet criteria for unexpected underachievement*
  - *Not all weaknesses are unexpected (to determine unexpected use X-BASS)*
- Level II: Exclusionary factors must be ruled out as the primary cause of the academic skill weakness(es)
  - It is not unusual to find one or more exclusionary factors that contribute to academic weaknesses
  - Use exclusionary factors form to ensure accountability
- Level III: Cognitive weakness (SS < 90; more typically below 85)
  - *Must also meet criteria for domain-specific weakness*
  - *Not all cognitive weaknesses are domain-specific (to determine domain-specific use X-BASS)*
  - Generally low average ability across most cognitive areas does not meet the criterion of a domain-specific cognitive weakness

X-BASS (Flanagan, Ortiz, & Alfonso, 2015-2019) is necessary to conduct the DD/C PSW analysis

Essential Elements of PSW based on DD/C Operational Definition of SLD

Flanagan, Ortiz, and Alfonso (2002-2017)



- Level IV: Data support a "dual discrepancy" and a "consistency" with at least average ability to think and reason

  - **Discrepancy 1**: Difference between cognitive strengths and cognitive weaknesses is significant; difference between actual and predicted (from general ability or the Facilitating Cognitive Composite [FCC]) performance is unusual (base rate of about 10%) – *supports domain-specific cognitive weakness*

  - **Discrepancy 2**: Difference between cognitive strengths and academic weaknesses is significant; difference between actual and predicted (from general ability or FCC) performance is unusual (base rate of about 10%) – *supports unexpected underachievement*

  - **Consistency:** Empirical or ecologically valid relationship between cognitive and academic weaknesses

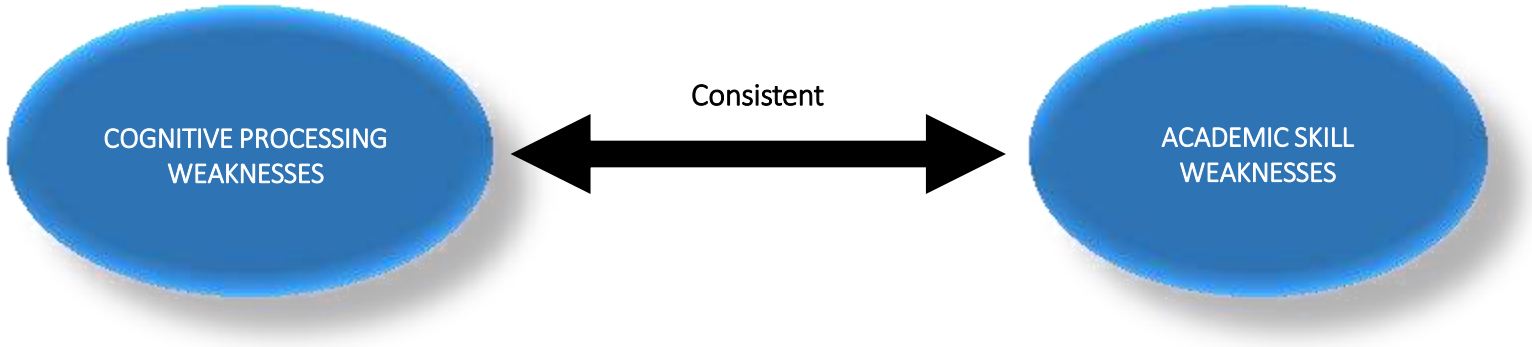
X-BASS (Flanagan, Ortiz, & Alfonso, 2015-2019) is necessary to conduct the DD/C PSW analysis

Consistency – Don’t Assume a Perfect Prediction

Not all academic weaknesses have corresponding cognitive weaknesses

Cognitive processing weaknesses do not guarantee that there will be academic weaknesses – they simply ***raise the risk*** (Flanagan & Schneider, 2016)

*Relationship is **probabilistic**, not deterministic, as some have erroneously assumed (e.g., Kranzler et al., 2016)*



Not All Definitions of SLD Assume at Least Average Overall Ability

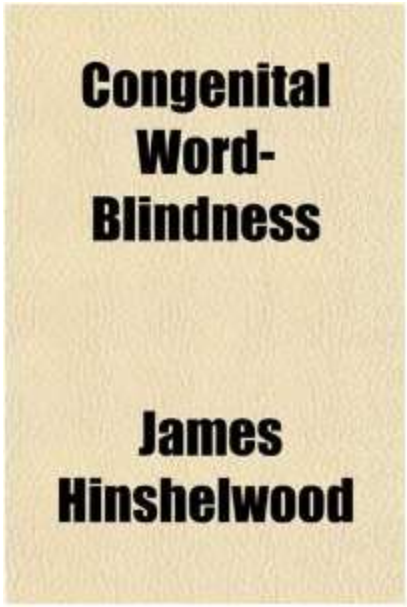
The Dual Discrepancy/Consistency (DD/C) Operational Definition of SLD Requires at Least Average Overall Ability to Think and Reason Despite Some Cognitive Processing Deficits

What set the DD/C apart from other models is that is distinguishes SLD from General Learning Difficulty (GLD)

Is At Least Average Overall Ability Consistent with the SLD Construct?

Individuals with SLD have At Least Average Overall Ability

- The children often have average or above intelligence and good memory in other respects
- Hinshelwood, 1902



"Historical Perspective" Information from Nancy Mather, NYASP 2011

Individuals with SLD have At Least Average Overall Ability

Many of the children have a high degree of intelligence

Orton, 1937

"Historical Perspective" Information from Nancy Mather, NYASP 2011

Individuals with SLD have At Least Average Overall Ability

"it seems probably that psychometric tests as ordinarily employed give an entirely erroneous and unfair estimate of the intellectual capacity of these children" (p. 582)

Orton, 1925

Gf-Gc Composite Recommended in Comparison Procedures for students suspected of SLD

"Historical Perspective" Information from Nancy Mather, NYASP 2011

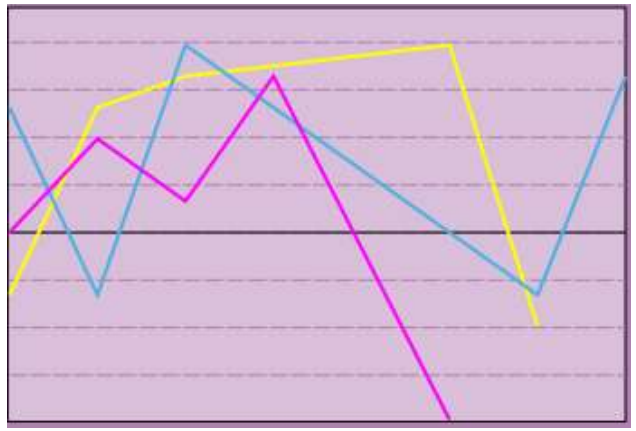
Individuals with SLD have At Least Average Overall Ability

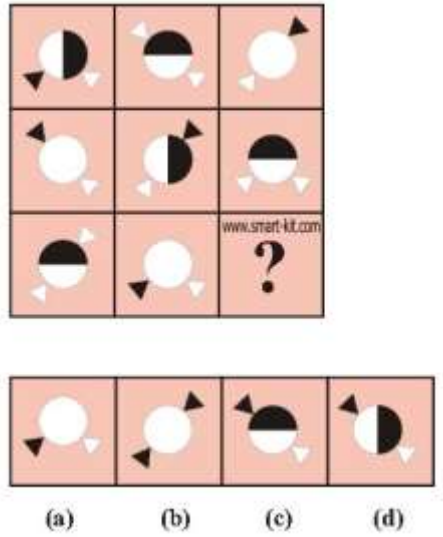
- Remedial training must continue until reading is in harmony with the child's other capacities and achievement
- Some children of superior intelligence struggle to learn to read
- Monroe, M. (1932)

"Historical Perspective" Information from Nancy Mather, NYASP 2011

Individuals with SLD have At Least Average Overall Ability

- “Sometimes children of good general intelligence show retardation in some of the specific skills which compose an intelligence test” (p. 22)
- Monroe and Backus (1937)





“Historical Perspective” Information from Nancy Mather, NYASP 2011

Individuals with SLD have At Least Average Overall Ability

- "…generalized integrity and deficiency in learning (p. 9)…there is a deficit in learning in the presence of basic integrity" (p. 25).

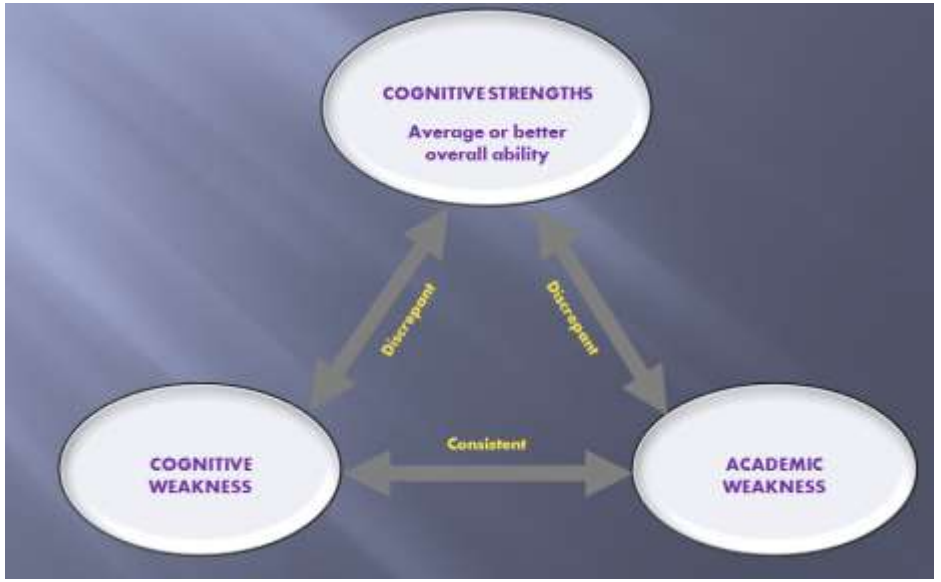
- Source: Johnson, D. J., & Myklebust, H. R. (1967). *Learning disabilities: Educational principles and practices*. New York: Grune & Stratton.

Cited in: Mather, N. (2016). *Using the WJ IV to Diagnose Specific Reading Disabilities*. Webinar – Houghton Mifflin Harcourt. bcove.me/g81r4scv

Individuals with SLD have At Least Average Overall Ability

"The clearest expression of a special disability is consistently low scores on a series of tests in a given subject conjoined with average or superior scores on tests in other subjects. Such scores can be arranged in an 'educational profile.' For example, in case of a reading disability, a child might obtain scores placing him in the ninth grade in arithmetic…and in the third grade in reading. Here we would have evidence of a striking reading disability." (p. 43).

Source: Travis, L. E. (1935). Intellectual factors. In G. M. Whipple (Ed.), *The thirty-fourth yearbook of the National Society for the Study of Education: Educational Diagnosis* (pp. 37-47). Bloomington, IL: Public School Publishing Company.



"Historical Perspective" Information from Nancy Mather, NYASP 2011

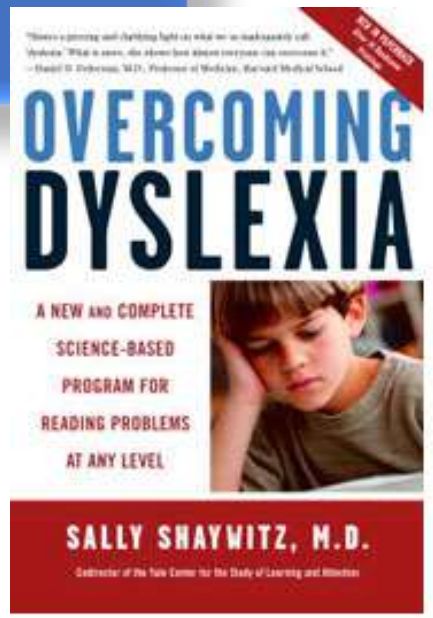
Individuals with SLD have At Least Average Overall Ability

All historical approaches to SLD *emphasize the spared or intact abilities* that stand in stark contrast to the deficient abilities

Kaufman, 2008, pp. 7-8

Individuals with SLD have At Least Average Overall Ability

"Weaknesses in word reading and spelling surrounded by a ***sea of strengths***"

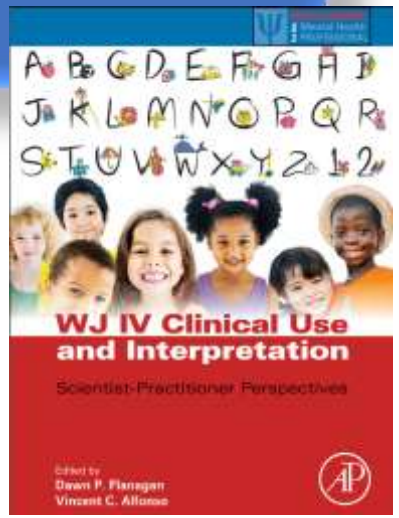


Individuals with SLD have At Least Average Overall Ability

- **Learning Disabilities Association of Canada**
- "Learning Disabilities refer to a number of disorders which may affect the acquisition, organization, retention, understanding or use of verbal or nonverbal information. ***These disorders affect learning in individuals who otherwise demonstrate at least average abilities essential for thinking and/or reasoning***"
- Source: www.ldac-acta.ca/en/learn-more/ld-defined.html

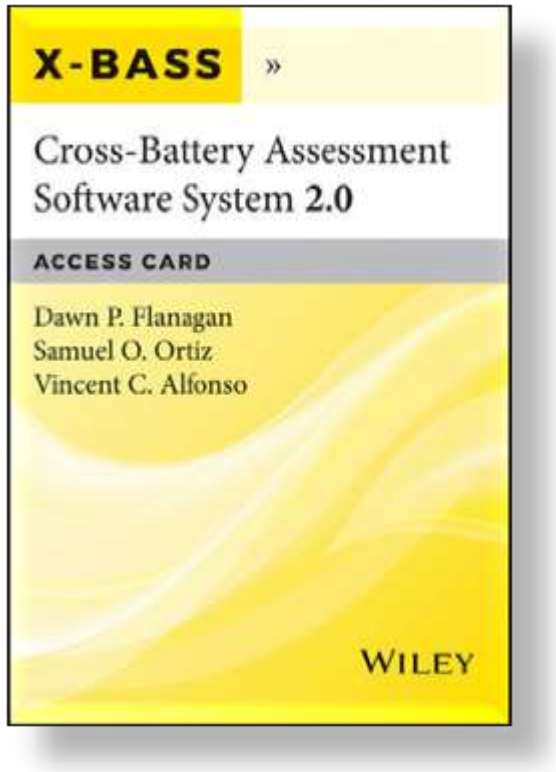
Individuals with SLD have At Least Average Overall Ability

By failing to differentially diagnose SLD from other conditions that impede learning, such as intellectual disability, pervasive developmental disorders, and overall below average ability to learn and achieve, the SLD construct loses its meaning and there is a tendency (albeit well intentioned) to accept anyone under the SLD rubric who has learning difficulties for reasons other than specific cognitive dysfunction…



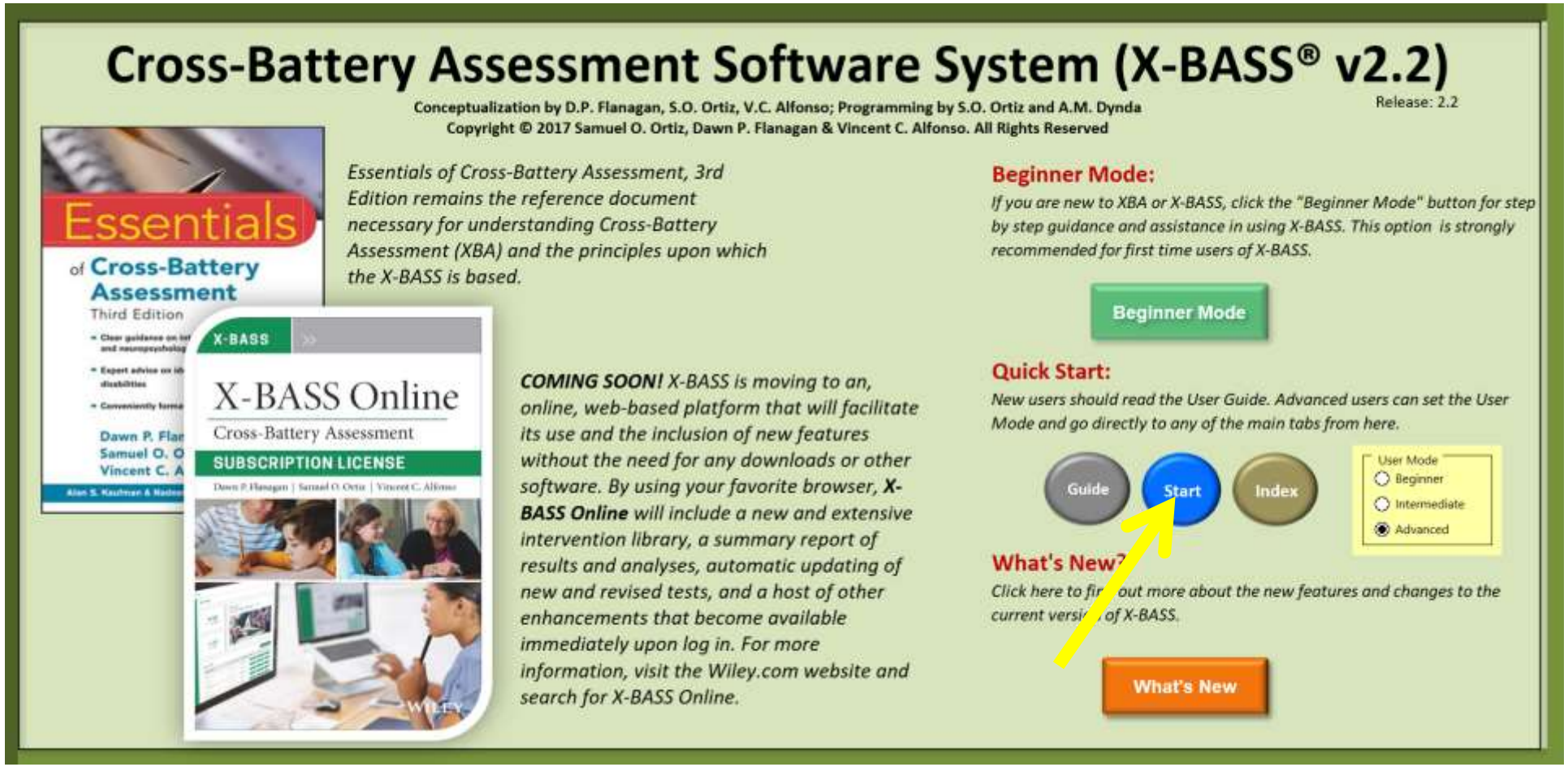
McDonough, E. M., & Flanagan, D. P. (2016). Use of the Woodcock-Johnson IV in the identification of specific learning disabilities in school-age children. In Flanagan & Alfonso (Eds.), *WJ IV Clinical Use and Interpretation: Scientist-Practitioner Perspectives*. Burlington, MA: Elsevier.

WISC-V Interpretive System and PSW are Operationalized by X-BASS



Most current version is 2.2; version 2.3 available soon

X-BASS Welcome Screen



Guide

Start/Data Record Management

Release: 2.2

Index

Tab Help

Next Step

WISC-V | WAIS-IV | WPPSI-IV | WIAT-III | WJ IV COG | WJ IV ACH | WJ IV OL | KABC-II | KTEA-3 | CAS2 | DAS-II | SB5

To **SET** or change user mode for X-BASS, use the buttons to the right. Beginner Mode displays additional guidance and assistance in using the program. Intermediate mode displays typical informational and confirmational messages. Advanced mode suppresses all except critical messages.

User Mode: ○ Beginner ○ Intermediate ◉ Advanced

1. ENTER NAME (if new case)

2. ENTER DATES/GRADE

3. CREATE NEW DATA RECORD

*Name of Examinee:	Rebecca	*Date of Evaluation:	10/10/2018	Use mm/dd/yyyy If an error occurs, try yyyy/mm/dd.
Name of Evaluator:		*Date of Birth:	10/10/2009	
Examinee's Age:	9 years 0 month(s)	*Examinee's Grade:	4	PK,K,1-12,12+

Create New Record

Check box if examinee is an English learner (EL) ☐

DATA RECORD IS ACTIVE

To **OPEN** and activate a saved record from the database, select it from the dropdown menu on the right. Data records are listed in alphabetical order by first name. Once selected, all data associated with the record will be populated in the appropriate locations. Click the Index button at the upper right corner of this tab to begin reviewing and updating the saved data. The program can store and retrieve data for up to 500 cases.

OPEN SAVED DATA RECORD

To **SAVE** or update the current data record, click the blue "Save Current Record" button and continue working. Frequent saves are recommended.

Save Current Record

To **RUN** a PSW Quick Analysis click the yellow button and enter the scores and grade level. There is no need to create a case record to conduct PSW-QA.

PSW Quick Analysis

To **EXPORT** and save the current database (for importation to a newer version of X-BASS), click the "Export Current Database" button. This action creates a file that can be used by updated versions of X-BASS to automatically transfer and merge the current database for use with the new version.

Export Current Database

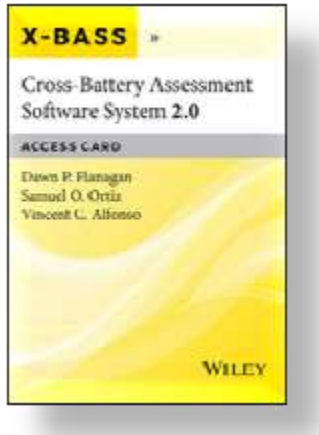
To **IMPORT** a saved database (for use in a newer version of X-BASS), click the "Import Saved Database" button. Note that you must have already exported the previous database using the older version of X-BASS. Once the older database has been properly saved, use this button to import it.

Import Saved Database

To **CLEAR** all scores, selections, and tab data in current use from the program, click the "Clear Data/Reset Program" button. CAUTION: This action is not

PSW Component of X-BASS

- Transfer best estimates of cognitive abilities and processes and academic scores to XBA Organizer Tab
- From XBA Organizer tab, select estimates to be used in PSW analysis
- Designate these estimates as either strengths or weaknesses for the individual (relative or normative)
- View results of PSW analysis
- Select different cognitive and academic weaknesses for analysis if necessary
- Print interpretation of results



What Does DD/C Allow You to Conclude When Criteria are Met

Failure To Respond to quality instruction and intervention

At least Average Ability to Think/reason; Low Achiev Unexpected

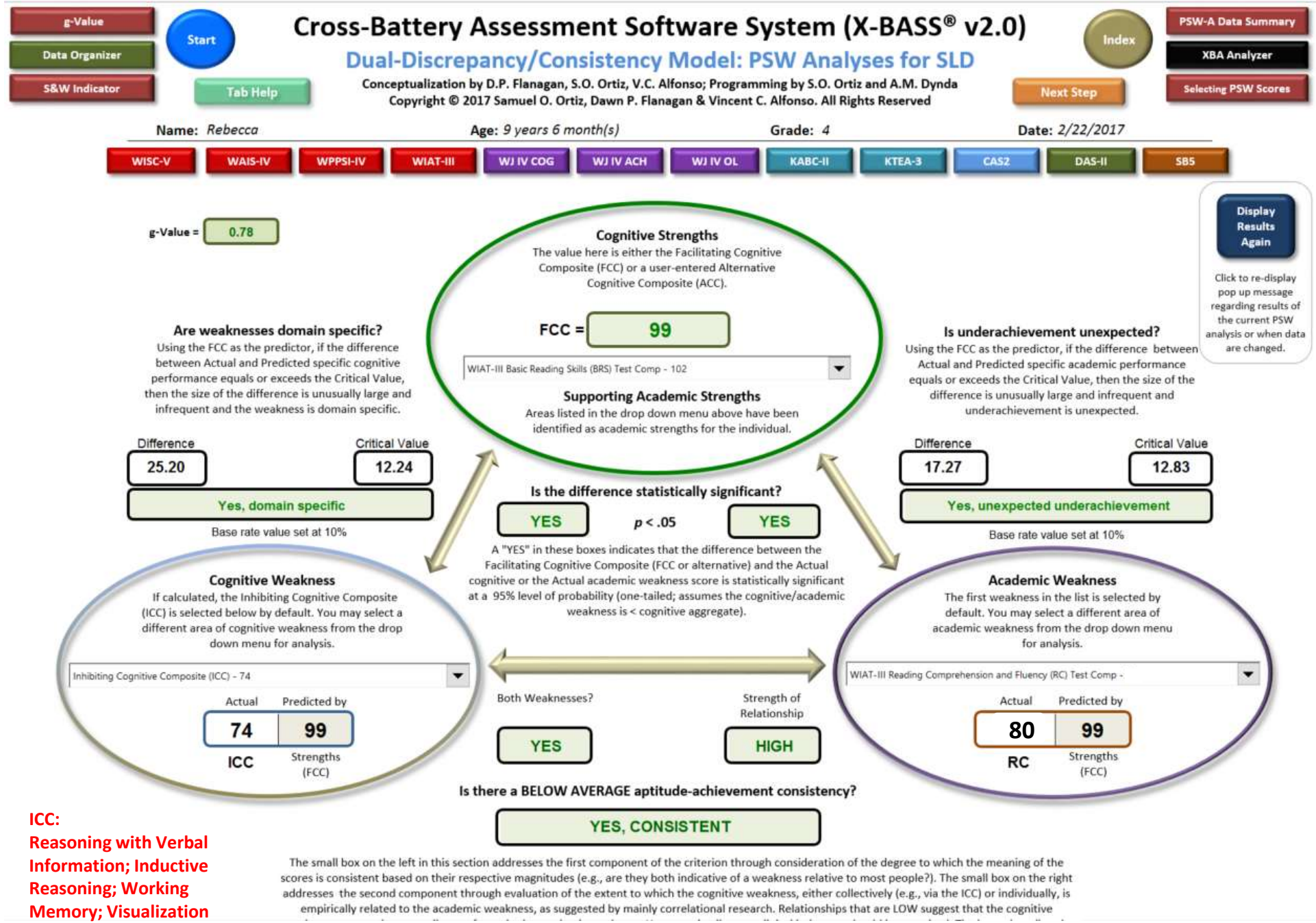
Exclusionary Factors ruled out as primary reason for underachievement

Domain-specific weaknesses/deficits in cognitive areas that are related empirically to achievement weaknesses

Meets DD/C criteria; "pattern of strengths and weaknesses"

associative memory. Thus, while Bob has the ability to think and reason like most children his age, as demonstrated by his performance in the cognitive areas of Fluid Reasoning, Comprehension-Knowledge, and Visual-Spatial Thinking, he possesses specific and related cognitive and academic deficits that are consistent with a diagnosis of Specific Learning Disability (SLD).

Flanagan, D. P., & Alfonso, V. C. (2011). RTI Data and Cognitive Assessment are Both Useful for SLD Identification and Intervention Planning. In N. Mather & L. E. Jaffe (Eds.), *Expert Psychological Report Writing*. New York, NY: John Wiley & Sons.



ICC:
Reasoning with Verbal Information; Inductive Reasoning; Working Memory; Visualization

Identification of SLD

- **Involves more than just examining scores from standardized tests**
  - A convergence of data sources is necessary
  - Data should be gathered via different methods
  - Exclusionary factors must be considered and examined systematically

- **Exclusionary Factors Form**

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Evaluation and Consideration of Exclusionary Factors for SLD Identification

An evaluation of specific learning disability (SLD) requires an evaluation and consideration of factors, other than a disorder in one or more basic psychological processes that may be the primary cause of a student's academic skill weaknesses and learning difficulties. These factors include (but are not limited to), vision/hearing[1], or motor disabilities, intellectual disability (ID), social/emotional or psychological disturbance, environmental or economic disadvantage, cultural and linguistic factors (e.g., limited English proficiency), insufficient instruction or opportunity to learn and physical/health factors. These factors may be evaluated via behavior rating scales, parent and teacher interviews, classroom observations, attendance records, social/developmental history, family history, vision/hearing exams[1], medical records, prior evaluations, and interviews with current or past counselors, psychiatrists, and paraprofessionals who have worked with the student. Noteworthy is the fact that students with (and without) SLD often have one or more factors (listed below) that ***contribute*** to academic and learning difficulties. However, the practitioner must rule out any of these factors as being the ***primary*** cause of a student's academic and learning difficulties to maintain SLD as a viable classification/diagnosis.

Form published in Flanagan, Alfonso, Mascolo, & Sotelo-Dynega (2012). Use of Intelligence Tests in the Identification of Specific Learning Disabilities Within the Context of An Operational Definition. *In Flanagan & Harrison (Eds.) , Contemporary Intellectual Assessment: Theories, Tests, and Issues (3rd edition). New York: Guilford.*

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Vision (Check All that Apply):

☐ Vision test recent (within 1 year)

☐ Vision test outdated (> 1 year)

☐ Passed

☐ Failed

☐ Wears Glasses

☐ History of visual disorder/disturbance

☐ Diagnosed visual disorder/disturbance

Name of disorder: _____

☐ Vision difficulties suspected or observed

(e.g., difficulty with far or near point copying, misaligned numbers in written math work, squinting or rubbing eyes during visual tasks such as reading, computers)

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Hearing (Check All that Apply)[2]:

☐ Hearing test recent (within 1 year)	☐ History of auditory disorder/disturbance
☐ Hearing test outdated (> 1 year)	☐ Diagnosed auditory disorder/disturbance
☐ Passed	☐ Name of disorder:_____
☐ Failed	☐ Hearing difficulties suggested in the referral
☐ Uses Hearing Aids	(e.g., frequent requests for repetition of auditory information, misarticulated words, attempts to self-accommodate by moving closer to sound source, obvious attempts to speech read)

NOTES:_____

_____

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Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Motor Functioning (Check All that Apply):

☐ Fine Motor Delay/Difficulty

☐ Gross Motor Delay/Difficulty

☐ Improper pencil grip (Specify type: _____)

☐ Assistive devices/aids used
(e.g., weighted pens, pencil grip, slant board)

☐ History of motor disorder

☐ Diagnosed motor disorder

Name of disorder: _____

☐ Motor difficulties suggested in the referral
(e.g., illegible writing; issues with letter or number formation, size, spacing; difficulty with fine motor tasks such as using scissors, folding paper)

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Cognitive and Adaptive Functioning (Check All that Apply):

☐ Significantly "subaverage intellectual functioning" (e.g., IQ score of 75 or below)

☐ Pervasive cognitive deficits (e.g., weaknesses or deficits in many cognitive areas, including *Gf* ***and*** *Gc*)

☐ Deficits in adaptive functioning (e.g., social, communication, self-care)

Areas of significant adaptive skill weaknesses (check all that apply):

☐ Motor Skill	☐ Communication	☐ Socialization
☐ Daily Living Skills	☐ Behavior/Emotional Skills	☐ Other

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Social-Emotional/Psychological Factors (Check All that Apply):

☐ Diagnosed psychological disorder (Specify: _____)

☐ Date of Diagnosis

☐ Family history significant for psychological difficulties

☐ Disorder presently treated - specify treatment modality (e.g., counseling, medication): _____

☐ Reported difficulties with social/emotional functioning (e.g., social phobia, anxiety, depression)

☐ Social-Emotional/Psychological issues suspected or suggested by referral

☐ Home-School Adjustment Difficulties

☐ Lack of Motivation

☐ Emotional Stress

☐ Autism

☐ Present Medications (type, dosage, frequency, duration) _____

☐ Prior Medication Use (type, dosage, frequency, duration) _____

☐ Hospitalization for psychological difficulties (date(s): _____)

☐ Deficits in social, emotional, or behavioral [SEB] functioning (e.g., as assessed by standardized rating scales)

Significant scores from SEB measures: _____

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Environmental/Economic Factors (Check All that Apply):

- ☐ Limited access to educational materials in the home
- ☐ Caregivers unable to provide instructional support
- ☐ Economic considerations precluded treatment of identified issues (e.g., filling a prescription, replacing broken glasses, tutoring)
- ☐ Temporary Crisis Situation
- ☐ History of educational neglect
- ☐ Frequent transitions (e.g., shared custody)
- ☐ Environmental space issues (e.g., no space for studying, sleep disruptions due to shared sleeping space)

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Cultural/Linguistic Factors (Check All that Apply)[3]:

☐ Limited Number of Years in U.S. (____)

☐ Language(s) Other than English Spoken in Home

☐ No History of Early or Developmental Problems in Primary Language

☐ Lack of or Limited Instruction in Primary Language (# of years _____)

☐ Current Primary Language Proficiency: (Dates: _____ Scores: _____)

☐ Current English Language Proficiency: (Date: _____ Scores: _____)

☐ Acculturative Knowledge Development (Circle one: High – Moderate – Low)

☐ Parental Educational and Socio-Economic Level (Circle one: High – Moderate – Low)

NOTES:_____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Physical/Health Factors (Check All that Apply):

☐Limited access to healthcare ☐Minimal documentation of health history/status

☐Chronic health condition (Specify: _____) ☐Migraines

☐Temporary health condition (Date/Duration: _____) ☐Hospitalization (Dates: _____)

☐History of Medical Condition (Date Diagnosed _____)

☐Medical Treatments (Specify: _____)

☐Repeated visits to the school nurse ☐Repeated visits to doctor

☐Medication (type, dosage, frequency, duration: _____)

NOTES: _____

_____

_____

Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Flanagan et al.'s DD/C Definition of SLD: Level II – Review of Exclusionary Factors

Instructional Factors (Check All that Apply):

☐ Interrupted schooling (e.g., mid-year school move) Specify why: _____

☐ New teacher (past 6 months) ☐ Retained or advanced a grade(s)

☐ Nontraditional curriculum (e.g., homeschooled) ☐ Accelerated curriculum (e.g., AP classes)

☐ Days Absent _____

NOTES: _____

_____

_____

Determination of Primary and Contributory Causes of Academic Weaknesses and Learning Difficulties (Check One):

☐Based on the available data, it is reasonable to conclude that one or more factors is *primarily* responsible for the student's observed learning difficulties. Specify: _____

☐Based on the available data, it is reasonable to conclude that one or more factors *contributes* to the student's observed learning difficulties. Specify: _____

☐*No* factors listed here appear to be the primary cause of the student's academic weaknesses and learning difficulties

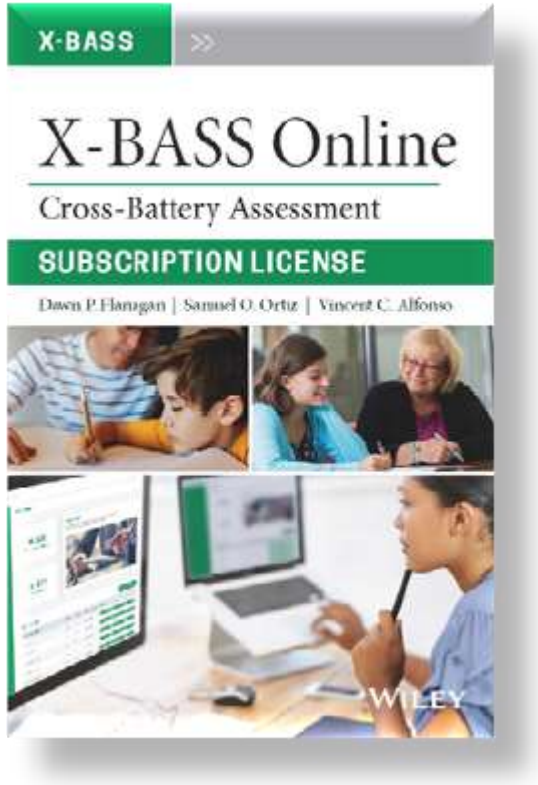
Form downloadable on CD that accompanies *Essentials of Cross-Battery Assessment*, 3e (Flanagan, Oritz, & Alfonso, 2013)

Select Interventions

- Use Intervention Library In X-BASS Online

Intervention Library Features

- 11 cognitive domains: Gf, Gc, Gl, Gr, Gv, Ga, Gv, Gs, Orthographic Processing, Executive Functions – Planning and Attention; Executive Functions – Time Management
- 8 academic domains: BR, RF, RC, MC, MPS, WE, LC, OE
- 5 intervention areas: Instructional, Environmental, Curricular, Remediation Techniques/Programs, Strategies/Compensation
- 4 Important Grade Groups: Early Elementary, Late Elementary, Middle School, High School+
- 3 Instructional Delivery Settings: Individual, Small Group, Whole Class
- 2 Cost options: Free, Not Free
- Appropriate for English Learners



Five Intervention Areas

Instructional

Teaching procedures and techniques used to support learning and assist in minimizing the impact of cognitive or academic weaknesses

Environmental

Physical resources in a student's learning setting that may be used or adapted to increase access to, or support understanding of, instructional content

Curricular

Printed, digital, and other educational resources that may be used to support and reinforce initial learning in a manner that responds to a student's unique needs

Remediation Techniques/Programs

Remediation techniques and programs intended to ameliorate academic weaknesses and train specific cognitive processing weaknesses or circumvent their impact on acquiring and developing academic skills

Strategies/Compensation

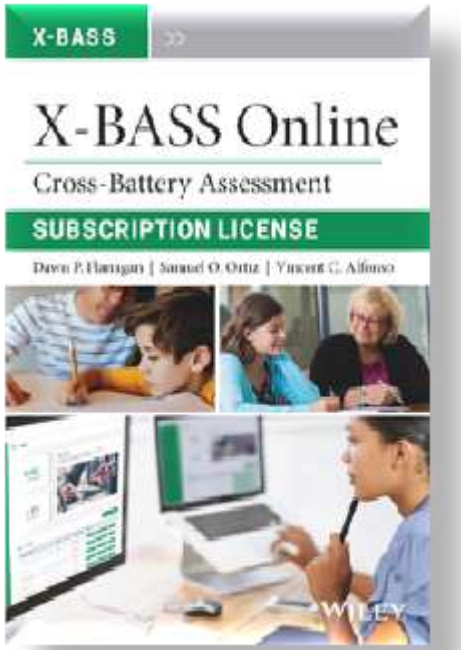
Strategies, procedures, and techniques used by the student to support learning and to assist in compensating for or minimizing the impact of cognitive or academic weaknesses

Instructional

Teaching procedures and techniques used to support learning and assist in minimizing the impact of cognitive or academic weaknesses

For student's weakness in GI (learning efficiency)

Use multiple modalities when teaching new concepts to support dual (verbal/nonverbal) encoding	Integrate where possible some combination of visual, auditory, tactile, and kinesthetic modalities during instruction to support dual encoding (in which verbal and nonverbal information is represented in separate but related systems). For a description of **multisensory learning**, visit: https://tinyurl.com/about-multisensory
Use multiple modalities when teaching new concepts to support dual (verbal/nonverbal) encoding	Integrate where possible some combination of visual, auditory, tactile, and kinesthetic modalities during instruction to support dual encoding (in which verbal and nonverbal information is represented in separate but related systems). For a description of **multisensory learning**, visit: https://tinyurl.com/about-multisensory For assistance in using **multisensory activities** to help children, visit: https://tinyurl.com/parents-help-child-learn
Use consistent instructional routines to help students organize information to optimize encoding	Instructional routines are predictable, clear formats for teaching specific skills, processes, or procedures. They are best presented using clear, concise, and replicable language for the teacher and the student. When the student knows and understands what is expected, instructional time is reduced and more time is focused on content, thereby optimizing encoding and learning efficiency. For examples of **instructional routines**, visit: https://tinyurl.com/instructional-routines
Provide task directions in a manner that supports encoding	When giving directions pair visual information with verbal information to support dual (visual/verbal) encoding. This could involve using gestures, drawing on the board, or physically modeling the steps of the process being taught. For suggestions on **how to give a student directions** that he or she is likely to hold on to, visit: https://tinyurl.com/how-to-give-directions



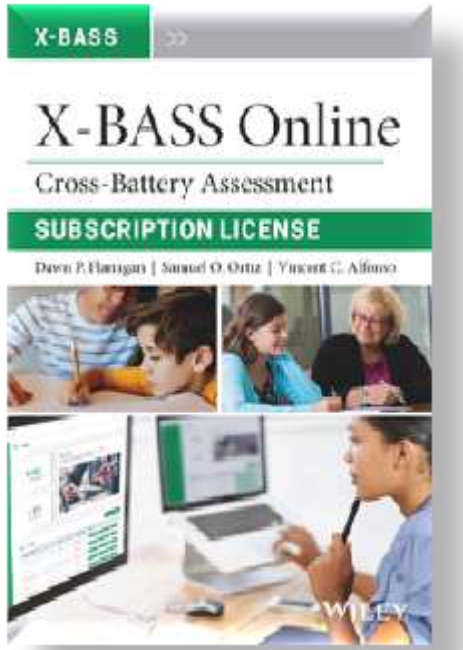
Select interventions that best meet student's needs; customize and print intervention report

Environmental

Physical resources in a student's learning setting that may be used or adapted to increase access to, or support understanding of, instructional content

For student's weakness in GI (learning efficiency)

Provide the student with a quiet environment or area to help reduce interference during learning	A quiet environment can facilitate initial encoding of information by minimizing distractions. Quiet environments may be achieved by working in small groups, a separate location, or using noise reduction aids (e.g., headphones, cubicles, study carrels). It may also be helpful to seat the student preferentially (e.g., near the front of the room), close to the teacher, and away from windows, the door, and distracting peers. For tips on how to **reduce distractions in the classroom**, visit: https://tinyurl.com/reduce-distractions
Display posters and charts to help the student make connections	Posters and charts that make connections, show relationships, and demonstrate concepts or procedures provide different ways of encoding information (e.g., anchor and procedural charts). Having these charts displayed in the classroom provides continuous exposure to information thereby aiding in consolidation of the information into long-term stores. To help the student **transfer ideas and "anchor" them** into long-term memory, visit: https://tinyurl.com/students-create-charts
Display posters and charts to help the student make connections	Posters and charts that make connections, show relationships, and demonstrate concepts or procedures provide different ways of encoding information (e.g., anchor and procedural charts). Having these charts displayed in the classroom provides continuous exposure to information thereby aiding in consolidation of the information into long-term stores. For a wealth of information on **how to make and use anchor charts** in the classroom by grade and academic area, visit: https://tinyurl.com/how-to-anchor-charts
Provide access to a computer to visit teacher-recommended websites that facilitate and support learning efficiency	Website(s) and software program(s) that are commonly used in schools or available in school districts include: For example, **Kidspiration** ® uses a visual thinking methodology that helps students develop thinking skills, improve reading and writing skills, and build conceptual understanding. Also, Study Island ® is a website that helps students study and learn via practice items built from state standards, interactive lessons and activities, progress monitoring, remediation, and benchmarks. For more **information about Kidspiration** software, visit: http://www.inspiration.com/Kidspiration For more **information about Study Island** software, visit: http://www.studyisland.com/



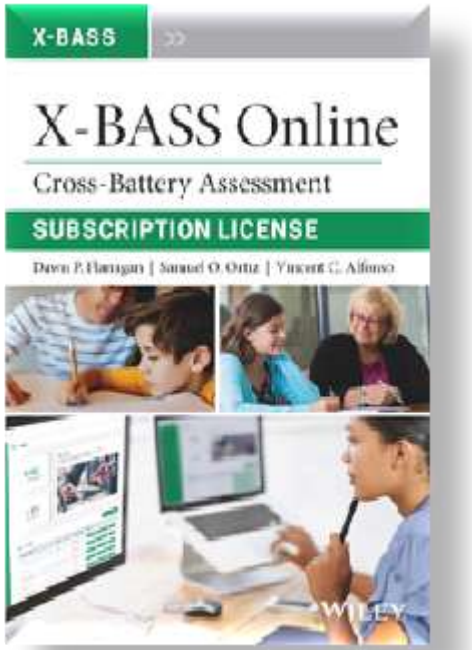
Select interventions that best meet student's needs; customize and print intervention report

Curricular

Printed, digital, and other educational resources that may be used to support and reinforce initial learning in a manner that responds to a student's unique needs

For student's weakness in GI (learning efficiency)

Direct student to web-based study programs to support encoding through a vairety of studying strategies	Programs that support studying may allow for multiple practice opportunities, immediate feedback, automatic variation of content, and data collection about strategy use. For an example of **web-based programs that reinforce learning**, see: https://www.khanacademy.org (click on "Courses" to the left of the Search bar to get started) *and* https://www.quizlet.com
Direct student to memory checklists to support learning	Memory checklists can help with learning skills and procedures. They consist of written steps and boxes for checking off each step. Memory checklists can be used for academic tasks with step-by-step procedures, as well as other daily tasks. To **customize checklists for students**, visit: https://tinyurl.com/check-list-strategies
Provide practice tests that are similar in format to the acutal test to support encoding and retrieval	Practice tests that are in a similar format to the actual test aids with encoding of newly learned information. Also, when cues provided on practice tests are similar to those provided on the actual test, recall is enhanced. For example, if the test will be multiple choice, provide multiple choice practice tests with similar stems as will be seen on the actual test. To **create practice tests** for a student, visit: https://www.typeform.com/tests/
Direct student to resources prior to lessons to reduce memory demands	Partially-completed graphic organizers, diagrams, guided notes, and teacher-prepared handouts reduce the demands on the student's memory and provide a greater number of cues to facilitate encoding and later recall. For a **guided notes maker**, visit: https://tinyurl.com/guiding-notes *or* https://tinyurl.com/powerpoint-notes-maker To **create your own graphic organizers**, visit: https://tinyurl.com/graphic-notes For a **free-form graphic organizer** (i.e., webbing tool) that encourages hypertextual thinking and writing, go to: https://tinyurl.com/graphic-organizer-webbing-tool



Select interventions that best meet student's needs; customize and print intervention report

Remediation Techniques/Programs

Remediation techniques and programs intended to ameliorate academic weaknesses and train specific cognitive processing weaknesses or circumvent their impact on acquiring and developing academic skills

For student's weakness in Gl (learning efficiency)

Consider the use of interactive memory games to build memory skills	Memory games that use cards, such as Concentration, board games, and other interactive games, such as Simon, help a student build memory skills. Many memory games are also available electronically. For **online memory game**s, visit: https://tinyurl.com/memory-practice
Use the RIP (Repetition, Imagery, Pattern) Toolbox when learning new information	The RIP Toolbox includes three ways to aid memory: Repetition, Imagery, and Patterns. Repetition involves repeating the information several times. To enhance the value of repetition, use strategies with humor, movement, songs, and other forms of novelty. Imagery includes using visual pictures as well as motor images (for example, to remember a phone number one may move his or her fingers in the pattern of the phone number as if dialing it) to assist in remebering information. Repetition and Imagery strategies help to create patterns. As new information comes in, prior knowledge and a means to organizing the informaton is necessary to give it meaning. This is called pattern recognition, which assists in enhancing memory. For a more comprehensive explanation of the **RIP Toolbox** along with examples of how to teach memory strategies, visit: https://tinyurl.com/RIP-Toolbox

Select interventions that best meet student's needs; customize and print intervention report

Strategies/Compensation

Strategies, procedures, and techniques used by the student to support learning and to assist in compensating for or minimizing the impact of cognitive or academic weaknesses

For student's weakness in GI (learning efficiency)

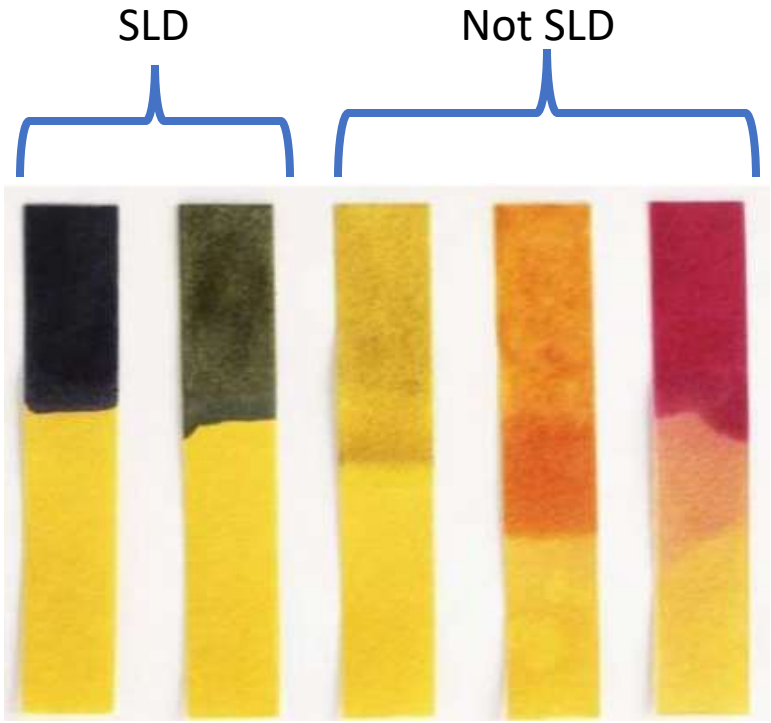
Use mnemonic strategies	A mnemonic is a memory device or learning technique that helps one remember information and retrieve it efficiently at a later time. Mnemonics are often used to assist in learning a large amount of information, long lists of things, and facts. Basic mnemonic strategies assist with connecting new learning to prior knowledge through the use of visual and auditory cues and incorporate key words, rhyming words, and acronyms. For over **400 free mnemonic devices** by subject area, visit: https://www.mnemonic-device.com/
Use the method of loci	The method of loci involves associating items to be remembered with a sequence of familiar objects and locations, such as the path to school or work or the rooms in your house. For information on **how to use the method of loci**, visit: https://tinyurl.com/learnlocimethod
Use elaboration techniques, such as note-making, re-writing, and self-questioning	Elaboration strategies incorporate multiple associations to facilitate learning and retrieval; they provide alternate pathways to retrieve information from memory. For a description of **elaboration strategies**, visit: https://tinyurl.com/elaborationstrategies For **note-taking strategies**, visit: https://tinyurl.com/strategies-note-taking For a **self-questioning teaching strategy guide**, visit: https://tinyurl.com/self-questioning-guide
Use spaced practice when studying	Spaced practice is a learning strategy that makes use of smaller increments of study and practice over a longer period of time. Spaced practice, as opposed to "massed practice" (e.g., cramming) allows students to encode information and retain it for longer periods of time. For more information on how to **study using spaced practice**, visit: https://tinyurl.com/spacedpractice

Select interventions that best meet student's needs; customize and print intervention report

Conclusions

Bottom Line

- ***There is no SLD litmus test***; the more well-versed you are in different approaches and methods, the more information you will gain about the student (including how to best help him or her)



Identification of SLD

- **Involves more than just examining scores from standardized tests or progress monitoring data**
  - A convergence of data sources is necessary
  - Data should be gathered via different methods
  - Exclusionary factors must be considered and examined systematically