# New Developments in CHC Theory, Cross-Battery *Assessment for Intervention*, and Identification of SLD

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## Today's Agenda

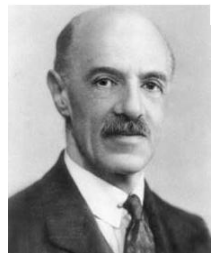
- Overview of the Field of Ability Assessment
  - Progress in Theories of Intelligence
  - Progress in Test Development
  - Progress in Test Interpretation
- What's New to Cross-Battery Assessment
- Relations between CHC Abilities and Academic Skills
- Brief Overview of Cross-Battery Assessment (XBA)
  - Data Management and Interpretive Assistant v2.0
- Application of CHC in the Schools
  - When evidenced-based interventions don't work
  - Assessment for intervention

# Agenda Continued

- Importance of Individual Differences and Differential Diagnosis
- Third Method Approaches to SLD Identification
  - Dual Discrepancy/Consistency Operational Definition of SLD (third method, pattern of strengths and weaknesses)
  - XBA PSW-A v1.0 software
- Linking Assessment Results to Intervention

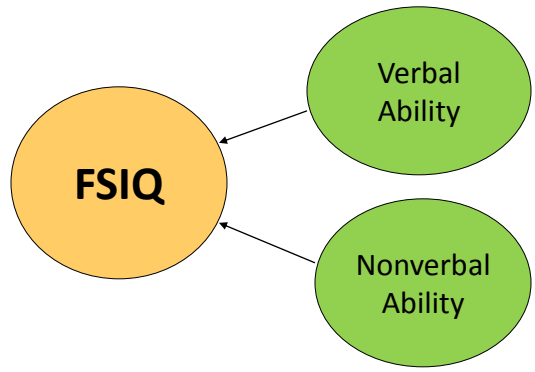
## Continuum of Progress in Psychometric Theories of Intelligence

| Theories | General Ability (*g*) | Two-Factor Models | "Limited" Multiple Factor Models | "Expanded" Multiple Factor Models |
|---|---|---|---|---|
| | Spearman | Original *Gf-Gc* Simultaneous-Successive | Thurstone's Primary Mental Abilities Planning, Attention, Simultaneous, and Successive (PASS) | Cattell-Horn *Gf-Gc* Theory Carroll Three-Stratum Theory Cattell-Horn-Carroll (CHC) |



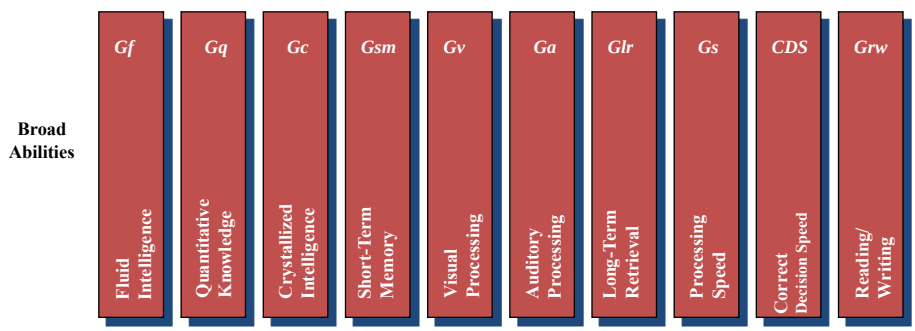
**g**

# Traditional Cognitive Assessment



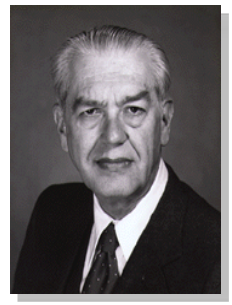

**1930s to the late 1990s**

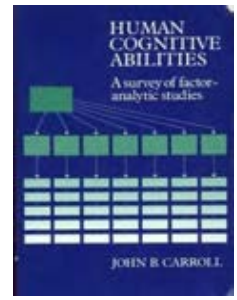
# Cattell-Horn *Gf-Gc* Theory



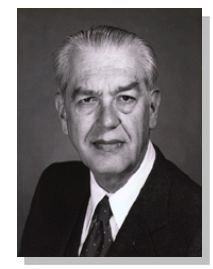
## *A Landmark Event in Understanding the Structure of Intelligence*

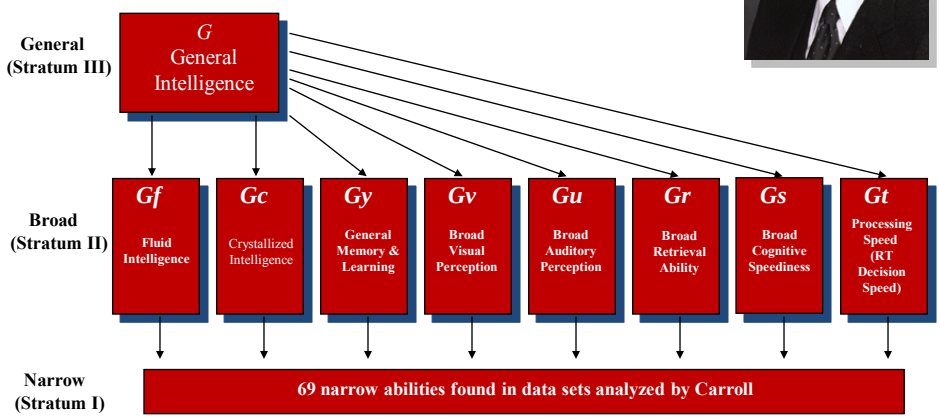
Carroll, J. B. (1993). ***Human cognitive abilities: A survey of factor-analytic studies***. New York: Cambridge University Press





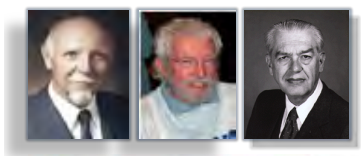

## Carroll's (1993) Three-Stratum Theory of Cognitive Abilities



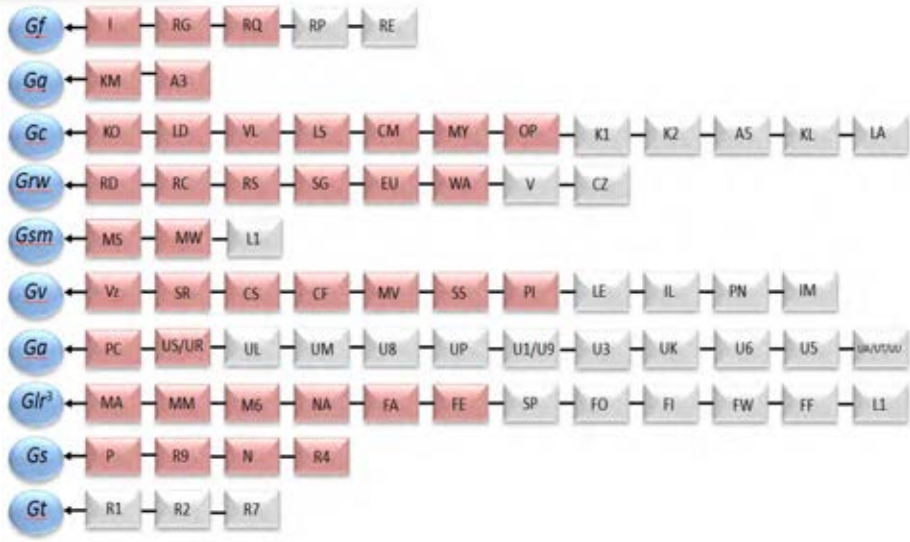


# An Integration of the *Gf-Gc* and Three-Stratum Theories of Cognitive Abilities

*Based largely on McGrew's analyses in 1997-1999*



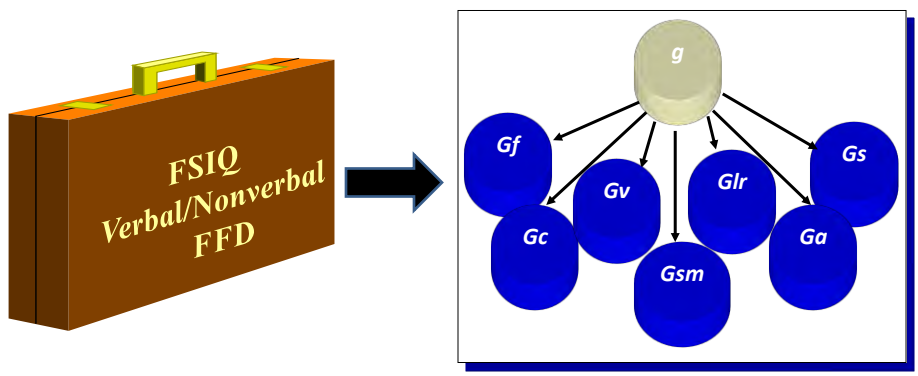
**The Cattell-Horn-Carroll (CHC) Model of Cognitive Abilities that Guided Intelligence Test Construction from 2000-2011**



## We Have Knowledge of What Our Tests Measure According to CHC Theory

- Cross-Battery Assessment Approach
  - Classification system
  - Joint or CB-CFA
  - Expert Consensus
  - Helped to establish a nomenclature for the field

Cross-Battery Approach Assisted in Paving the Way for CHC-based Test Development and Interpretation



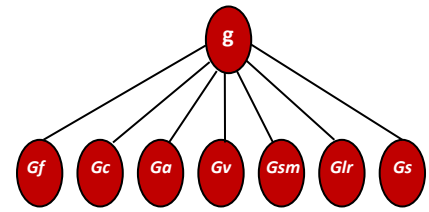
# The WJ III

(Woodcock, McGrew, & Mather, 2001)

The first in a flurry of test revisions that represented advances unprecedented in assessment fields

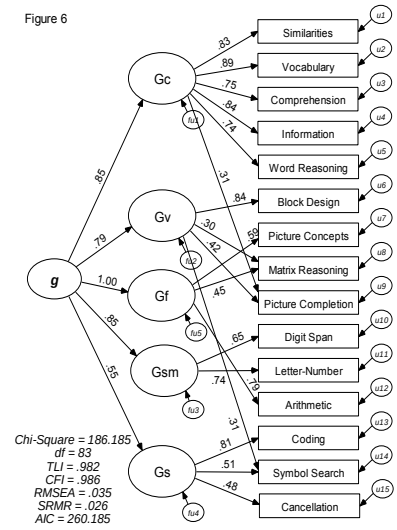
## *Contemporary Cognitive Assessment*

- SB5 (2003) – Based on CHC theory
- KABC-II (2004) – Based on CHC theory and Luria
- DAS-II (2007) – Based on CHC theory



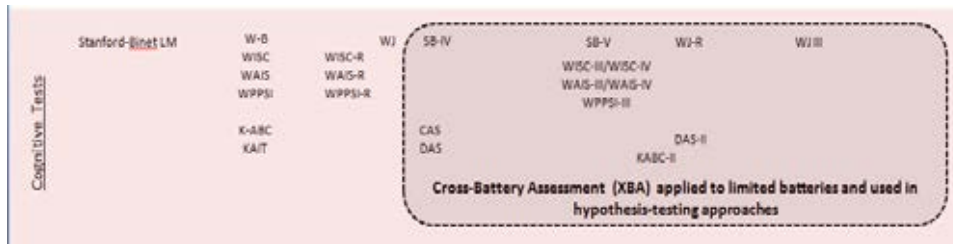

# *Contemporary Cognitive Assessment*

- **WISC-IV** (2003) – CHC terminology (e.g., Fluid Reasoning, Working Memory) and CHC approach to interpretation (Flanagan & Kaufman, 2004, 2009)
- **WAIS-IV** (2008) – CHC terminology and interpretive approach (Kaufman & Lichtenberger, 2009)




Keith et al. (2006)

# Continuum of Progress in Tests of Intelligence and Cognitive Abilities




***g*** ***VIQ-PIQ-FSIQ*** ***CHC***


WJ III

xba

# Continuum of Progress in Methods of Interpretation

| Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | Application of Theory to Interpretation (Fourth Wave) | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave) |
|---|---|---|---|

**TABLE 2.4. Wechsler's Case Example for "Adolescent Psychopaths"**

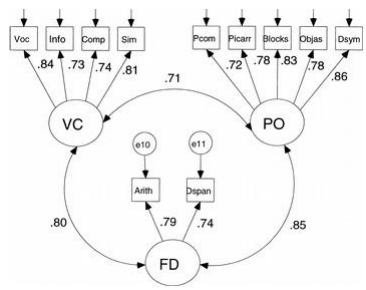
| Subtest | Standard score |
|---|---|
| Comprehension | 11 |
| Arithmetic | 6 |
| Information | 10 |
| Digits | 6 |
| Similarities | 5 |
| Picture Arrangement | 12 |
| Picture Completion | 10 |
| Block Design | 15 |
| Object Assembly | 16 |
| Digit Symbol | 12 |
| Verbal IQ (VIQ) | 90 |
| Performance IQ (PIQ) | 123 |

Table from Kamphaus et al. (2012). A History of Intelligence Test Interpretation. In D.P. Flanagan and P.L. Harrison (Eds.), Contemporary Intellectual Assessment: Theories, Tests and Issues, 3rd edition. New York: Guilford.

# Continuum of Progress in Methods of Interpretation

| Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | Application of Theory to Interpretation (Fourth Wave) | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave) |
|---|---|---|---|

***Factor Analysis*** – Cohen's Three-factor solution of the WISC




***Kaufman's Psychometric Approach***

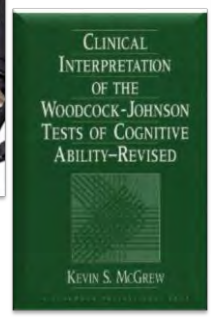
# Continuum of Progress in Methods of Interpretation

Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | **Application of Theory to Interpretation (Fourth Wave)** | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave)

**KABC**

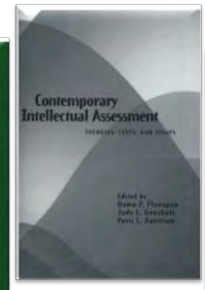
**1983**

**WJ-R**



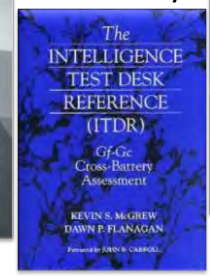

**1989-1994**

**Brought Gf-Gc and Three-stratum Theories to School Psychology**



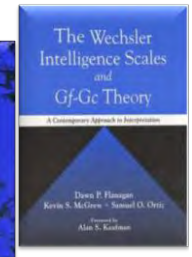

**1997**

**Cross-Battery**




**1998**

**Gf-Gc/CHC applied to Wechsler Scales**




**2000**

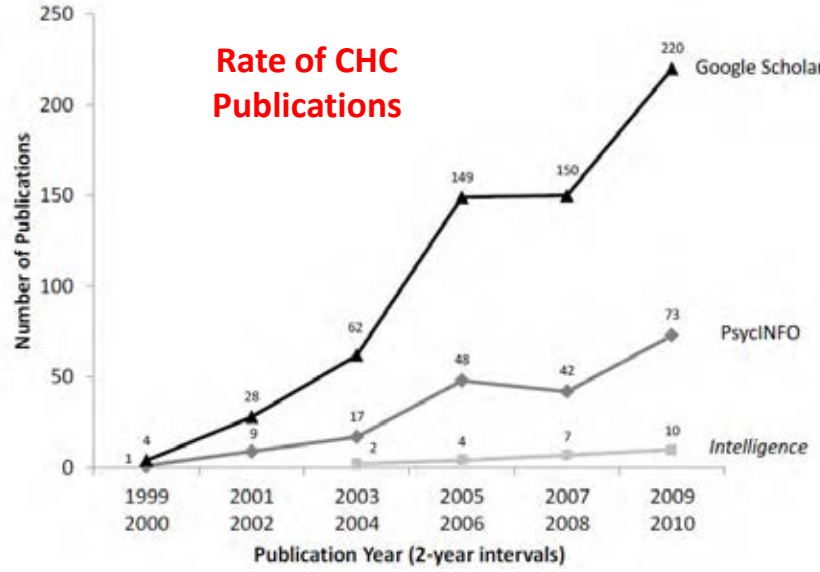


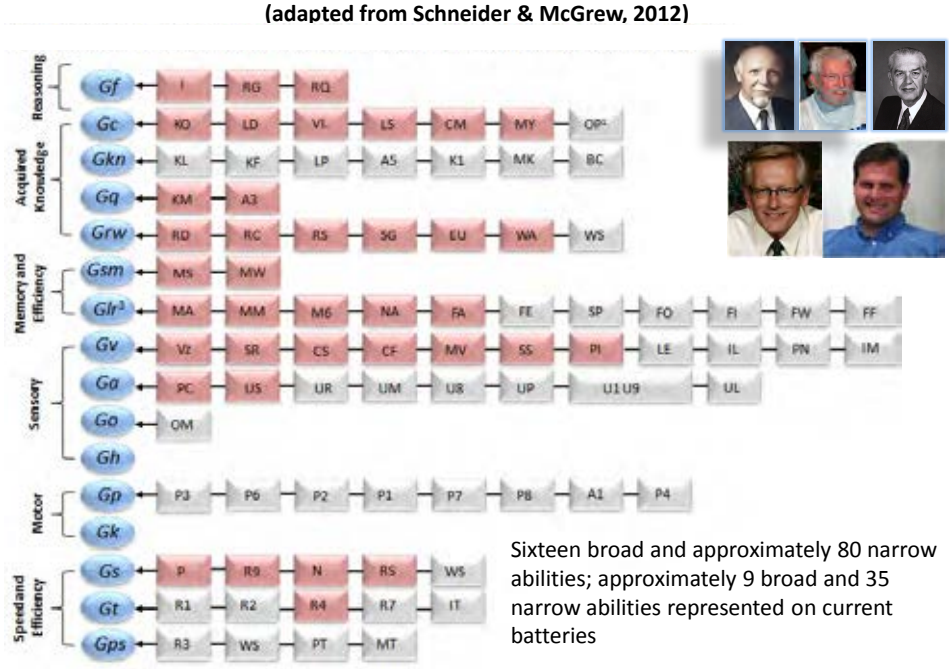

Figure from: Schneider and McGrew (2012). In Flanagan & Harrison (Eds.), *Contemporary Intellectual Assessment: Theories, Tests and Issues* (3rd edition). NY: Guilford.

# Continuum of Progress in Methods of Interpretation

| Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | Application of Theory to Interpretation (Fourth Wave) | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave) |
|---|---|---|---|

**McGrew (2005) and Schneider and McGrew's (2012) Refinements to CHC Theory**


**Current and Expanded Cattell-Horn-Carroll (CHC) Model of Cognitive Abilities**
**(adapted from Schneider & McGrew, 2012)**




Sixteen broad and approximately 80 narrow abilities; approximately 9 broad and 35 narrow abilities represented on current batteries

# Continuum of Progress in Methods of Interpretation

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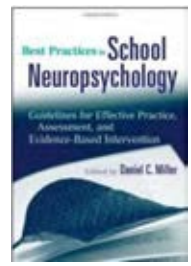
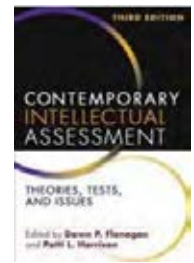
|---|---|---|---|

**Integration of CHC and neuropsychological theory for cognitive test interpretation and identification/diagnosis of SLD**




- Dan Miller
- Scott Decker
- Brad Hale
- Cyndi Riccio
- George McCloskey
- Denise Maricle

# Continuum of Progress in Methods of Interpretation

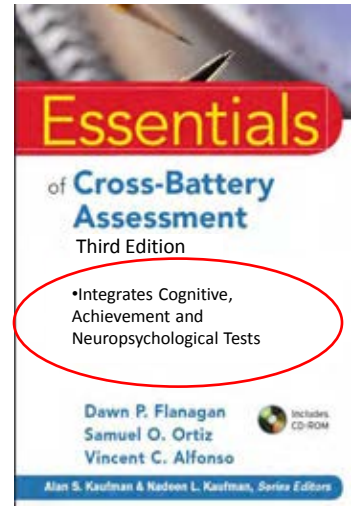
| Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | Application of Theory to Interpretation (Fourth Wave) | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave) |
|---|---|---|---|

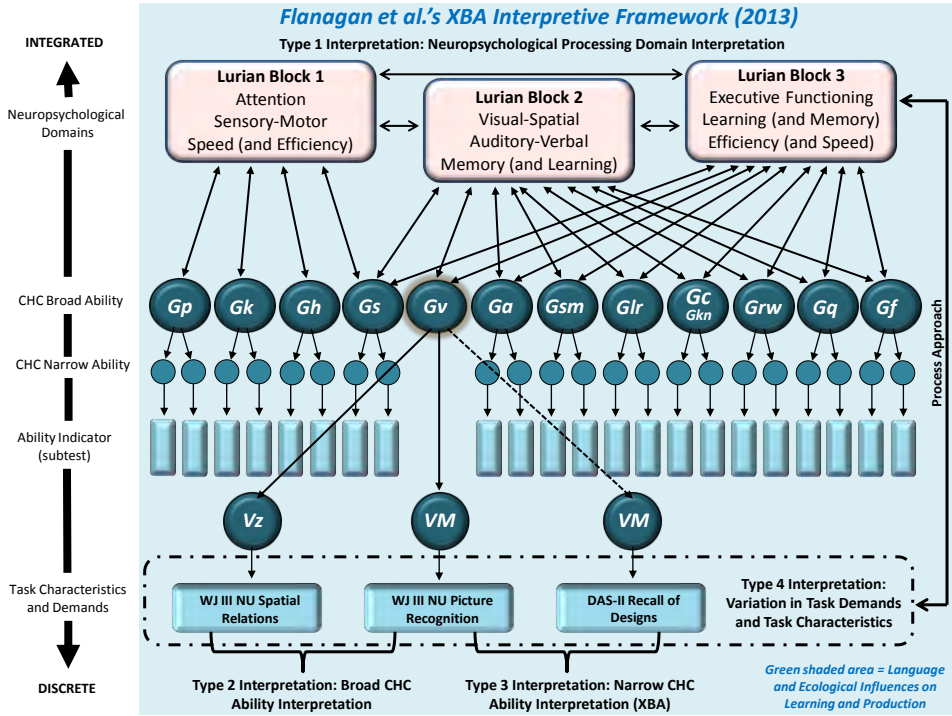
Refinements and Extensions to the Cross-Battery Approach

xba

Significantly improved evidence base

Significantly improved and expanded software programs






# Continuum of Progress in Methods of Interpretation

| Clinical Profile Analysis (Second Wave) | Psychometric Profile Analysis (Third Wave) | Application of Theory to Interpretation (Fourth Wave) | Application of Refinements to Theory and CHC-based Research to Psychological Test Interpretation (Fifth Wave) |
|---|---|---|---|

**Refinements and Extensions to the CHC-Achievement Relations Research**

Psychology in the Schools, Vol. 47(7), 2010
Published online in Wiley InterScience (www.interscience.wiley.com)

DOI: 10.1002/pits.20

CATTELL–HORN–CARROLL COGNITIVE-ACHIEVEMENT RELATIONS: WHAT WE HAVE LEARNED FROM THE PAST 20 YEARS OF RESEARCH

KEVIN S. McGREW AND BARBARA J. WENDLING
*Woodcock-Muñoz Foundation*

Contemporary Cattell – Horn – Carroll (CHC) theory of cognitive abilities has evolved over the past 20 years and serves as the theoretical foundation for a number of current cognitive ability assessments. CHC theory provides a means by which we can better understand the relationships between cognitive abilities and academic achievement, an important component of learning disabilities identification and instructional planning. A research synthesis of the extant CHC cognitive-achievement (COG-ACH) research literature is reported. Systematic and operationally defined research synthesis procedures were employed to address limitations present in the only prior attempted synthesis.

**Summary of Relations between CHC Abilities and Specific Areas of Academic Achievement**
**(Flanagan, Ortiz, Alfonso & Mascolo, 2006)**

| | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Gf* | Inductive (I) and general sequential reasoning (RG) abilities play a moderate role in **reading comprehension.** | **Inductive (I) and general sequential (RG) reasoning abilities are consistently very important for math problem solving at all ages.** | Inductive (I) and general sequential reasoning abilities (RG) are consistently related to **written expression** at all ages. |
| *Gc* | **Language development (LD), lexical knowledge (VL), and listening ability (LS) are important at all ages. These abilities become increasingly important with age.** | **Language development (LD), lexical knowledge (VL), and listening abilities (LS) are important at all ages. 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.** |
| *Gsm* | Memory span (MS) and **working memory capacity.** | Memory span (MS) and **working memory capacity.** | Memory span (MS) is important to writing, especially **spelling** skills whereas working memory has shown relations with advanced writing skills (e.g., written expression). |
| *Gv* | Orthographic Processing – **reading fluency** | Visualization is important primarily for higher level or **advanced mathematics** (e.g., geometry, calculus). | Orthographic Processing - **spelling** |
| *Ga* | **Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years.** | | **Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years for both basic writing skills and written expression (primarily before about grade 5).** |
| *Glr* | **Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years.** Associative memory (MA) is also important. | Naming Facility (NA); Associative Memory (MA) | Naming facility (NA) or "rapid automatic naming" has demonstrated relations with written expression, primarily **writing fluency**. |
| *Gs* | **Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.** | **Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.** | **Perceptual speed (P) abilities are important during all school years for basic writing and related to all ages for written expression.** |

# CHC Theory

- Guides Test Development and Interpretation
- Foundation of Cross-Battery Assessment
- Cognitive Ability and Processing-Achievement Link Facilitates Battery Organization and Interpretation
- ***CHC-based Cognitive Assessment Informs both Diagnosis and Intervention***

## Reading Disability Subtypes

- **Dysphonetic Dyslexia** – difficulty sounding out words in a phonological manner
- **Surface Dyslexia** – difficulty with the rapid and automatic recognition of words in print
- **Mixed Dyslexia** – multiple reading deficits characterized by impaired phonological and orthographic processing skills. It is probably the most severe form of dyslexia.
- **Comprehension Deficits** – the mechanical side of reading is fine but difficulty persists deriving meaning from print

**Feifer, S. (2011). How SLD Manifests in Reading Achievement. In Flanagan & Alfonso (Eds), *Essentials of Specific Learning Disability Identification*. Hoboken, NJ: Wiley.**

## Correspondence Between Diagnosis and Treatment

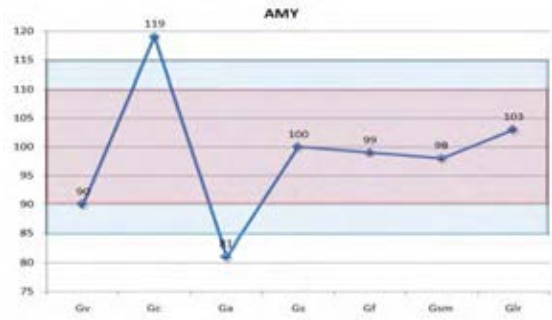
***as syndromes/disorders become more discretely defined, there may be a greater correspondence between diagnoses and treatment***

**Kratochwill and McGivern's (1996; p. 351)**

## Selecting Interventions Based on Reading Disorder Subtype

| Subtype | Brain relationship | Description of Disorder[2] | Intervention |
|---|---|---|---|
| Dysphonetic Dyslexia | *Supramarginal gyrus,* located at the juncture of the temporal and parietal lobes[1] | Difficulty sounding out words in a phonological manner; inability to use phonological route to bridge letters and sounds; over-reliance on visual or orthographic cues; tend to guess on words based on initial letters observed; typically memorize whole words | Intervention should include an explicit phonological approach, especially with younger children (e.g., Wilson Reading System; Fundations; Fast Forword; Earobics I). Modality based: Horizons (visual phonics approach). Lindamood (tactile cues). Secondary Level (morphological cues emphasized - Read 180) |
| Surface Dyslexia | Left *fusiform gyrus*[3] | Difficulty with the rapid and automatic recognition of words in print; can sound out words, but cannot recognize words in print automatically and effortlessly; letter-by-letter and sound-by-sound readers; over-reliance on phonological properties and underappreciation of orthographic or spatial properties of the word; reading is slow and laborious | Intervention should focus on automaticity and fluency goals (not necessarily an explicit phonological approach); build sight words. Early ages: Reading Recovery; Ages 7-12: Read Naturally; Over Age 12: Read 180; Wilson. |
| Mixed Dyslexia | Show weaker modulatory effects from the left *fusiform gyrus* to the left inferior pariental lobes, suggesting deficits integrating both the phonological representation and orthographical representation of words | Multiple reading deficits characterized by impaired phonological and orthographic processing skills. Most likely the most severe form of dyslexia; characterized by a combination of poor phonological processing skills, slower rapid and automatic word recognition skills, inconsistent language comprehension skills; bizarre error patterns in reading; *double-deficit*. | Intervention should incorporate a *balanced literacy* approach |
| Comprehension Deficits | The brain's *executive attention network* – modulated primarily by the *anterior cingulate gyrus* in the frontal lobes[4] | The mechanical side of reading is fine, but difficulty deriving meaning from print | Intervention should be at the *language* level, not the phonological level; externalize the reasoning process – Summarize, Clarify, Question and Predict |

## Different Cognitive Profiles Suggest Different Diagnoses/Classifications and Thus, Different Interventions




- Amy's cognitive testing shows a significant deficit in ***phonetic coding*** – she doesn't know how to translate symbols into sounds
- *Ga* deficit impacts her fluency – labored reading
- Lack of decoding and fluency impacts comprehension
- *Intervention should focus on Phonemic Awareness (phoneme-grapheme corresponence) – Remediate Ga*

Mascolo and Flanagan (2011)

# Amy's Profile

- **Dysphonetic Dyslexia**
- Interventions selected should be based, in part, on the developmental level of the student
  - Intervention should include an ***explicit phonological approach***, especially with younger children (e.g., Wilson Reading System; Fundations; Fast Forword; Earobics I; Alphabetic Phonics [Uhry & Clark, 2005]). Modality based: Horizons (visual phonics approach). Lindamood (tactile cues). Secondary Level (morphological cues emphasized - Read 180)

**For more information see Steve Feifter (in press), Tailoring Interventions for Students with Reading Difficulties, in Mascolo, Flanagan, & Alfonso (Eds.) (in press).** ***Essentials of Planning, Selecting, and Tailoring Interventions for the Unique Learner*****. Hoboken, NJ: Wiley.**

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INTERVENTION: AUDITORY DISCRIMINATION IN DEPTH (ADD) / LINDAMOOD PHONEMIC SEQUENCING (LIPS)

April 23, 2007

Overview
Program information
Research
Effectiveness
References
Appendices
Beginning Reading
PDF: Intervention Report (757 KB)
PDF: Technical Appendices (768 KB)

**Overview**

The *Auditory Discrimination in Depth (ADD) Program*® (currently called the *Lindamood Phonemic Sequencing (LiPS) Program*®) is designed to teach students skills to successfully decode words and to identify individual sounds and blends in words. Initial activities engage students in discovering the lip, tongue, and mouth actions needed to produce specific sounds. After students are able to produce, label, and organize the sounds with their mouths, subsequent activities in sequencing, reading, and spelling use the oral aspects of sounds to identify and order them within words. The program also offers direct instruction in letter patterns, sight words, and context clues in reading. The *Auditory Discrimination in Depth Program*® is individualized to meet students' needs and is often used with students who have learning disabilities or difficulties. The version of the program tested here involved computer-supported activities.

**Research**

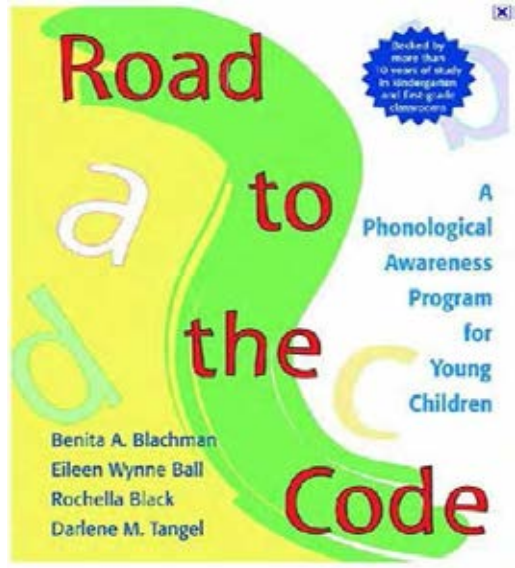
One study of *Auditory Discrimination in Depth*® met the What Works Clearinghouse (WWC) evidence standards. The study included 150 first grade students in five elementary schools. [1]

The WWC considers the extent of evidence for *Auditory Discrimination in Depth*® to be small for alphabetics and comprehension. No studies of *Auditory Discrimination in Depth*® that met WWC standards with or without reservations addressed outcomes in the domains of fluency and general reading achievement.

# Another Program for Ga-Phonetic Coding Deficit

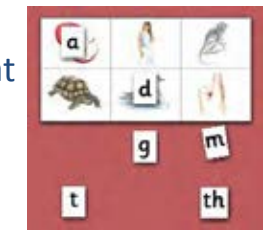
## *Wilson Reading®*


## Another Program for Ga-Phonetic Coding Deficit



# Programs/Techniques for Ga-Phonetic Coding Deficits

- When selecting a program or a technique to intervene with a student with a *Ga-Phonetic Coding* deficit, consider one that
  - ***Teaches students to manipulate sounds by using letters (i.e., phoneme-grapheme correspondence)***
  - Uses individual or small group format
  - Focuses on reading and spelling development (again, the phoneme-grapheme connection)
  - Explicitly teaches student how to blend sounds

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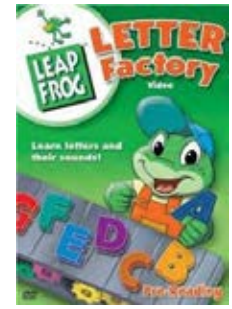
DOINGWHATWORKS

| Essential Component | Definition | High Priority Skill | Examples | Instructional research |
|---|---|---|---|---|
| Phonemic Awareness | Awareness that spoken words are made up of individual sounds. | Blending 2 and 3 sounds to make spoken words.<br><br>Segmenting spoken words into individual sounds | Teacher places three pictures on the board. She says three sounds out loud that represent the name of one of the pictures. Student listens and says the word.<br><br>Students move three chips into the sound boxes as they say single sounds of the word /h/ /ou/ /se/ (house). | Make sure students know meanings of words that are used in sound blending and sound segmenting activities. |
| Alphabetic Principle<br>Phonics | Understanding that words are made up of letters, sounds are connected to letters, and can use these letter and letter combinations to read and spell unfamiliar words. | Blends sounds in printed words together and reads words as a whole accurately. | Teacher tells students –dge and –ge both stand for /j/ at the ends of words. Students sort 20 –ge and –dge words to determine when –dge spelling is used. Students read the words when done.<br><br>The teacher points to the written word matador and asks the student how many syllables or parts are in the word. | Keep the end in mind. Have students apply phonics skills daily in reading and writing activities. |

## Recommendation for Parents of Young Children

- The Letter Factory by Leap Frog
- Talking Word Factory by Leap Frog





## Better Understanding of the Problem Leads to Better Diagnosis and Intervention Planning

## What Parents and Teachers Should Know About Cognitive Abilities and Their Impact on Academic Skills and Academic Success

# Definitions of CHC Broad and Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Fluid Reasoning (Gf) | The deliberate but flexible control of attention to solve novel, "on-the-spot" problems that cannot be performed by relying exclusively on previously learned habits, schemas, and scripts. |
| Induction (I) | The ability to observe a phenomenon and discover the underlying principles or rules that determine its behavior. |
| General Sequential Reasoning (RG) | The ability to reason logically, using known premises and principles. |
| Quantitative Reasoning (RQ) | The ability to reason, either with induction or deduction, with numbers, mathematical relations, and operators. |

***Refinements***: Piagetian Reasoning (RP) and Reasoning Speed (RE) were deemphasized, primarily because there is little evidence that they are distinct factors.

# 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.

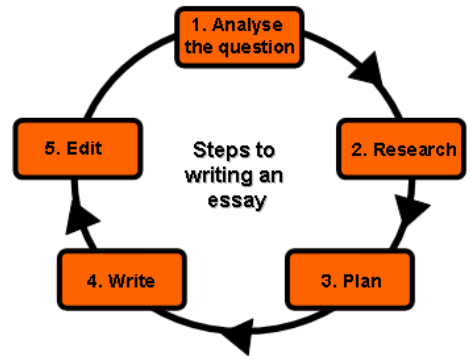
- forming and recognizing concepts (e.g., how are a dog, cat, and cow alike?)
- identifying and perceiving relationships (e.g., sun is to morning as moon is to *night*)
- drawing inferences (e.g., after reading a story, answering the question, "What will John do next?")
- reorganizing or transforming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

## Relations between Gf and Reading Achievement

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

## Relations between Gf and Achievement

Quantitative Reasoning (RQ) consistently related to math achievement




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

| | Gf | |
|---|---|---|
| *WISC-IV* | Matrix Reasoning (I)<br>Picture Concepts (I) | Under-represented; no RG or RQ |
| *WAIS-IV* | Matrix Reasoning (I)<br>Figure Weights (RQ) | No RG |
| *WPPSI-III* | Matrix Reasoning (I) | Under-represented; no RG or RQ |
| *KABC-II* | Pattern Reasoning (I; Gv:Vz)<br>Story Completion (RG; Gc:K0) | Involves more Gc than other batteries; see KTEA-II for RQ |
| *WJ III NU* | Concept Formation (I)<br>Analysis-Synthesis (RG) | See WJ III ACH for RQ |
| *SB5* | Nonverbal Fluid Reasoning (I, Gv)<br>Verbal Fluid Reasoning (I, RG, Gc:Cbl)<br>Nonverbal Quantitative Reasoning (RQ, Gq:A3)<br>Verbal Quantitative Reasoning (RQ, Gq:A3) | Only cognitive test to assess all three Gf narrow abilities |
| *DAS-II* | Matrices (I)<br>Picture Similarities (I)<br>Sequential & Quantitative Reasoning (RQ) | No direct measure of RG, although RG is involved on the Sequential and Quantitative Reasoning subtest; statistically linked to WIAT-III |

# Jobs/Careers involving High Gf

- Judges
- Surgeons
- Lawyers
- Chief Executives

# Definitions of CHC Broad and Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Crystallized Intelligence (Gc) | The depth and breadth and of knowledge and skills that are valued by one's culture. |
| General Verbal Information (K0) | The breadth and depth of knowledge that one's culture deems essential, practical, or otherwise worthwhile for everyone to know. |
| Language Development (LD) | General understanding of spoken language at the level of words, idioms, and sentences. |
| Lexical Knowledge (VL) | Extent of vocabulary that can be understood in terms of correct word meanings. |

# Additional Gc Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Crystallized Intelligence (Gc) | The depth and breadth and of knowledge and skills that are valued by one's culture. |
| Listening Ability (LS) | The ability to understand speech. |
| Communication Ability (CM) | The ability to use speech to communicate one's thoughts clearly. |
| Grammatical Sensitivity (MY) | Awareness of the formal rules of grammar and morphology of words in speech. |

## What is Crystallized Intelligence (Gc)?

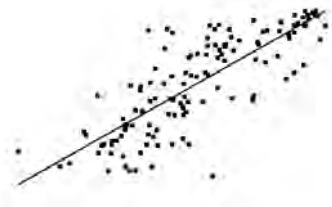
- a person's knowledge base (or general fund of information) that has built up over time, beginning in infancy.
- your own personal library or everything you know.

## What is Crystallized Intelligence (Gc)?

- 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.

## Relations between Gc Abilities and Reading Achievement

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



## Relations between Gc Abilities and Achievement

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

| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Gc* | **Language development (LD), lexical knowledge (VL), General Information (K0) and listening ability (LS) are important at all ages. These abilities become increasingly important with age.** | **Language development (LD), lexical knowledge (VL), and listening abilities (LS) are important at all ages. These abilities become increasingly important with age.** | **Language development (LD), lexical knowledge (VL), and general information (K0) are important beginning around the 3rd grade. These abilities become increasingly important with age.** |

| | Gc | |
|---|---|---|
| WISC-IV | Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, Gf-I)<br>Comprehension (K0)<br>Word Reasoning (VL, Gf-I) | Good Gc representation; no LS, MY and CM (see WIAT-III) |
| WAIS-IV | Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, Gf-I)<br>Comprehension (K0) | Good Gc representation; no LS, MY and CM (see WIAT-III) |
| WPPSI-III | Picture Concepts (Gc-K0, Gf-I)<br>Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, Gf-I)<br>Comprehension (K0)<br>Receptive Vocabulary (VL)<br>Picture Naming (VL)<br>Word Reasoning (VL, Gf-I) | Over-representation of VL and K0; no LS, MY and CM (see WIAT-III) |
| KABC-II | Expressive Vocabulary (VL)<br>Verbal Knowledge (VL, K0)<br>Riddles (VL, Gf-RG) | Mainly measures Lexical Knowledge; K0 not well represented; see co-normed KTEA-II for other Gc narrow abilities |
| WJ III NU | Verbal Comprehension (VL, Gf-I)<br>General Information (K0) | Adequate Gc representation; no LS, MY and CM (see WJ III ACH) |
| SB5 | Nonverbal Knowledge (K0, LS, Gf-RG)<br>Verbal Knowledge (VL,K0) | Adequate Gc representation; no LS, MY and CM (statistically linked to WJ III ACH) |
| DAS-II | Early Number Concepts (VL, Gq-A1)<br>Naming Vocabulary (VL)<br>Word Definitions (VL)<br>Verbal Comprehension (LS)<br>Verbal Similarities (VL, Gf-I) | Only cognitive battery with LS representation; no MY and CM (statistically linked to WIAT-III) |

# Jobs/Careers involving High Gc

- Teaching English, language arts, drama, and debate at k-12 or postsecondary institutions
- professional writer; creative writer
- News correspondent

Based on logical deductions given demands of the job; see also McGrew and Flanagan (1998) for research support

# Definitions of CHC Broad and Narrow Abilities

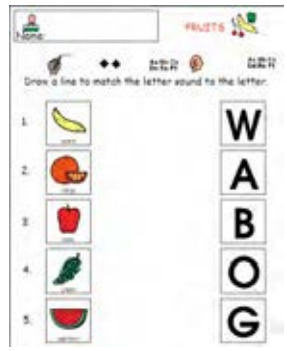
| Broad Ability | Definition |
|---|---|
| Auditory Processing (Ga) | The ability to detect and process meaningful nonverbal information in sound. |
| Phonetic coding (PC) | The ability to hear phonemes distinctly. |
| Speech Sound Discrimination (US) | The ability to detect and discriminate differences in speech sounds (other than phonemes) under conditions of little distraction or distortion. |
| Resistance to Auditory Stimulus Distortion (UR) | The ability to hear words correctly even under conditions of distortion or loud background noise. |

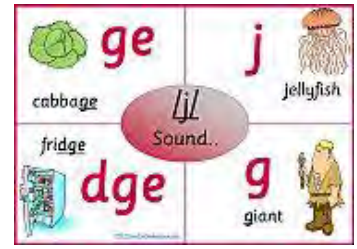
# What is Auditory Processing (Ga)?

- Auditory processing (Ga) refers to the ability to perceive, analyze, and synthesize a variety of auditory information (e.g., sounds).
  - auditory processing include listening to words with missing letters and saying the correct word (e.g., hearing “olipop” and saying “lollipop”)
  - listening to piano music and identifying the key in which the piece is being played (e.g., C sharp)

# What is Auditory Processing (Ga)?

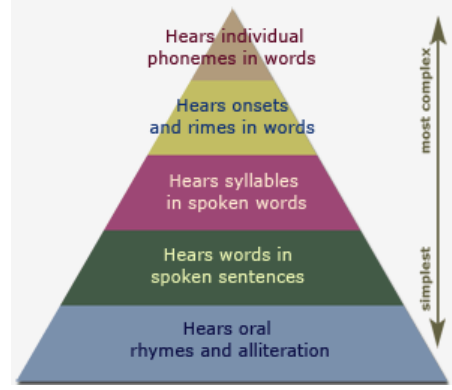
- Children who have difficulty with processing auditory information may have problems with learning letter-to-sound correspondence (e.g., listening to the sound “ba” and identifying it as the letter “b” when given a list of letters to choose from), reading nonsense words (e.g., bab), and sounding out words because of difficulty segmenting, analyzing, and synthesizing speech sounds.



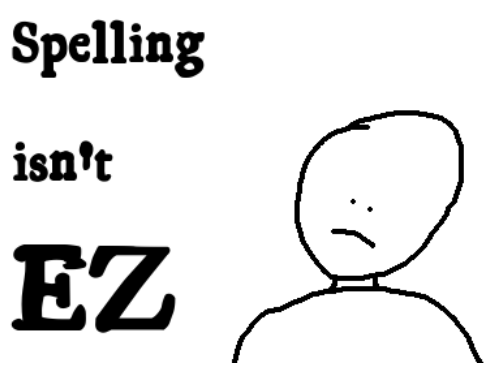




## Relations between Ga and Reading Achievement

- ***Ga*** – Phonetic Coding (PC) or phonological awareness; phonological processing – very important during the elementary school years.



## Relations between Ga and Achievement




| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Ga* | **Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years.** | | Phonetic coding (PC) or "phonological awareness/processing" is important during the elementary school years for both basic writing skills and written expression. |

| | Ga |
|---|---|
| *WISC-IV* | Not Measured |
| *WAIS-IV* | Not Measured |
| *WPPSI-III* | Not Measured |
| *KABC-II* | Not Measured |
| *WJ III NU* | Sound Blending (PC)<br>Auditory Attention (UR)<br>Incomplete Words (PC) |
| *SB5* | Not Measured |
| *DAS-II* | Phonological Processing (PC) |

## Most Intelligence and Cognitive Batteries do not Measure Ga

Only cognitive battery with adequate Ga representation

Contains a measure of Ga-PC

## Assessing Phonological Processing Related to Reading

- Examples of assessments of phonological processing directly related to reading:
  - PAL-II Rhyming, Syllables, Phonemes, Rimes
  - KTEA-II Phonological Awareness Subtest
  - NEPSY-II Phonological Processing Subtest
  - WJ III Sound Awareness, Sound Blending, and Incomplete Words Subtests
  - DAS-II Phonological Processing Subtest
  - CTOPP Blending and Segmenting Subtests

# Jobs/Careers involving High Ga

- Musician
- Conductor
- Music Teacher – fundamentals of pitch and rhythm
- Taking oral dictation

Based on logical deductions given demands of the job; see also McGrew and Flanagan (1998) for research support

# Definitions of CHC Broad and Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Short-Term Memory (Gsm) | The ability to encode, maintain and manipulate information in one's immediate awareness. |
| Memory Span (MS) | The ability to maintain information in primary memory and immediately reproduce the information in the same sequence in which it was represented. |
| Working Memory Capacity (MW) | The ability to direct the focus of attention to perform relatively simple manipulations, combinations, and transformations of information within primary memory, while avoiding distracting stimuli and engaging in strategic/controlled searches for information in secondary memory. |

# What is Short-term Memory (Gsm)?

- Short-term 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.

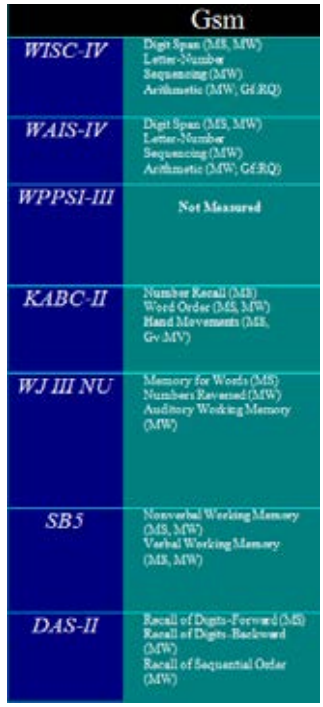
  - Working memory is also part of the short-term memory system and involves manipulating or transforming information and using it in some way (e.g., saying the months of the year backwards).

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 |

# What is Short-term Memory (Gsm)?

- A child with short-term memory difficulties 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
- Children who have difficulties with short-term memory do better when they are *taught how to use strategies* to help them remember things.
  - Mnemonics




**Nearly all Intelligence and Cognitive Batteries assess MW via Auditory-Verbal input**

**No measures of Working Memory Capacity**

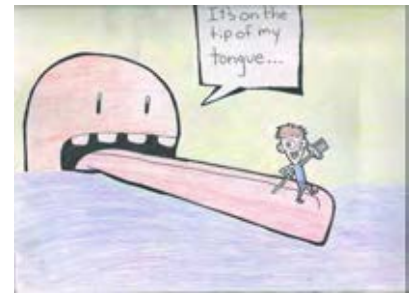
**Only battery with visual-spatial MW**

## What is 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.




# Definitions of CHC Broad and Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Long-Term Storage and Retrieval (Glr) | The ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years. |

**Learning Efficiency**

| | |
|---|---|
| Associative Memory (MA) | The ability to remember previously unrelated information as having been paired. |
| Meaningful Memory (MM) | The ability to remember narratives and other forms of semantically related information. |
| Free Recall Memory (M6) | The ability to recall lists in any order. |

# Additional Glr Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Long-Term Storage and Retrieval (Glr) | The ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years. |
| **Retrieval Fluency** | |
| Ideational Fluency (FI) | The ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object. |
| Word Fluency (FW) | The ability to rapidly produce words that share a non-semantic feature. |
| Figural Fluency (FF) | Ability to rapidly draw or sketch as many things (or elaborations) as possible when presented with a non-meaningful visual stimulus (e.g., a set of unique visual elements). |
| Naming Facility (NA) | The ability to rapidly name pictures, letters or objects that are known to the individual. |

## Schneider and McGrew's Conceptualization of Gsm and Glr in Contemporary CHC Theory

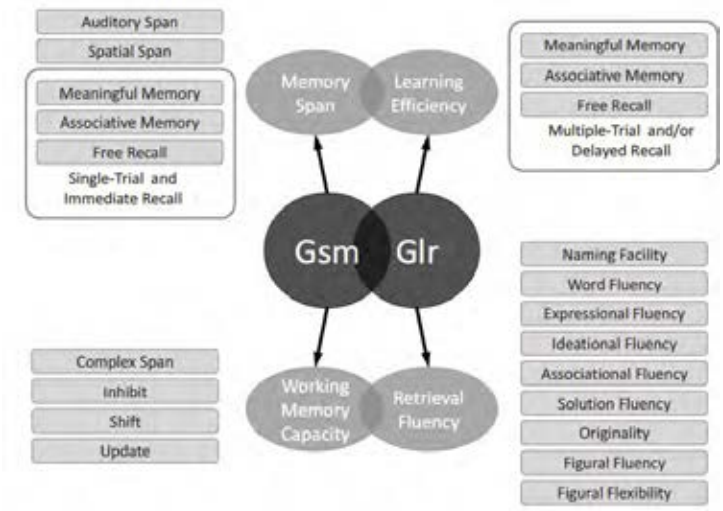
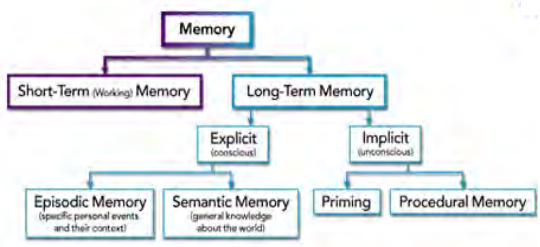
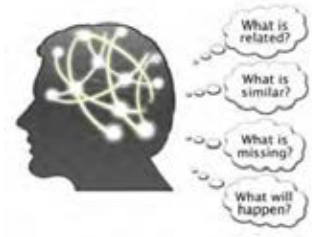



*Figure 4.6. Conceptual map of memory-related abilities in CHC theory.*

# Relations between Glr and Reading Achievement

*Glr* – Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years. Associative memory (MA) also appears to be important in the early elementary school years.




| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| Glr | **Naming facility (NA) or "rapid automatic naming" is very important during the elementary school years.** Associative memory (MA) is also important. | | Naming facility (NA) or "rapid automatic naming" has demonstrated relations with written expression, primarily the fluency aspect of writing. |

| | Glr |
|---|---|
| *WISC-IV* | **Not Measured** |
| *WAIS-IV* | **Not Measured** |
| *WPPSI-III* | **Not Measured** |
| *KABC-II* | Atlantis (MA)<br>Rebus (MA)<br>Atlantis Delayed (MA)<br>Rebus Delayed (MA) |
| *WJ III NU* | Visual-Auditory Learning (MA)<br>Retrieval Fluency (FI)<br>Visual-Auditory Learning Delayed (MA)<br>Rapid Picture Naming (NA; Gs:R9) |
| *SB5* | **Not Measured** |
| *DAS-II* | Rapid Naming (NA; Gs:R9)[2]<br>Recall of Objects-Immediate (M6)<br>Recall of Objects-Delayed (M6) |

**Most Intelligence and Cognitive Batteries do not Measure Glr**

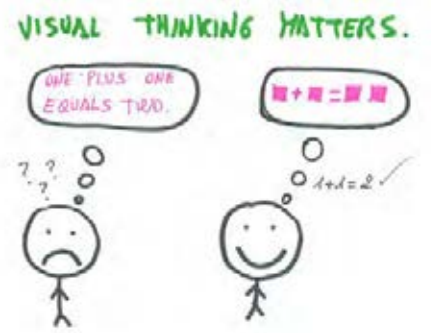
Measures Associative Memory only – Learning Efficiency

Measures Learning Efficiency (MA) and Retrieval Fluency (NA, FI)

Measures Learning Efficiency (M6) and Retrieval Fluency (NA)

# What is Visual Processing (Gv)?

- Visual processing (Gv) is an individual's ability to think about visual patterns (e.g., what is the shortest route from your house to school?) and visual images (e.g., what would this shape look like if I turned it upside down?).




# What is Visual Processing (Gv)?

- This type of ability also involves generating, perceiving, and analyzing visual patterns and visual information.
  - putting puzzles together
  - completing a maze (such as the ones often seen on children's menus in restaurants)
  - interpreting a graph or chart.
- Important when doing advanced math (e.g., geometry and calculus).

# Definitions of CHC Broad and Narrow Abilities

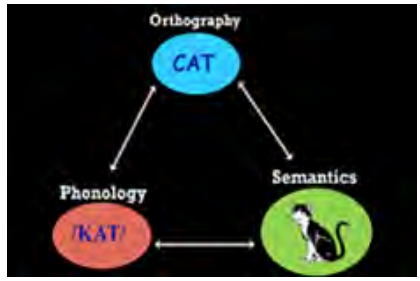
| Broad Ability | Definition |
|---|---|
| Visual Processing (Gv) | The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems. |
| Visualization (Vz) | The ability to perceive complex patterns and mentally simulate how they might look when transformed (e.g., rotated, changed in size, partially obscured). |
| Speeded Rotation (SR) | The ability to solve problems quickly by using mental rotation of simple images. |
| Closure Speed (CS) | The ability to quickly identify a familiar meaningful visual object from incomplete (e.g., vague, partially obscured, disconnected) visual stimuli, without knowing in advance what the object is. |

# Additional Gv Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Visual Processing (Gv) | The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems. |
| Visual Memory (MV) | The ability to remember complex visual images over short periods of time (less than 30 seconds). |
| Spatial Scanning (SS) | The ability to visualize a path out of a maze or a field with many obstacles. |

## Relations between Gv Abilities and Achievement

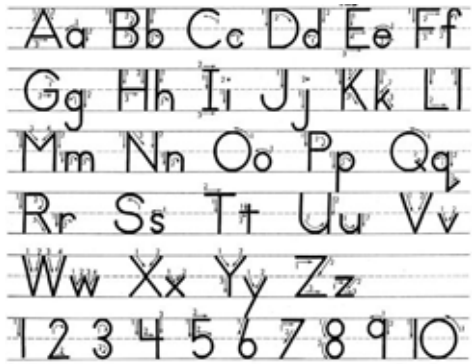
- ***Gv*** – Orthographic processing

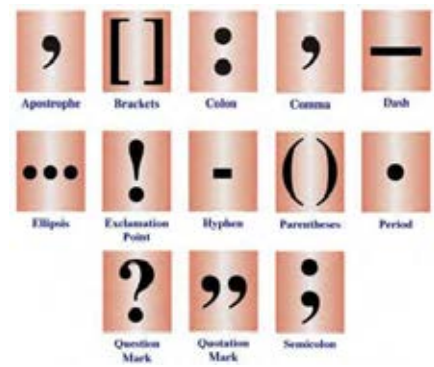




## Orthography (Wagner & Barker, 1994)

- The system of marks that make up the English language, including upper and lower case letters, numbers, and punctuation marks



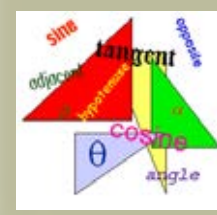



## Assessing Visual Processing Related to Reading

- Visual processing must be assessed using *orthography* (letters, words and numbers) rather than abstract designs or familiar pictures


# Relationship Between Gv and Achievement

| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Gv* | Orthographic processing (e.g., visual processing using letters and sub-word sound units) is important for reading decoding. | Visualization (Vz) may be important primarily for higher level or advanced mathematics (e.g., geometry, calculus). | Orthographic processing (e.g., visual processing using letters and sub-word sound units) is important for spelling. |




| | Gv |
|---|---|
| *WISC-IV* | Block Design (Vz)<br>Picture Completion (CF, Gc:K0) |
| *WAIS-IV* | Block Design (Vz)<br>Picture Completion (CF, Gc:K0)<br>Visual Puzzles (Vz) |
| *WPPSI-III* | Block Design (Vz)<br>Object Assembly (CS)<br>Picture Completion (CF, Gc:K0) |
| *KABC-II* | Face Recognition (MV)<br>Triangles (Vz)<br>Gestalt Closure (CS)<br>Rover (SS, Gf:RG)<br>Block Counting (Vz)<br>Conceptual Thinking (Vz, Gf:I) |
| *WJ III NU* | Spatial Relations (Vz)<br>Picture Recognition (MV)<br>Planning (SS, Gf:RG) |
| *SB5* | Nonverbal Visual-Spatial Processing (Vz)<br>Verbal Visual-Spatial Processing (Vz, Gc:VL, K0) |
| *DAS-II* | Pattern Construction (Vz)<br>Recall of Designs (MV)<br>Recognition of Pictures (MV)<br>Copying (Vz)<br>Matching Letter-Like Forms (Vz) |

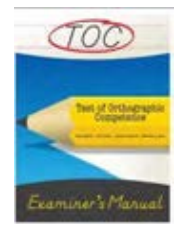
**Good representation of Gv abilities; three qualitatively different indicators**

**No measures of Orthographic Processing on Intelligence and Cognitive Batteries**

Most under-represented in area of Gv

## Assessing Orthographic Processing Related to Reading

- *Examples of assessments of orthographic processing directly related to reading:*
  - Test of Silent Word Reading Fluency (TOSWRF)
  - Test of Irregular Word Reading Efficiency (TIWRE)
  - Test of Orthographic Competence (TOC)
  - Process Assessment of the Learner (PAL-II)
  - Early Reading Assessment (ERA)


# What is Processing Speed (Gs)?


- Processing speed (Gs) refers to an individual's ability to perform simple clerical tasks quickly, especially when under pressure to maintain attention and concentration.
- It can also be thought of as how quickly one can think or how quickly one can take simple tests that require simple decisions.
- Involves sustained/focused and selective attention.

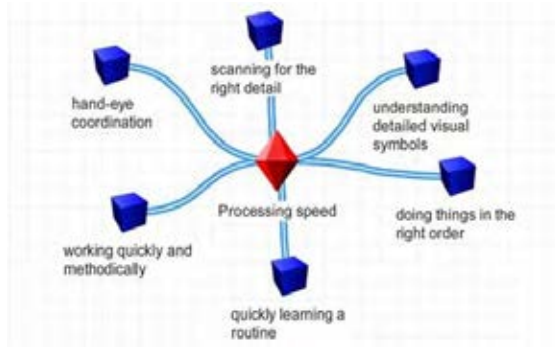
## Definitions of CHC Broad and Narrow Abilities

| Broad Ability | Definition |
|---|---|
| Processing Speed (Gs) | The speed at which visual stimuli can be compared for similarity or difference. |

| | |
|---|---|
| Perceptual Speed (P) | The ability at which visual stimuli can be compared for similarity or difference. |
| Rate-of-Test-Taking (R9) | The speed and fluency with which simple cognitive tests are completed. |
| Number Facility (N) | The speed at which basic arithmetic operations are performed accurately. |
| Reading Speed (RS) | The rate of reading text with full comprehension. |
| Writing Speed (WS) | The rate at which words or sentences can be generated or copied. |

# Relations between Gs and Achievement

- ***Gs*** – Perceptual speed (P) abilities are important during all school years, particularly the elementary school years.




| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Gs* | **Perceptual speed (P) is important during all school years, particularly the elementary school years.** | **Perceptual speed (P) is important during all school years, particularly the elementary school years.** | **Perceptual speed (P) is important during all school years for basic writing and written expression.** |

| | Gs |
|---|---|
| *WISC-IV* | Symbol Search (P)<br>Coding (R9)<br>Cancellation (P) |
| *WAIS-IV* | Symbol Search (P)<br>Coding (R9)<br>Cancellation (P) |
| *WPPSI-III* | Coding (R9)<br>Symbol Search (P) |
| *KABC-II* | **Not Measured** |
| *WJ III NU* | Visual Matching (P)<br>Decision Speed (P)<br>Pair Cancellation (P) |
| *SB5* | **Not Measured** |
| *DAS-II* | Speed of Information Processing (P) |

**Most Intelligence and Cognitive Batteries Measure Perceptual Speed – Sustained Attention; Selective Attention**

**KABC-II and SB5 do not measure Gs - test authors do not deny the importance of Gs in learning and achievement**

**N, RS and WS are measured by Achievement Batteries**

# What Combinations of Abilities Are Important for Different Achievements

- Fluid Reasoning – *Gf*
- Crystallized Knowledge – *Gc*
- Short-term Memory – *Gsm*
- Long-term Storage and Retrieval – *Glr*
- Visual Processing – *Gv*
- Auditory Processing – *Ga*
- Processing Speed – *Gs*

## Top Four Most Important Abilities for Learning and Academic Success

- ***Fluid Reasoning (Gf)***
- ***Crystallized Knowledge (Gc)***
  - Weaknesses in these abilities constrain learning and achievement
- **Executive Functions** – lead to inconsistencies in Learning and Achievement
- ***Short-Term Memory (Gsm)***
- ***Long-Term Storage and Retrieval (Glr)***
  - Memory, Retrieval Fluency, and Learning Efficiency
  - Weaknesses in these abilities can be improved upon, bypassed or compensated for at least to some degree
- Important Processes (related to reading)
  - ***Auditory Processing – Phonetic Coding***
  - ***Visual Processing – Orthographic Processing***
  - ***Processing Speed – Reading Fluency/Automaticity***
    - Train processing deficits to point where they become skill

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

## CHC Diagnostic Reading XBA Assessment

| Broad CHC Markers | Narrow CHC Markers | Relevant WISC-IV tests | XBA with Selected Tests from WJ III and ERA |
|---|---|---|---|
| *Gsm* Short-Term Memory | Working Memory (MW) | *Digit Span (MS/MW)<br>* Letter-Number Seq. (MW) | ***14 Subtests – More Areas Assessed Than Any Stand Alone Battery*** |
| *Gs* Processing Speed | Perceptual Speed (P) | * Coding (P)<br>* Symbol Search (P)<br>Cancellation (P) | |
| *Gc* Crystallized Intelligence | Language Dev. (LD)<br>Listening Ability (LS)<br>General Information (K0)<br>Lexical Knowledge (VL) | * Vocabulary (VL)<br>* Similarities (VL)<br>* Comprehension (LD)<br>Information (K0)<br>Word Reasoning (VL) | |
| *Glr* Long-Term Retrieval | Associative Mem. (MA)<br>Naming Facility (NA) | | * Visual-Auditory Learning (MA)<br>* Rapid Pic. Nam. (NA)<br>* Retrieval Fluency (FI) } Fluency |
| *Ga* Auditory Processing | Phonetic Coding (PC) | | * Sound Aware (PC/MW)<br>* Sound Blending (PC) |
| *Gv* Visual Processing | Orthographic Processing | | * Rapid Orthographic Naming<br>* Silent Orthographic Efficiency |

**Basic Reading Skills Referral for ages 6 to 8 – WISC-IV Selected as Core Battery**

See *Essentials of Cross-Battery Assessment, 3rd edition* (Flanagan, Ortiz, & Alfonso, 2013) for more examples

# The Cross-Battery Assessment Approach


**Flanagan, Ortiz, and Alfonso, (2013).** ***Essentials of Cross-Battery Assessment, 3rd edition. Wiley***

## The CHC Cross-Battery Assessment (XBA) Approach

- Guidelines for Test Selection and Organization
- Classification of Subtests According to CHC Cognitive and Academic Abilities and Neuropsychological Processes
- Guidelines for Hypothesis Testing
- Guidelines for Test Interpretation
- Automated Program to Facilitate Data Management, Interpretation, and Reporting of Test Performance

## What is Cross-Battery Assessment?

- An approach that neuropsychologists, and astute clinicians in other assessment-related fields, have always followed
- *Flanagan and colleagues transformed the practice of crossing batteries into a method that is both psychometrically and theoretically defensible*
  - A systematic method of ensuring adequate construct representation across a wide range of cognitive and academic abilities and neuropsychological processes
  - A systematic method of interpreting test data from more than one battery

## The Need for Cross-Battery Assessment

***A WISC-III detective strives to use ingenuity, clinical sense, a thorough grounding in psychological theory and research, and a willingness to administer supplementary cognitive tests to reveal the dynamics of a child's scaled-score profile***

**(Kaufman, 1994)**

# Cross-Battery Assessment

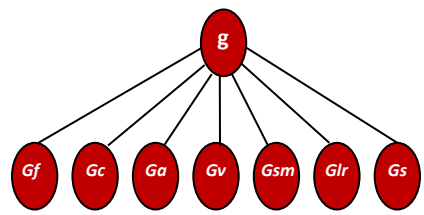
- Based on CHC theory
- Classification System – Common nomenclature for test development and interpretation
- Allows for greater breadth and depth of measurement of cognitive abilities in assessment
- First systematic theoretically and psychometrically defensible means of "crossing" batteries

# Brief Overview of What's New to the Cross-Battery Assessment Approach

## Rapid Reference 1.2

*What's New to This Edition?*

- Use of expanded CHC theory (e.g., Schneider & McGrew, 2012) and its research base as the foundation for organizing assessments and interpreting ability test performance.



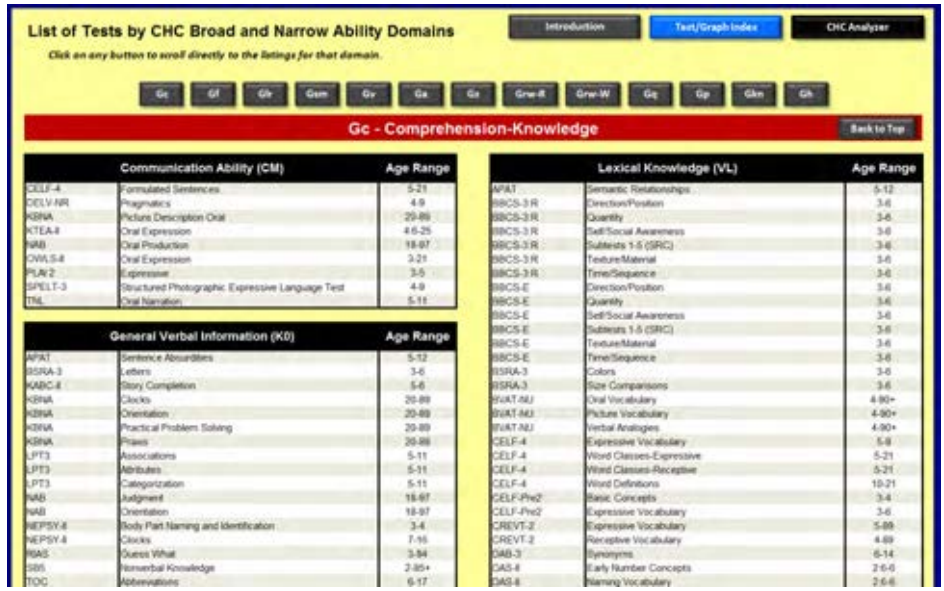
## Rapid Reference 1.2

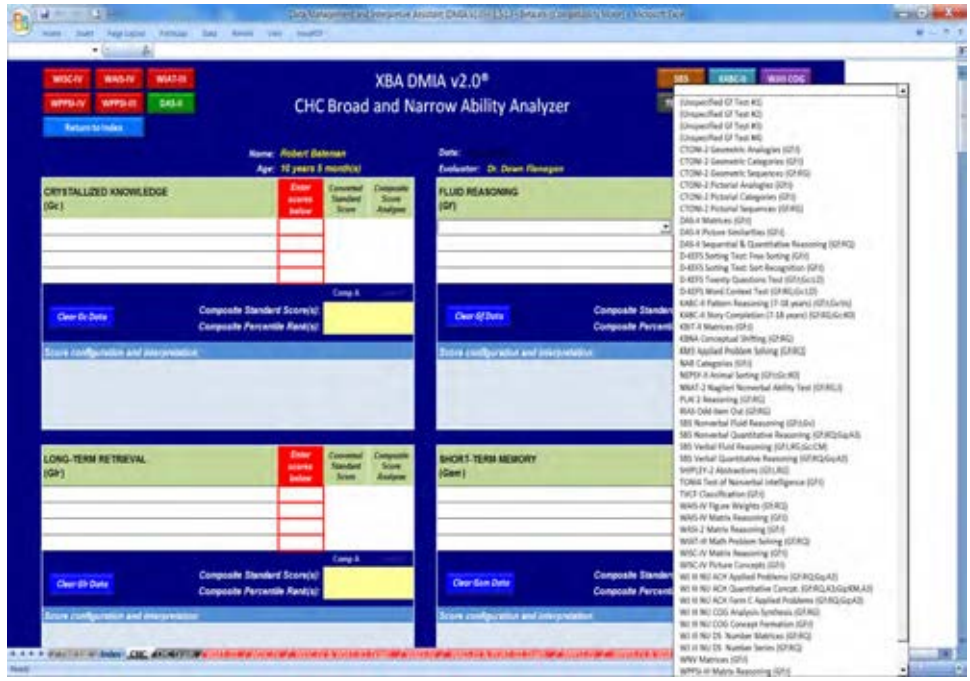
*What's New to This Edition?*

- Inclusion of all current intelligence batteries (i.e., WJ III NU, WPPSI-III, WPPSI-IV, WISC-IV, SB5, KABC-II, DAS-II, and WAIS-IV), major tests of academic achievement (e.g., WJ III NU ACH, KTEA-II, WIAT-III, KeyMath3, WRMT-3), selected neuropsychological instruments (e.g., D-KEFS, NEPSY-II), and numerous special-purpose tests (e.g., speech-language tests, memory tests, phonological processing tests, orthographic processing, and fine motor tests).

WPPSI™-IV
WECHSLER PRESCHOOL AND PRIMARY SCALE OF INTELLIGENCE® — FOURTH EDITION

**Appendix B in Book *or* on CD *or* on DMIA**

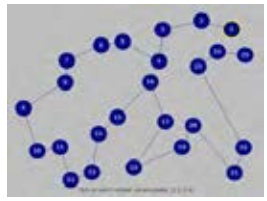


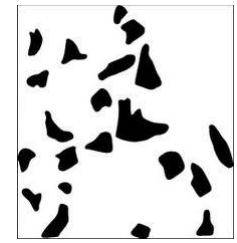


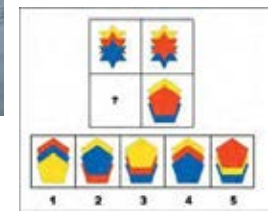

## *Rapid Reference 1.2*

*What's New to This Edition?*

- Classification of nearly 800 tests and subtests according to CHC theory only or according to both CHC theory and neuropsychological domains (e.g., sensory-motor, visual-spatial, speed and efficiency, executive).





# New Features in XBA3

CLASSIFIES ALL TESTS ACCORDING TO NEUROPSYCHOLOGICAL DOMAIN:

**A KABC-II example**

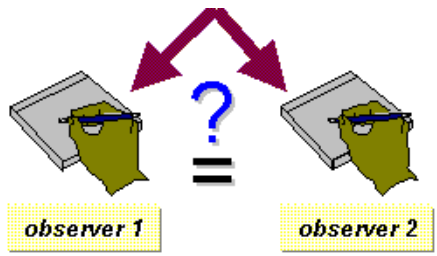
| Battery | Subtest | Attention | Sensory-Motor | Auditory-Verbal | Language Receptive | Language Expressive | Executive Functions | Speed and Efficiency | Visual-Spatial | Memory and Learning |
|---|---|---|---|---|---|---|---|---|---|---|
| Kaufman Assessment Battery for Children-Second Edition | Atlantis | | | | | | ✔ | | ✔ | • |
| | Atlantis Delayed | | | | | | ✔ | | ✔ | • |
| | Block Counting | | | | | | | | • | |
| | Conceptual Thinking | | | | | | ✔ | | ✔ | |
| | Expressive Vocabulary | | | ✔ | | • | | | | ✔ |
| | Face Recognition | ✔ | | | | | | | ✔ | • |
| | Gestalt Closure | | | | | | | | • | ✔ |
| | Hand Movements | ✔ | • | | | | | | ✔ | ✔ |
| | Number Recall | ✔ | | ✔ | | | | | | • |
| | Pattern Reasoning | | | | | | • | | ✔ | |
| | Rebus | | | ✔ | | | ✔ | | | • |
| | Rebus Delayed | | | ✔ | | | ✔ | | | • |
| | Riddles | | | ✔ | ✔ | ✔ | ✔ | | | • |
| | Rover | | | | | | • | | ✔ | |
| | Story Completion | | | | | | • | | ✔ | ✔ |
| | Triangles | | ✔ | | | | ✔ | | • | |
| | Verbal Knowledge | | | ✔ | ✔ | | | | | • |
| | Word Order | • | | ✔ | | | ✔ | | | • |

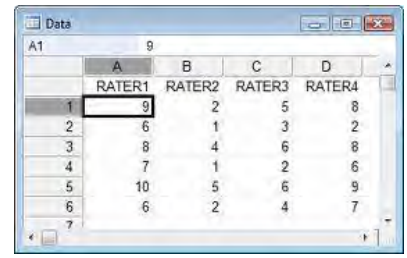
*Note:* A check mark (✔) indicates the authors' classifications. A bullet (•) indicates the authors' classification and Miller's (in press) primary neuropsychological domain classification.

## *Rapid Reference 1.2*

*What's New to This Edition?*

- Inclusion of inter-rater reliability statistics supporting the CHC theory classifications for the majority of new tests.



## Rapid Reference 1.2

*What's New to This Edition?*

- Classification of all achievement, speech/language, phonological, and orthographic processing tests according to the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) area of specific learning disability (e.g., reading decoding tests were classified as tests of Basic Reading Skill; math reasoning tests were classified as tests of Math Problem Solving).

## New Features in XBA3

- Compares all achievement tests with regard to the nature of their task demands and task characteristics

Achievement Appendix Prepared by Jennifer T. Mascolo

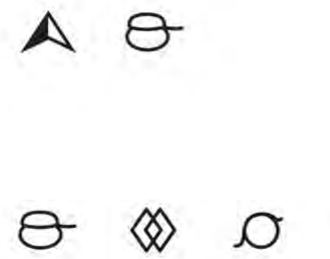
**Reading Comprehension Subtests**

| Battery / Subtest | Cloze Format | Open-Ended Questions | Multiple Choice | Literal Questions | Inferential Questions | Silent Reading | Oral Reading | Examinee Reads | Examinee Reads | Examinee Reads | Time Limit | Examinee reads similar basis as test |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Diagnostic Assessment Battery-Third Edition (DAB-3)** | | ✓ | | ✓ | ✓ | ✓ | | | | ✓ | | |
| Reading Comprehension | | | | | | | | | | | | |
| **Gray Diagnostic Reading Test-Second Edition (GDRT-2)** | | | | | | | | | | | | |
| Meaningful Reading | ✓ | | | | | ✓ | | | ✓ | | | |
| Reading Vocabulary | | | ✓ | | | ✓ | | | ✓ | | | |
| **Gray Oral Reading Test-Fifth Edition (GORT-5)** | | | | | | | | | | | | |
| Reading Comprehension | | | ✓ | ✓ | ✓ | | | | | | | |
| **Illinois Test of Psycholinguistic Abilities-Third Edition (ITPA-3)** | | | | | | | | | | | | |
| Sentence Sequencing | | | ✓ | | | ✓ | | | ✓ | | | ✓ |
| **Kaufman Tests of Educational Achievement-Second Edition (KTEA-II)** | | | | | | | | | | | | |
| Reading Comprehension | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| **Oral and Written Language Scales-Second Edition (OWLS-II)** | | | | | | | | | | | | |
| Reading Comprehension | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| **Phonics Based Reading Test (PRT)** | | | | | | | | | | | | |
| Comprehension | | ✓ | | ✓ | | | ✓ | | | ✓ | | |
| **Quick Picture Reading Test** | | | | | | | | | | | | |
| Quick Picture Reading Test | | | ✓ | | | ✓ | | | ✓ | | | |
| **Test of Early Reading Ability-Third Edition (TERA-3)** | | | | | | | | | | | | |
| Meaning | ✓ | ✓ | ✓ | ✓ | ✓ | | ✓ | | | ✓ | | |
| **Test of Reading Comprehension-Fourth Edition (TORC-4)** | | | | | | | | | | | | |
| Paragraph Construction | | | ✓ | ✓ | | ✓ | | | ✓ | | | ✓ |
| Relational Vocabulary | | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| Sentence Completion | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| Text Comprehension | | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | | ✓ |
| **Wechsler Fundamental Academic Skills (WFAS)** | | | | | | | | | | | | |
| **Reading Comprehension (Forms A & B) Grades K – 1** | | | ✓ | ✓ | ✓ | ✓ | | | | ✓ | ✓ | |
| **Wechsler Individual Achievement Test-Third Edition (WIAT-III)** | | | | | | | | | | | | |
| Reading Comprehension | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| **Wide Range Achievement Test-Expanded (WRAT-Expanded)** | | | | | | | | | | | | |
| Reading | | ✓ | | ✓ | ✓ | ✓ | | | ✓ | | | |
| **Woodcock Johnson Third Edition Normative Update Tests of Achievement (WJ III NU ACH)** | | | | | | | | | | | | |
| Passage Comprehension | ✓ | | | | | ✓ | | | ✓ | | | ✓ |
| Reading Vocabulary | | | | ✓ | ✓ | | | | ✓ | | | |
| **Woodcock Johnson Third Edition Normative Update Tests of Achievement (WJ III NU ACH), Form C** | | | | | | | | | | | | |
| Passage Comprehension | ✓ | | | | | ✓ | | | ✓ | | | ✓ |
| **Woodcock Johnson Third Edition Normative Update Diagnostic Reading Battery (WJ III NU DRB)** | | | | | | | | | | | | |
| **Passage Comprehension** | ✓ | | | | | ✓ | | | ✓ | | | ✓ |

## Rapid Reference 1.2

*What's New to This Edition?*

- Inclusion of variation in task task demands and characteristics of cognitive, achievement, and neuropsychological batteries—information important for conducting a demand analysis of test performance



**Compares all cognitive and neuropsychological tests with regard to the nature of their task demands and task characteristics: A KABC-II example**

**Appendix E.**
**Variation in Task Characteristics of Subtests on Cognitive and Neuropsychological Batteries for Glr - Long-Term Storage and Retrieval**

| | KABC-II Atlantis | KABC-II Atlantis Delayed | KABC-II Rebus | KABC-II Rebus Delayed | NEPSY-II Memory For Names | TOMAL-2 Paired Recall | WJ III NU CDG Delayed Recall: Visual-Auditory Learning | WJ III NU CDG Visual-Auditory Learning | WJ III NU DS Delayed Recall: Memory for Names | WJ III NU DS Memory for Names | WISC-IV Integrated Coding Recall (Gv-MV) | WMS-IV Verbal Paired Associates | WMS-IV Verbal Paired | WRAML2 Sto | WR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Associative Memory (MA) | | | | | | | | | | | | | | |
| **Test Characteristic/Demand** | Age in Years | | | | | | | | | | | | | | |
| | 3-18 | 5-18 | 4-18 | 5-18 | 5-16 | 5-59 | 4-90+ | 2-90+ | 4-90+ | 2-90+ | 6-16 | 16-90 | 16-90 | 5-8 | 5-8 |
| Auditory Stimulus - Audio-recorded | | | | | | | | | | | | | | | |
| Auditory Stimulus - Examiner-spoken | ✓ | ✓ | ✓ | | ✓ | ✓ | | ✓ | ✓ | ✓ | | ✓ | ✓ | ✓ | |
| Auditory Stimulus - Musical | | | | | | | | | | | | | | | |
| Auditory Stimulus - Tone | | | | | | | | | | | | | | | |
| Auditory Stimulus - Verbal (brief, 1 word or less) | ✓ | ✓ | ✓ | | | | | ✓ | ✓ | ✓ | | | ✓ | ✓ | |
| Auditory Stimulus - Verbal (lengthy, over 1 word) | | | | | ✓ | ✓ | | | | | | ✓ | ✓ | | |
| Tactile Stimulus | | | | | | | | | | | | | | | |
| Background Noise | | | | | | | | | | | | | | | |
| General Querying/Prompting allowed | | | | | | | | | | ✓ | | | | | |
| Instructions - Demonstration/Modeling | | | | | | | | ✓ | | | | | | | |
| Instructions -Gesture/Pantomime Required | | | | | | | ✓ | ✓ | | | | | | | |
| Item Feedback - Early or Selected Items Only | | | | | | | | | | | | | | | |
| Item Feedback when Correct | ✓ | | ✓ | | | ✓ | | | | | | ✓ | | | |
| Item Feedback when Incorrect | ✓ | | ✓ | | ✓ | ✓ | ✓ | ✓ | | ✓ | | ✓ | | ✓ | |

**Appendix prepared by Marlene Sotelo-Dynega and Tara Culsky and included in Flanagan, D. P., Ortiz, S. O. and Alfonso, V. C. (2013).** ***Essentials of Cross-Battery Assessment, 3rd edition. Hoboken, NJ: Wiley***

## Rapid Reference 1.2

*What's New to This Edition?*

- Calculation of all cross-battery clusters in a psychometrically defensible way using median estimates of subtest reliabilities and intercorrelations.

Median Reliability Coefficients Used in Formulae to Calculate XBA Composites

| Broad Ability Domain | Number of Coefficients | Number of Narrow Abilities Represented | Median |
|---|---|---|---|
| *Gc* | 49 | 6 | .88 |
| *Gf* | 29 | 3 | .89 |
| *Glr* | | | .81 |
| *Gsm* | | | .87 |
| *Gv* | | | .82 |
| *Ga* | | | .89 |
| *Gs* | | | .84 |
| *Gq* | | | .93 |
| *Grw-R* | 10 | 3 | .94 |
| *Grw-W* | 12 | 4 | .87 |
| | | | |
| TOTAL | 221 | 40 | |

**Over 1750 Coefficients Gathered to Program the DMIA v2.0 and PSW-A v1.0**

***Note*: The median values in this table were used in formulae to calculate CHC broad and narrow ability composites on the CHC Analyzer tab of the DMIA v2.0.**

**KABC-II Tab of XBA DMIA**

| Name of Index *(check box to graph)* / Name of Subtest *(check box to graph)* | | Enter scores below | PR | Transfer to CHC tab |
|---|---|---|---|---|
| **Sequential/Gsm** | ☐ | 97 | 42 | |
| Number Recall | ☐ | 9 | 37 | ☑ |
| Word Order | ☐ | 10 | 50 | ☑ |
| (Hand Movements) | ☐ | | | ☐ |

**Estimate of Memory Span only**

**KABC-II Data Automatically Transferred to CHC Analyzer**

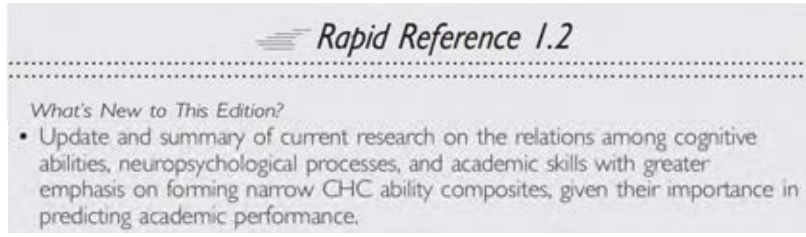
| SHORT-TERM MEMORY (*Gsm*) | Enter scores below | Converted Standard Score | |
|---|---|---|---|
| KABC-II Number Recall (Gsm:MS) | 9 | 95 | A |
| KABC-II Word Order (Gsm:MS,MW) | 10 | 100 | A |
| | | | |
| | | | |

| | Comp A | Comp B |
|---|---|---|
| Clear Gsm Data — Composite Standard Score(s): | 97 | |
| Composite Percentile Rank(s): | 42 | |

**KABC-II/DAS-II Cross-Battery Data Analyzed**

| SHORT-TERM MEMORY (*Gsm*) | Enter scores below | Converted Standard Score | |
|---|---|---|---|
| KABC-II Number Recall (Gsm:MS) | 9 | 95 | A |
| KABC-II Word Order (Gsm:MS,MW) | 10 | 100 | A |
| DAS-II Recall of Sequential Order (Gsm:MW) | 102 | 102 | A |
| | | | |

| | Comp A | Comp B |
|---|---|---|
| Clear Gsm Data — Composite Standard Score(s): | 99 | |
| Composite Percentile Rank(s): | 47 | |




| CHC Ability | Reading Achievement | Math Achievement | Writing Achievement |
|---|---|---|---|
| *Gf* | Inductive (I) and general sequential (deductive) reasoning (RG) abilities play a moderate role in reading comprehension. | **Inductive (I) and general sequential (RG) reasoning abilities are consistently very important at all ages.** | Inductive (I) and general sequential reasoning abilities are related to basic writing skills primarily during the elementary school years (e.g., 6 to 13) and consistently related to written expression at all ages. |

Table 3. *Narrow Abilities Related to Reading Achievement Measured by Popular Batteries*

| Diagnostic Reading Cross-Battery | | | | |
|---|---|---|---|---|
| **Relevant Broad CHC Ability and Neuropsychological Domain** | **Relevant Narrow CHC Ability and Neuropsychological Process** | **Most Relevant WISC-IV and WIAT-III Subtests** | **Most Relevant WJ III COG and ACH Subtests** | **Most Relevant NEPSY-II Subtests** |
| Gf - Fluid Reasoning | I - Induction | **Matrix Reasoning** | **Concept Formation** | **Animal Sorting** |
| | RG - Gen Seq Reasoning | | **Analysis-Synthesis** | |
| Gc - Comprehension-Knowledge | LS - Listening Ability | **WIAT-III Listening Comprehension** | **WJ III NU ACH Oral Comprehension** | **Comprehension of Instructions** |
| *Note: All Gc narrow abilities involve LD or Language Development* | KO - General Information | **Information** | **General Information** | **Body Part Naming and Identification** |
| | VL - Lexical Knowledge | **Vocabulary** | **Verbal Comprehension** | |
| Gsm -Short-term Memory | MS - Memory Span | **Digit Span - Forward** | **Memory for Words** | **List Memory** |
| | MW - Working Memory Capacity | **Letter-Number Sequencing** | **Auditory Working Memory** | **Auditory Attention and Response Set** |
| Gv -Visual Processing | MV - Visual Memory | | **Picture Recognition** | **Memory for Designs** |
| | Orthographic Processing | | | |
| Ga - Auditory Processing | PC - Phonetic Coding | **WIAT-III Early Reading Skills** | **Incomplete Words** | **Phonological Processing** |
| | US - Speech-Sound Discrimination | | | |
| Glr - Long-term Storage and Retrieval | NA - Naming Facility (Rapid Naming) | | **Rapid Picture Naming** | **Speeded Naming** |
| | MA - Associative Memory | | **Visual Auditory Learning** | **Memory for Names** |
| | M6 - Free Recall Memory | | | **List Memory Delayed** |
| | MM - Meaningful Memory | | **WJ III NU ACH Story Recall** | **Narrative Memory** |
| Gs - Processing Speed | RS - Reading Speed (with full comp) | **WIAT-III Oral Reading Fluency** | **WJ III NUACH Reading Fluency** | |
| | P - Perceptual Speed | **Symbol Search** | **Visual Matching** | |
| Attention | Selective; Focused; Sustained | **Cancellation** | **Consider Broad Attention Clinical Cluster** | **Auditory Attention and Response Set** |
| Executive Function | Consider Cascading Production Decrements/Increments Model (McCloskey et al., 2009) | | **Consider Executive Processes Clinical Cluster** | **Word Generation** |

## Rapid Reference 2.6. WISC-IV/WIAT-III-based Diagnostic Reading Cross-Battery

| Relevant Broad CHC Ability and Neuropsychological Domain | Relevant Narrow CHC Ability and Neuropsychological Process | Most Relevant WISC-IV and WIAT-III Subtests | Supplemental Subtests for Generating Narrow Ability and Processing Composites and Testing Hypotheses |
|---|---|---|---|
| Gf - Fluid Reasoning | I - Induction | **Matrix Reasoning** | **Picture Concepts; check manifestation of Gf weakness with WIAT-III Reading Comprehension (literal v. inferential)** |
| | RG - General Sequential Reasoning (Deduction) | | WJ III/NU COG Analysis Synthesis |
| Gc - Comprehension-Knowledge | LS - Listening Ability | **WIAT-III Listening Comprehension** | WJ III/NU ACH Oral Compreshension |
| *Note: All Gc narrow abilities involve LD or Language Development* | K0 - General Information | **Information** | **Comprehension** |
| | VL - Lexical Knowledge | **Vocabulary** | **Similarities; Word Reasoning** |
| Gsm -Short-term Memory | MS - Memory Span | **Digit Span - Forward** | WJ III/NU COG Memory for Words |
| | MW - Working Memory Capacity | **Letter-Number Sequencing** | **Digit Span-Backward**; See Appendix B (e.g., DAS-II Recall of Sequential Order) |
| Gv -Visual Processing | MV - Visual Memory | | WJ III/NU COG Picture Recognition |
| | Orthographic Processing | | Examples: Subtests from the Test of Orthographic Competence or Early Reading Assessment |
| Ga - Auditory Processing | PC - Phonetic Coding | **WIAT-III Early Reading Skills** | WJ III/NU COG Sound Blending |
| | US - Speech-Sound Discrimination | | WJ III/NU DS Sound Patterns-Music; Sound Patterns-Voice |
| Glr - Long-term Storage and Retrieval | NA - Naming Facility (Rapid Naming) | | WJ III/NU COG Rapid Picture Naming; See Appenidx B (e.g., D-KEFS Verbal Fluency; NEPSY-II Speeded Naming) |
| | MA - Associative Memory | | WJ III/NU COG Visual-Auditory Learning; WJ III/NU DS Memory for Names |
| | M6 - Free Recall Memory | | see Appendix B (e.g., NEPSY-II List Memory; DAS-II Recall of Objects) |
| | MM - Meaningful Memory | | WJ III/NU ACH Story Recall |

**Flanagan et al. (2013) Essentials of Cross-Battery Assessment, 3rd Ed. Hoboken, NJ: Wiley**

## Rapid Reference 2.6. WISC-IV/WIAT-III-based Diagnostic Reading Cross-Battery

| Relevant Broad CHC Ability and Neuropsychological Domain | Relevant Narrow CHC Ability and Neuropsychological Process | Most Relevant WISC-IV and WIAT-III Subtests | Supplemental Subtests for Generating Narrow Ability and Processing Composites and Testing Hypotheses |
|---|---|---|---|
| Gs - Processing Speed | RS - Reading Speed (with full comprehension) | **WIAT-III Oral Reading Fluency** | Check manifestation of Gs weakness with WIAT-III Reading Fluency, Accuracy and Rate; WJ III/NU ACH Reading Fluency |
| | P - Perceptual Speed | **Symbol Search** | **Cancellation** |
| Attention | | | WJ III NU COG Attention Clinical Cluster; Other Examples: NEPSY-II Auditory Attention and Response Set; Conners 3; |
| Executive Function | | | WJ III NU COG Executive Processing Clinical Cluster; Other Examples: D-KEFS Inhibition/switching; NEPSY-II Animal Sorting, Inhibition; BRIEF (See EF domain on CHC Tab of DMIA) |

**Flanagan et al. (2013) Essentials of Cross-Battery Assessment, 3rd Ed. Hoboken, NJ: Wiley**

# Individual Differences are Important

***Differential Diagnosis***

Intellectual Disability, General Learning Difficulty (Slow Learner), and Specific Learning Disability

## Differential Diagnosis: Cognitive Ability and Adaptive Behavior

| *Intellectual Disability (ID)* | *General Learning Difficulty (Slow Learner)* | *Specific Learning Disability (SLD)* |
|---|---|---|
| General ability ≤ 70-75 | General ability > 75 and ≤ 89 | General ability ≥ 90 |
| Little variation in cognitive ability and processing profile | Little to moderate variation in cognitive ability and processing profile | Moderate to high (or statistically significant) variation in cognitive ability and processing profile |
| All or nearly all cognitive areas ≤ 75 | May have normative deficits in one or more cognitive and academic areas (≤ 85) | Normative deficits (≤ 85) in specific cognitive abilities and processes; Normative deficits (≤ 85) in specific academic area(s); Empirical or ecologically valid relationship between cognitive and academic deficits |
| *Possible relative* strengths in one or more processes or abilities that are not highly *g* saturated, such as *Ga* (e.g., phonemic awareness) and *Gs* (e.g., simple clerical-type tasks) | May have *relative* strengths in one or more processes or abilities | Intact functioning (≥ 90 and ≤ 115) in many processes and abilities and *possible normative* cognitive or academic strengths (> 115) |
| Deficits (≤ 75) in Adaptive Behavior; little variation in performance across adaptive behavior domains | May have one or more deficits in Adaptive Behavior (but not in all domains) | Minimal to no deficits in Adaptive Behavior |

# Differential Diagnosis: Response to Instruction/Intervention and Programming

| *Intellectual Disability (ID)* | *General Learning Difficulty (Slow Learner)* | *Specific Learning Disability (SLD)* |
|---|---|---|
| Progress Monitoring (or other performance indicators) demonstrates very slow rate of response/learning; will not meet typical grade level benchmarks in any academic area | Progress Monitoring (or other performance indicators) demonstrates slow rate of response/learning; may meet typical grade level benchmarks in some, but not all, academic areas | Following a comprehensive evaluation and resultant provisions of tailored interventions, accommodations, compensatory strategies, and/or modifications, Progress Monitoring (or other performance indicators) demonstrates rate of response/learning similar to same grade peers; may approximate or meet typical grade level benchmarks |
| Special Education | Tier II and Tier III interventions in General Education; Remedial Programs; 504 | Special Education; Remedial Programs; Inclusion (Tier II and Tier III interventions) |
| *Primary Foci*: Self-Help Skills; Functional Academics; Social Skills | *Primary Foci*: Functional Academics; Vocational Training; Accommodations; Compensatory Strategies; Social Skills and Self-Esteem | *Primary Foci*: Grade Level Performance; College Preparation; Accommodations; Compensatory Strategies; Self-Esteem; Self-Advocacy |
| Use data from strength-based assessment for intervention planning | Use data from strength-based assessment for intervention planning | Use data from strength-based assessment for intervention planning |

## Don't Forget

- Differential Diagnosis is Important

A diagnosis identifies the nature of a specific learning disability and has implications for its probable etiology, instructional requirements, and prognosis. Ironically, in an era when educational practitioners are encouraged to use evidence-based instructional practices, they are not encouraged to use evidence-based differential diagnoses of specific learning disabilities.

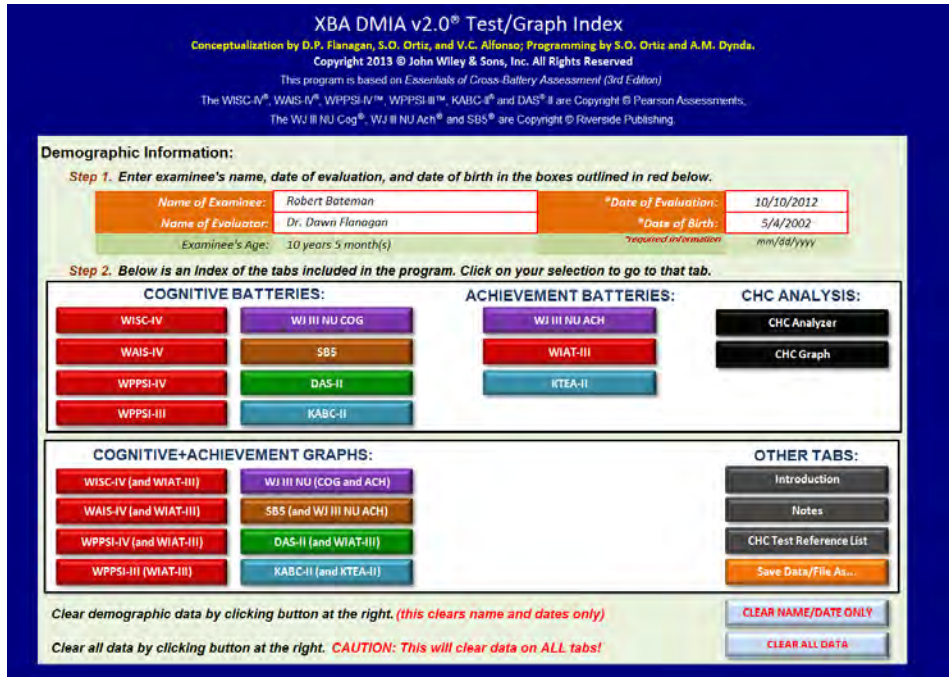
**Virginia Berninger (2011). Chapter in Flanagan & Alfonso (Eds.), *Essentials of Specific Learning Disability Identification*. Wiley.**

## Rapid Reference 1.2

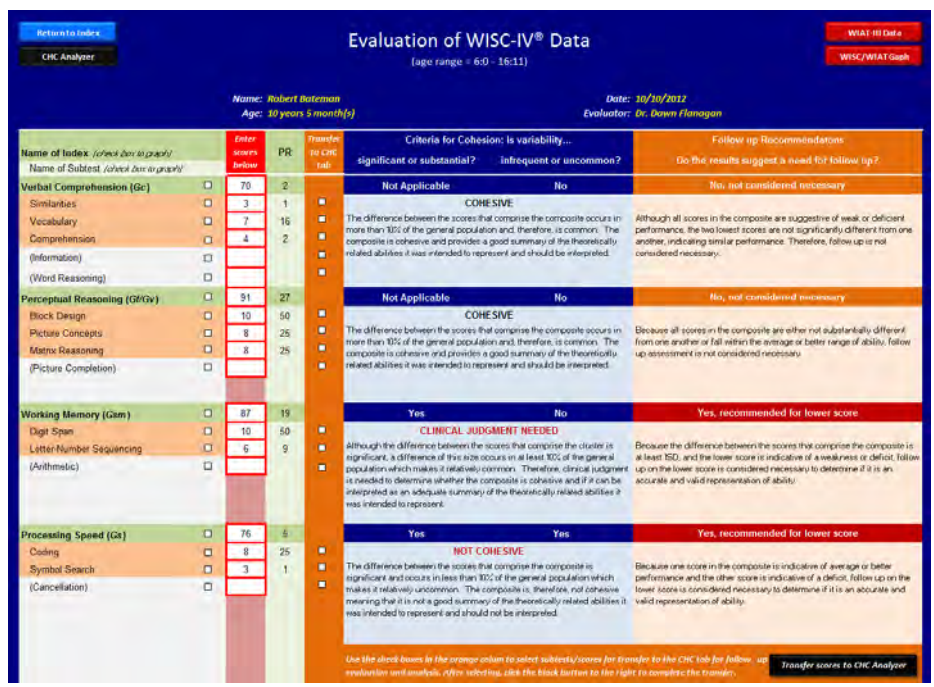
*What's New to This Edition?*

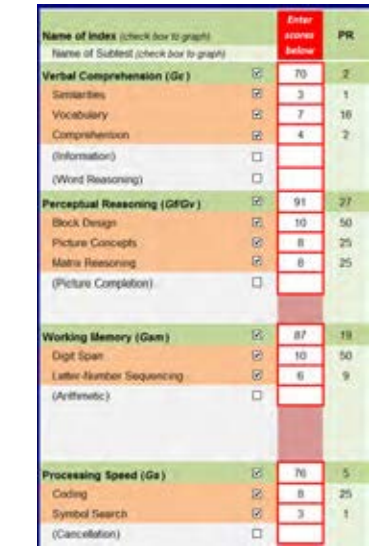
- Extensive revision of the XBA DMIA with significantly increased functionality, easier navigation, interpretive statements, and enhanced graphing capabilities (see Rapid Reference 2.4 in Chapter 2 for details).

## The New Data Management and Interpretive Assistant




Interpretive Statements are Available on Each Test Tab

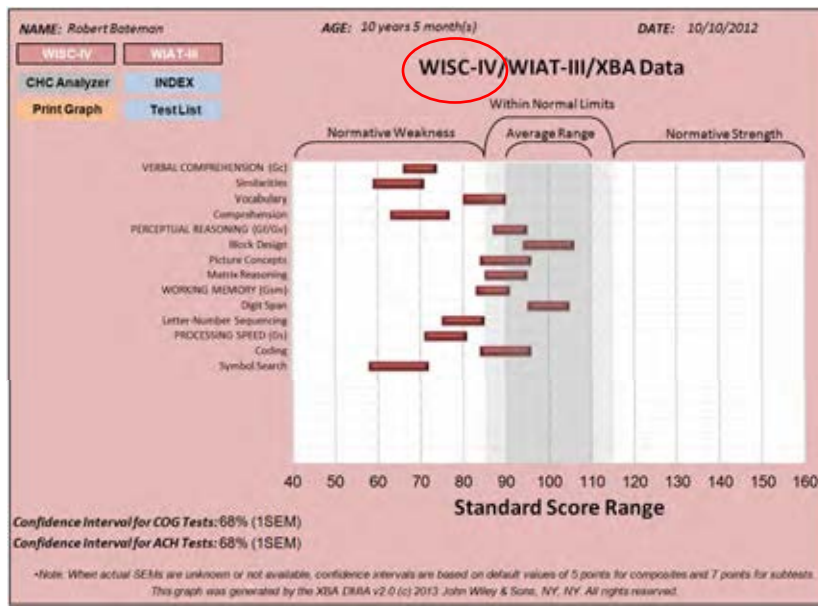




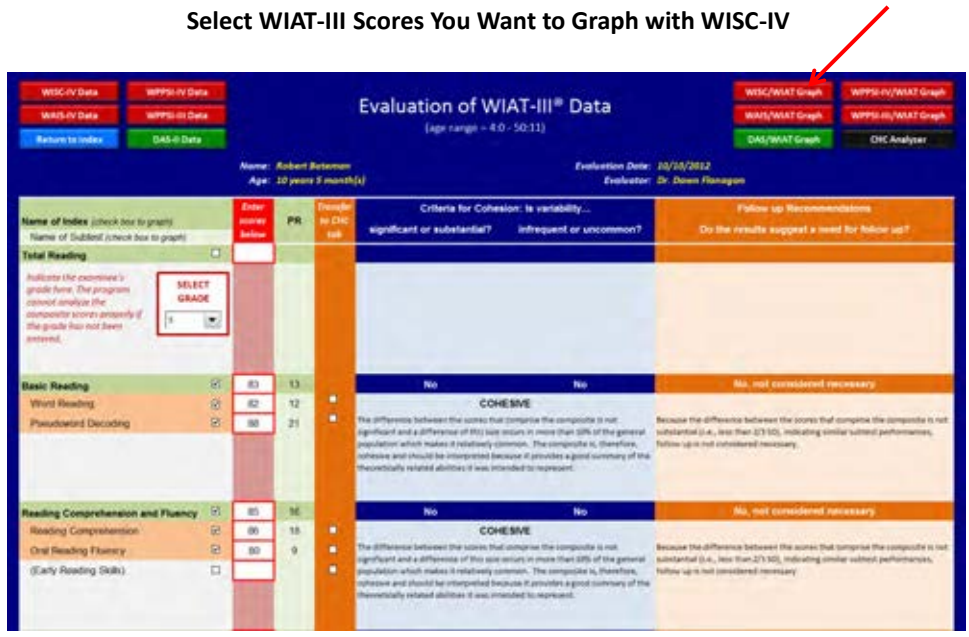

# Graphing Options Available

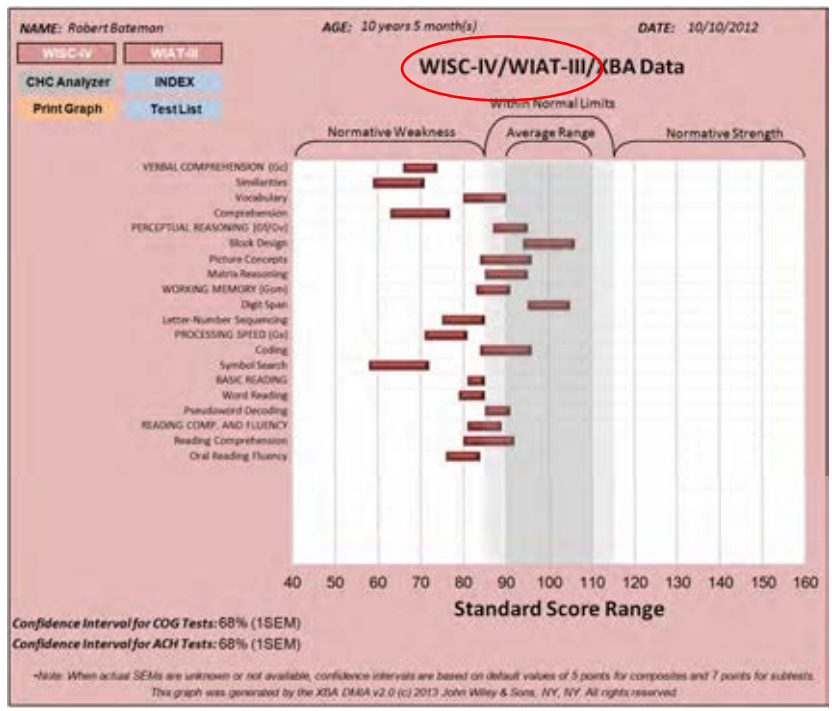
**Check boxes by hand;**
**"Select All"**

**Select Desired CI**

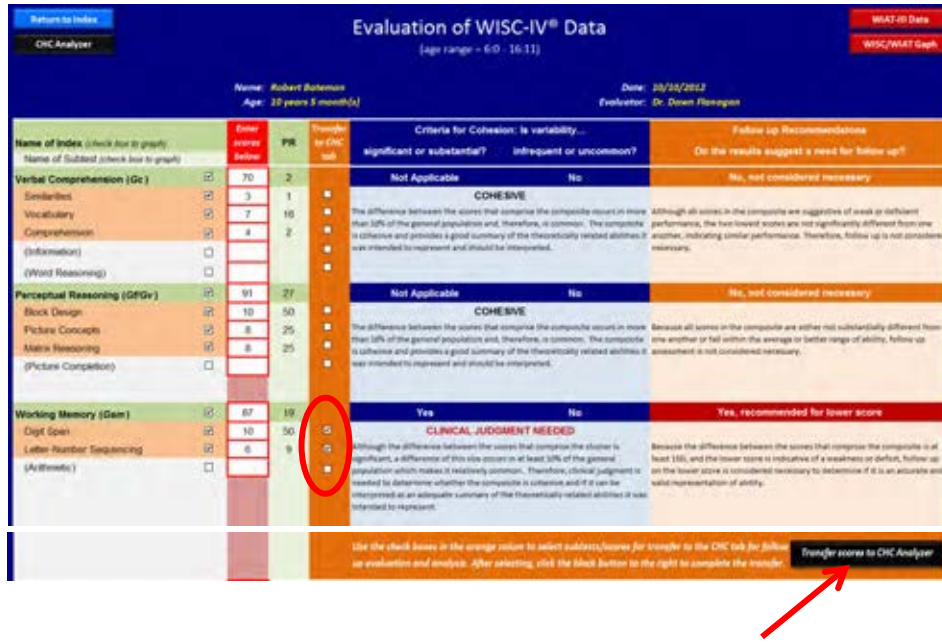


**Select WIAT-III Scores You Want to Graph with WISC-IV**

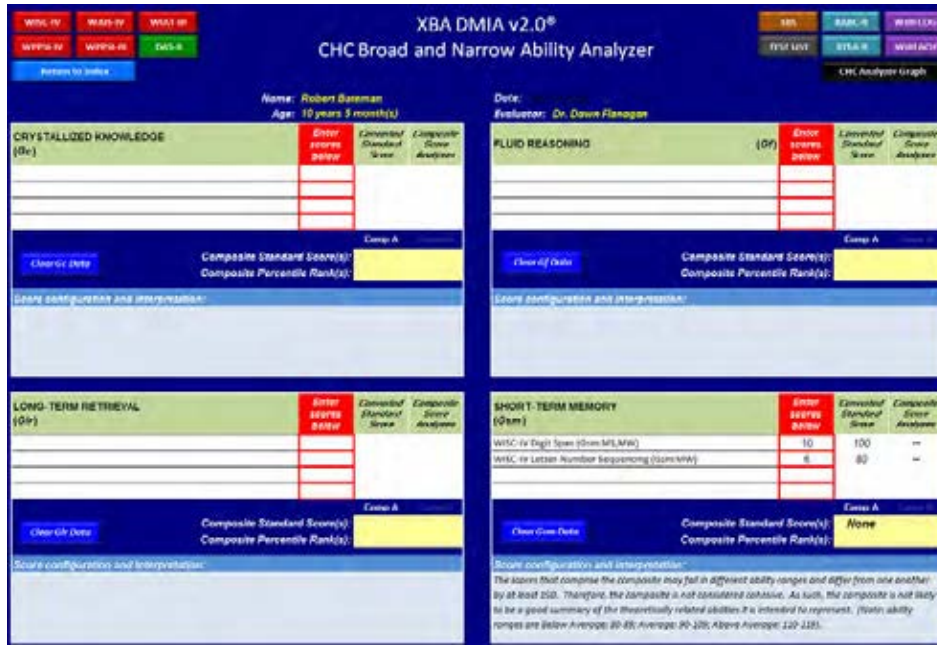


## Transfer Data for Follow Up




## New CHC Analyzer Tab



# CHC Analyzer Tab – *Gsm* Example

| SHORT-TERM MEMORY (*Gsm*) | Enter scores below | Converted Standard Score | Composite Score Analyses |
|---|---|---|---|
| WISC-IV Digit Span (Gsm:MS,MW) | 10 | 100 | B |
| WISC-IV Letter-Number Sequencing (Gsm:MW) | 6 | 80 | A |
| DAS-II Recall of Digits-Forward (Gsm:MS) | 103 | 103 | B |
| DAS-II Recall of Digits-Backward (Gsm:MW) | 72 | 72 | A |

Clear Gsm Data

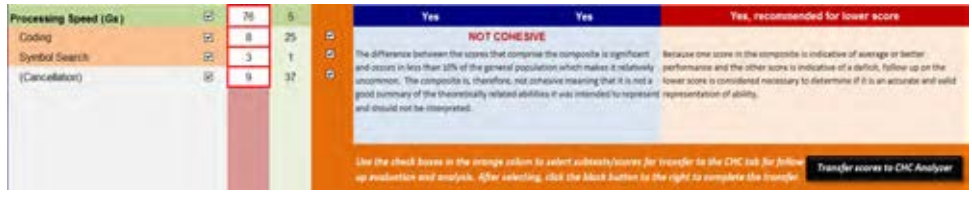
| | Comp A | Comp B |
|---|---|---|
| Composite Standard Score(s): | 72 | 102 |
| Composite Percentile Rank(s): | 3 | 55 |

*Score configuration and interpretation:*

*Because the difference between the highest and lowest scores entered is greater than 1 and 1/3 SD, this set of scores is not considered cohesive, indicating that a composite based on all four scores is unlikely to provide a good summary of the ability it is intended to represent. Instead, the two lowest scores form one cohesive composite that may be interpreted meaningfully and the two highest scores also form another cohesive composite that may be interpreted meaningfully.*

| *Note: If you have subtests that are based on T-Scores, you can convert them to Standard Scores (in the Deviation IQ metric) using the score converter here: | 52 | <--T-Score here is equal to Standard Score here--> | 103 | <-- Enter/Use this score |
|---|---|---|---|---|
| *Note: If you have subtests that are based on T-Scores, you can convert them to Standard Scores (in the Deviation IQ metric) using the score converter here: | 31 | <--T-Score here is equal to Standard Score here--> | 72 | <-- Enter/Use this score |

## Analysis of *Gs* Subtests from WISC-IV




| PROCESSING SPEED (Gs) | Enter scores below | Converted Standard Score | Composite Score Analyses |
|---|---|---|---|
| WISC-IV Coding (Gs:R9) | 8 | 90 | A |
| WISC-IV Symbol Search (Gs:P) | 3 | 65 | divergent |
| WISC-IV Cancellation (Gs:P) | 9 | 95 | A |

Clear Gs Data

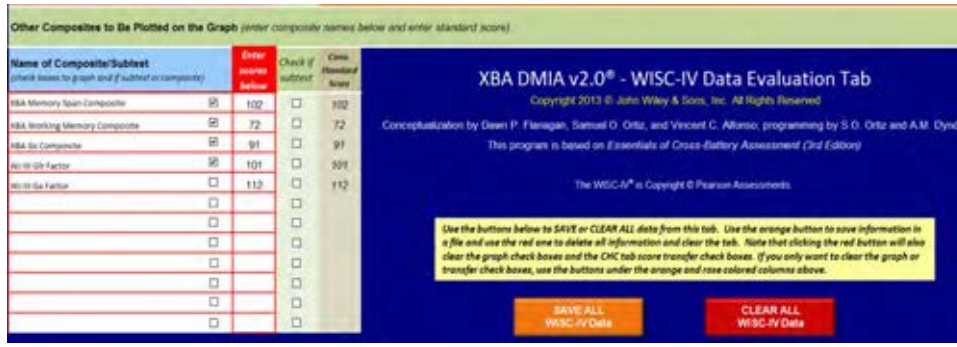
| | Comp A |
|---|---|
| Composite Standard Score(s): | 91 |
| Composite Percentile Rank(s): | 28 |

*Score configuration and interpretation:*

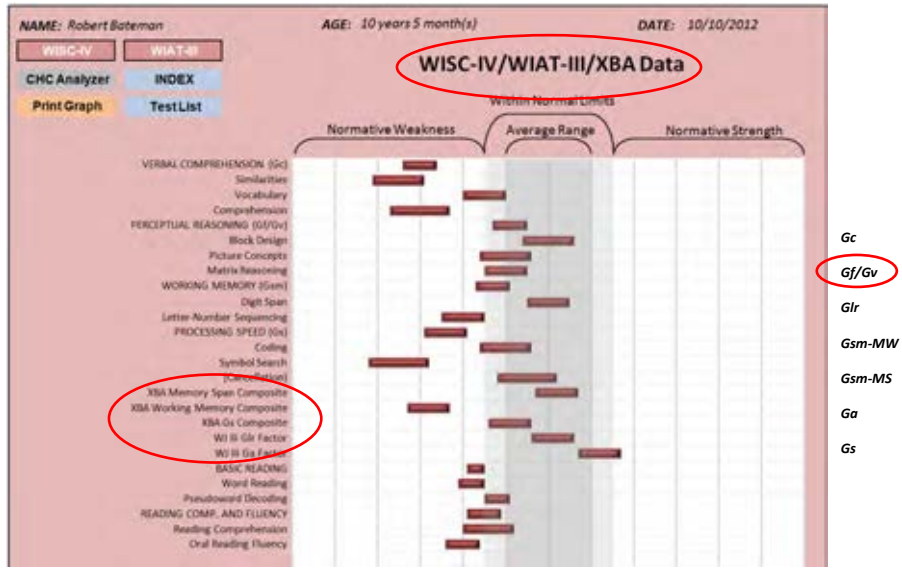
*Because the difference between the highest and lowest scores entered is greater than or equal to 1SD, this set of scores is not cohesive, indicating that a composite based on all three scores is unlikely to provide a good summary of the ability it is intended to represent. Instead the two highest scores form a cohesive composite that may be interpreted meaningfully and the lowest value is a divergent score.*

**Enter XBA Composites on Bottom of Test Tab – *WISC-IV Tab Example***

**Enter Data From Supplemental Tests as Necessary**



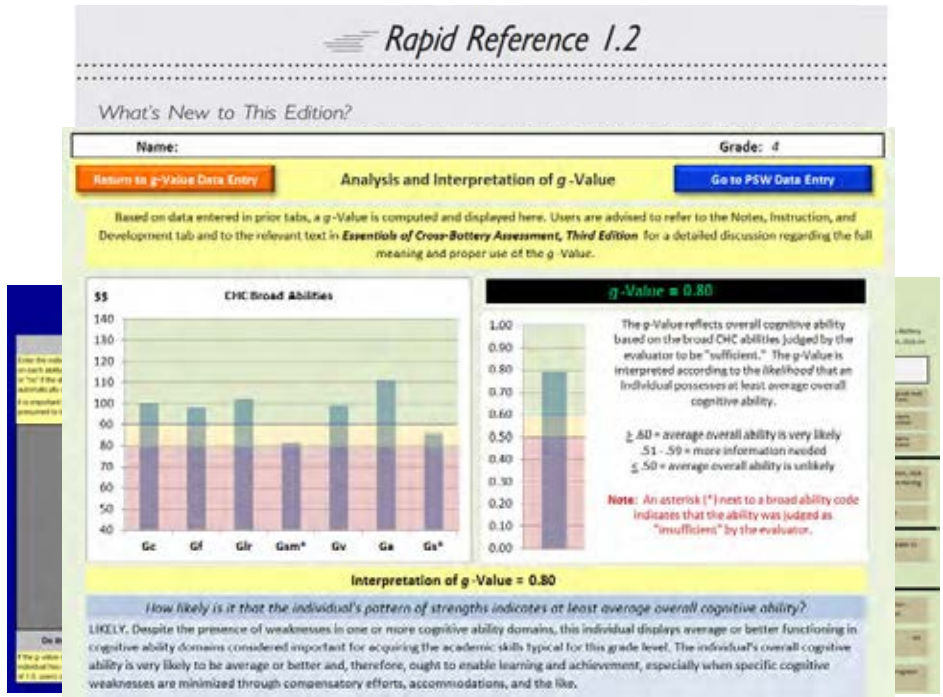

**Results of a Comprehensive Evaluation of Cognitive and Academic Abilities**




**Is Robert's Pattern of Strengths and Weaknesses Consistent with SLD?**

**WISC-IV PRI is Cohesive; No Follow Up Necessary**


**Give PC and Obtain Clinical Clusters for *Gf* and *Gv* if Using PSW-A**

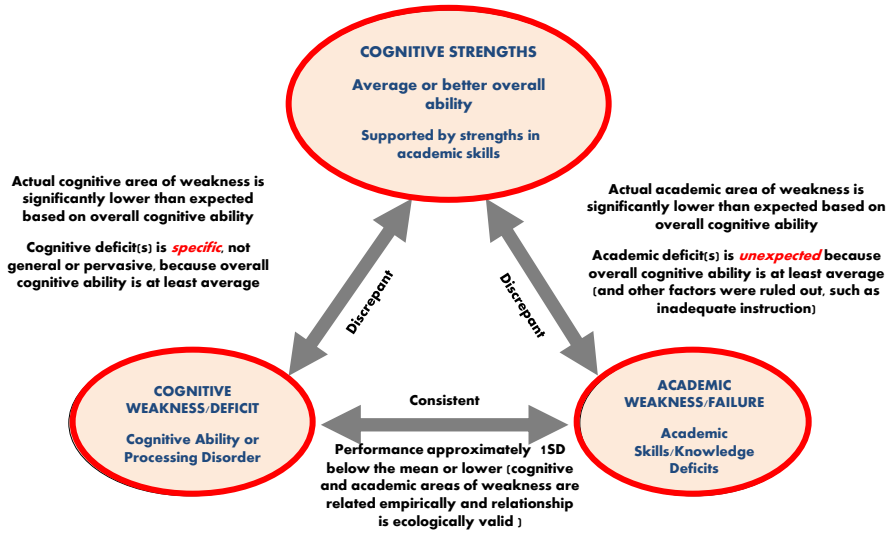
## An Operational Definition of SLD
## Flanagan, Ortiz, Alfonso, and Mascolo

- Definition first presented in 2002
- Revised and updated in 2006
- Updated in 2007
- Revised and updated in 2011
- Updated and Renamed in 3e of Essentials of XBA3 in 2013 - ***Dual Discrepancy/Consistency Operational Definition***


Third Method Approaches

Multiple Methods/Multiple Data Sources

## Conceptual Similarities Among Alternative Research-based Approach to SLD




**Flanagan, Alfonso, & Mascolo (2011); Flanagan, Fiorello, & Ortiz (2010); Hale, Flanagan, & Naglieri (2008)**

*Figure 4.2. Flanagan and Colleagues' Dual-Discrepancy/Consistency (DD-C) Operational Definition of SLD*

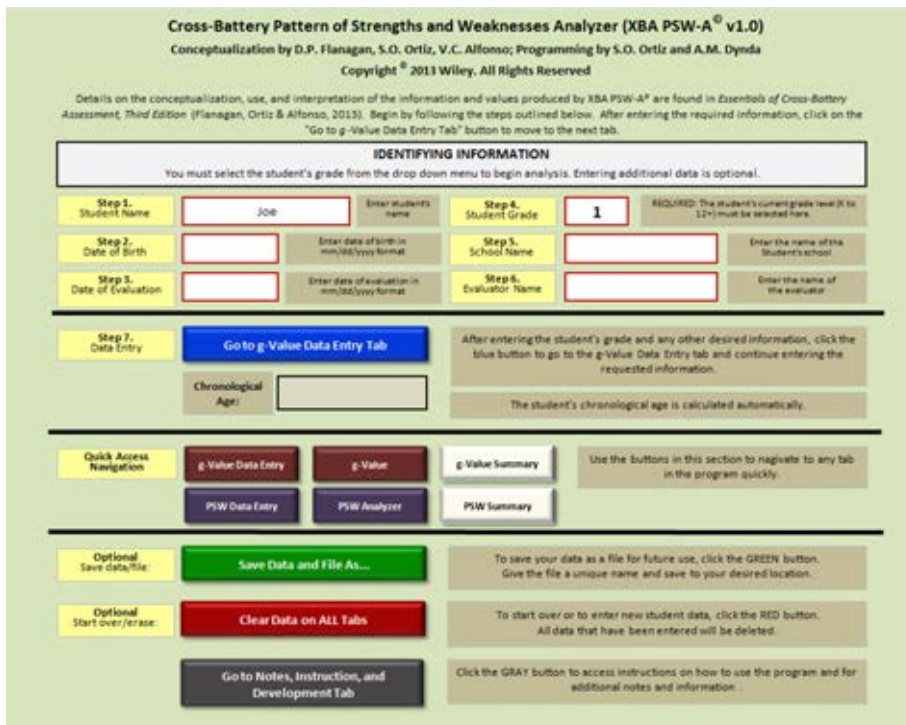
| Level | Nature of SLD[1] | Focus of Evaluation | Examples of Evaluation Methods and Data Sources | Criteria for SLD | SLD Classification and Eligibility |
|---|---|---|---|---|---|
| I | Difficulties in one or more areas of academic achievement, including (but not limited to)[2] Basic Reading Skill, Reading Comprehension, Reading Fluency, Oral Expression, Listening Comprehension, Written Expression, Math Calculation, Math Problem Solving. | **Academic Achievement:** Performance in specific academic skills (e.g., *Grw, Gq, Gc*). | Response to quality instruction and intervention via progress monitoring, **performance on norm-referenced**, standardized achievement tests, evaluation of work samples, **observations of academic** performance, teacher/parent/student interview, history of academic performance, data from other members of Multidisciplinary Team (MDT) (e.g., speech/language pathologist, interventionist, reading specialist). | Performance in one or more academic areas is *weak or deficient*[3] (despite attempts at delivering quality instruction) as evidenced by converging data sources. | Necessary |
| II | SLD does not include a learning problem that is the result of visual, hearing, or **motor disabilities**; of intellectual disability; of social or emotional disturbance; or of environmental, educational, cultural, or economic disadvantage. | **Exclusionary Factors:** Identification of potential primary causes of academic skill weaknesses or deficits, including intellectual disability, cultural or linguistic difference, sensory impairment, insufficient instruction or opportunity to learn, organic or physical health factors, social-emotional or psychological disturbance. | Data from the methods and sources listed at Levels I and III. Behavior Rating Scales; medical records; prior evaluations; interviews with current or past counselors, psychiatrists, etc. | Performance is not *primarily* attributed to these exclusionary factors, although one or more of them may contribute to learning difficulties. [consider using the ***Exclusionary Factors Form*** in Rapid Reference 4.x; this form may be downloaded from the CD that accompanies this book and duplicated for use in practice] | |
| III | A disorder in one or more of the basic psychological/neuropsychological processes involved in understanding or in using language, spoken or written; such disorders are presumed to originate from central nervous system dysfunction. | **Cognitive Abilities & Processes:** Performance in cognitive abilities (e.g., *Gc, Gf, Gv, Ga, Glr, Gsm, Go*), specific neuropsychological processes (e.g., attention, executive functioning, orthographic processing, RAN, RAS) and learning efficiency (e.g., associative memory, free recall memory). | Performance on norm-referenced tests, evaluation of work samples, observations of cognitive performance, task analysis, testing limits, teacher/parent/student interview, history of academic performance, records review. | Performance in one or more cognitive abilities and/or neuropsychological processes (related to academic skill deficiency) is *weak or deficient*[3] as evidenced by converging data sources. | |

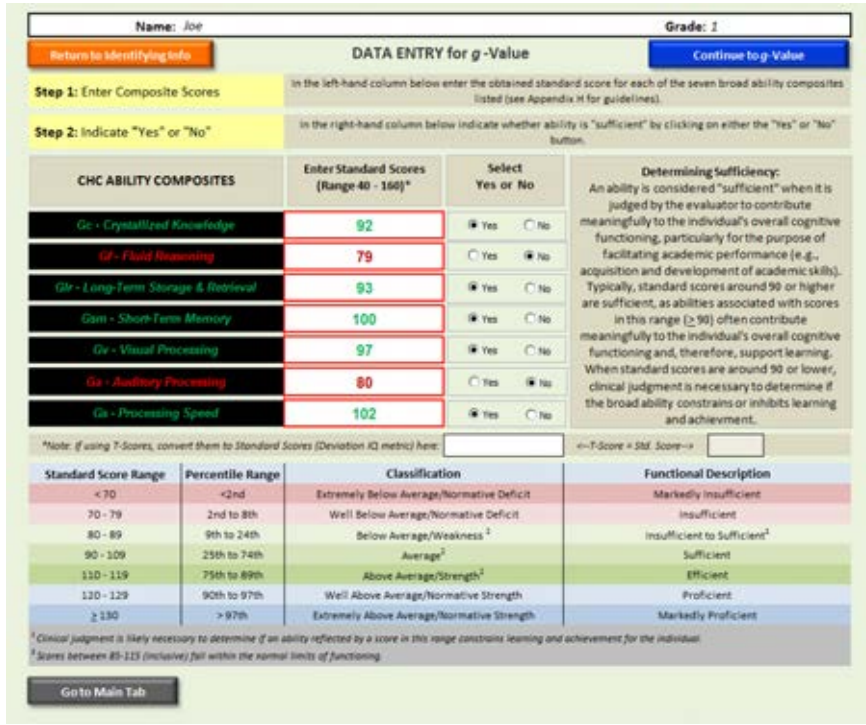
Flanagan, Oritz, & Alfonso (2013). *Essentials of Cross-Battery Assessment, 3rd Edition*. Hoboken, NJ: Wiley.

| | | | | | |
|---|---|---|---|---|---|
| IV | The specific learning disability is a discrete condition differentiated from generalized learning failure by average or better cognitive ability and a learning skill profile exhibiting significant variability indicating processing areas of strength and weakness. | **Pattern of Strengths and Weaknesses Marked by a Dual Discrepancy/Consistency (DD-C)**<br>Determination of whether academic skill weaknesses or deficits are related to specific cognitive area(s) of weakness or deficit; pattern of data reflects a below average aptitude-achievement consistency with otherwise average or better ability to think and reason. | Data gathered at all previous levels as well as any additional data following a review of initial evaluation results (e.g., data gathered for the purpose of hypothesis testing; data gathered via demand analysis and limits testing). | Circumscribed below average aptitude-achievement consistency (i.e., related cognitive processes and academic skills are generally about 1 SD below the mean or lower); circumscribed ability-achievement and ability-cognitive aptitude discrepancies, with cognitive areas of strength represented by standard scores that are generally ≥90; clinical judgment supports the impression that the student's overall ability to think and reason will enable him or her to benefit from tailored or specialized instruction/intervention, compensatory strategies, and accommodations, such that his or her performance rate and level will likely approximate more typically achieving, non-disabled peers. [The ***PSW-A v1.0*** software program on the CD that accompanies this book may be used to determine if the individual has a DD-C pattern of strengths and weaknesses that is consistent with SLD.] | **Sufficient For SLD Identification** |
| V | Specific learning disability has an adverse impact on educational performance. | **Special Education Eligibility**[4]<br>Determination of Least Restrictive Environment (LRE) for delivery of instruction and educational resources. | Data from all previous levels and MDT meeting; including parents. | Student demonstrates significant difficulties in daily academic activities that cannot be remediated, accommodated, or otherwise compensated for without the assistance of individualized special education services. | **Necessary for Special Education Eligibility** |

[1]This column includes concepts inherent in the federal definition (IDEA, 2004), Kavale, Spaulding, and Beam's (2009) definition, Harrison and Holmes' (2012) consensus definition, and other prominent definitions of SLD (see Sotelo-Dynega, Flanagan, & Alfonso, 2011 for a summary). Thus, all prominent SLD markers are included in this column.
[2]Poor spelling with adequate ability to express ideas in writing is often typical of dyslexia and/or dysgraphia. Even though IDEA 2004 includes only the broad category of written expression, poor spelling and handwriting are often symptomatic of a specific writing disability and should not be ignored (Wendling & Mather, 2009).
[3]Weak performance is typically associated with standard scores in the 85-89 range, whereas deficient performance is often associated with standard scores that are around 1SD below the mean or lower. Interpretations of weak or deficient performance based on standard scores that fall in these ranges are bolstered when they have ecological validity (e.g., when there is evidence that the abilities or processes identified as weak or deficient manifest in everyday classroom activities that require these abilities and processes).
[4]The major specific learning disability may be accompanied by secondary learning difficulties that also may be considered when planning the more intensive, individualized special education instruction directed at the primary problem. For information on linking assessment data to intervention, see Rapid Reference 4.xx.

**Flanagan, Oritz, & Alfonso (2013).** ***Essentials of Cross-Battery Assessment, 3rd Edition.*** **Hoboken, NJ: Wiley.**





Name: *Joe* Grade: *1*

Return to Identifying Info | DATA ENTRY for *g*-Value | Continue to g-Value

**Step 1:** Enter Composite Scores — In the left-hand column below enter the obtained standard score for each of the seven broad ability composites listed (see Appendix H for guidelines).

**Step 2:** Indicate "Yes" or "No" — In the right-hand column below indicate whether ability is "sufficient" by clicking on either the "Yes" or "No" button.

| CHC ABILITY COMPOSITES | Enter Standard Scores (Range 40 - 160)* | Select Yes or No |
|---|---|---|
| Gc - Crystallized Knowledge | 92 | Yes |
| Gf - Fluid Reasoning | 79 | No |
| Glr - Long-Term Storage & Retrieval | 93 | Yes |
| Gsm - Short-Term Memory | 100 | Yes |
| Gv - Visual Processing | 97 | Yes |
| Ga - Auditory Processing | 80 | No |
| Gs - Processing Speed | 102 | Yes |

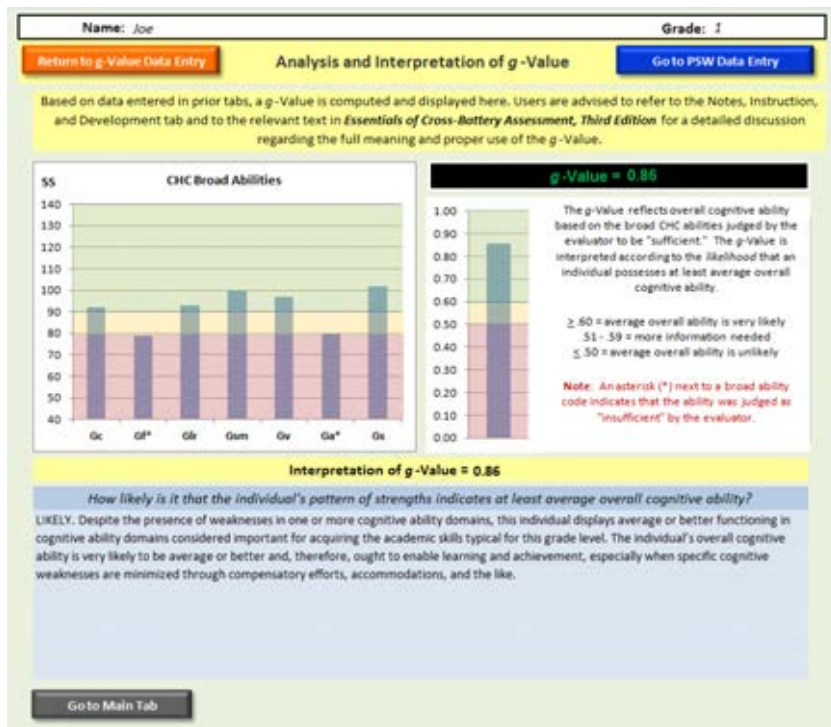
**Determining Sufficiency:** An ability is considered "sufficient" when it is judged by the evaluator to contribute meaningfully to the individual's overall cognitive functioning, particularly for the purpose of facilitating academic performance (e.g., acquisition and development of academic skills). Typically, standard scores around 90 or higher are sufficient, as abilities associated with scores in this range (≥ 90) often contribute meaningfully to the individual's overall cognitive functioning and, therefore, support learning. When standard scores are around 90 or lower, clinical judgment is necessary to determine if the broad ability constrains or inhibits learning and achievement.

*Note: If using T-Scores, convert them to Standard Scores (Deviation IQ metric) here: <--T-Score = Std. Score-->

| Standard Score Range | Percentile Range | Classification | Functional Description |
|---|---|---|---|
| < 70 | <2nd | Extremely Below Average/Normative Deficit | Markedly Insufficient |
| 70 - 79 | 2nd to 8th | Well Below Average/Normative Deficit | Insufficient |
| 80 - 89 | 9th to 24th | Below Average/Weakness [1] | Insufficient to Sufficient [2] |
| 90 - 109 | 25th to 74th | Average [2] | Sufficient |
| 110 - 119 | 75th to 89th | Above Average/Strength [1] | Efficient |
| 120 - 129 | 90th to 97th | Well Above Average/Normative Strength | Proficient |
| ≥ 130 | > 97th | Extremely Above Average/Normative Strength | Markedly Proficient |

[1] *Clinical judgment is likely necessary to determine if an ability reflected by a score in this range constrains learning and achievement for the individual.*
[2] *Scores between 85-115 (inclusive) fall within the normal limits of functioning.*

Go to Main Tab



Name: *Joe* Grade: *1*

Return to g-Value Data Entry | Analysis and Interpretation of *g*-Value | Go to PSW Data Entry

Based on data entered in prior tabs, a *g*-Value is computed and displayed here. Users are advised to refer to the Notes, Instruction, and Development tab and to the relevant text in ***Essentials of Cross-Battery Assessment, Third Edition*** for a detailed discussion regarding the full meaning and proper use of the *g*-Value.




*g*-Value = 0.86




The *g*-Value reflects overall cognitive ability based on the broad CHC abilities judged by the evaluator to be "sufficient." The *g*-Value is interpreted according to the *likelihood* that an individual possesses at least average overall cognitive ability.

≥ .60 = average overall ability is very likely
.51 - .59 = more information needed
≤ .50 = average overall ability is unlikely

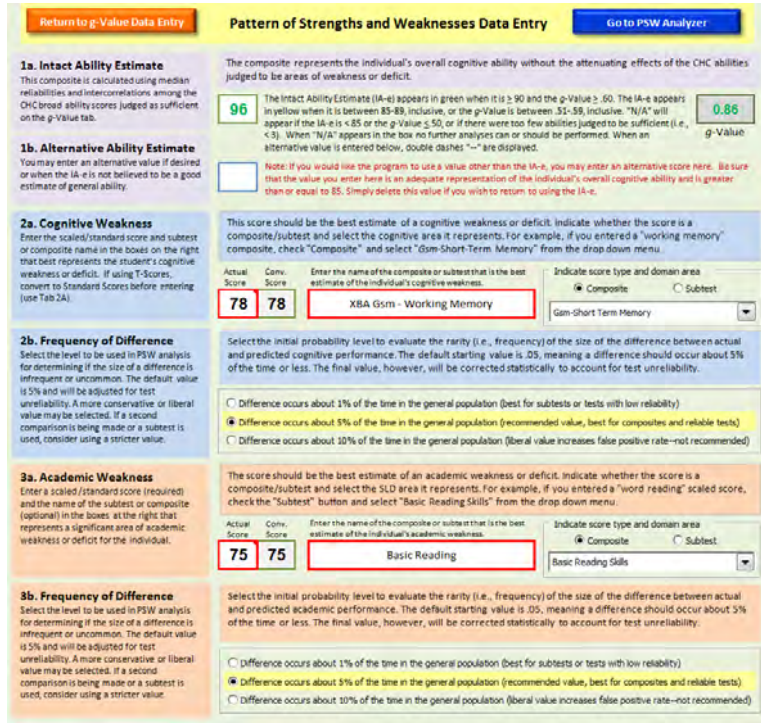
**Note:** An asterisk (*) next to a broad ability code indicates that the ability was judged as "insufficient" by the evaluator.

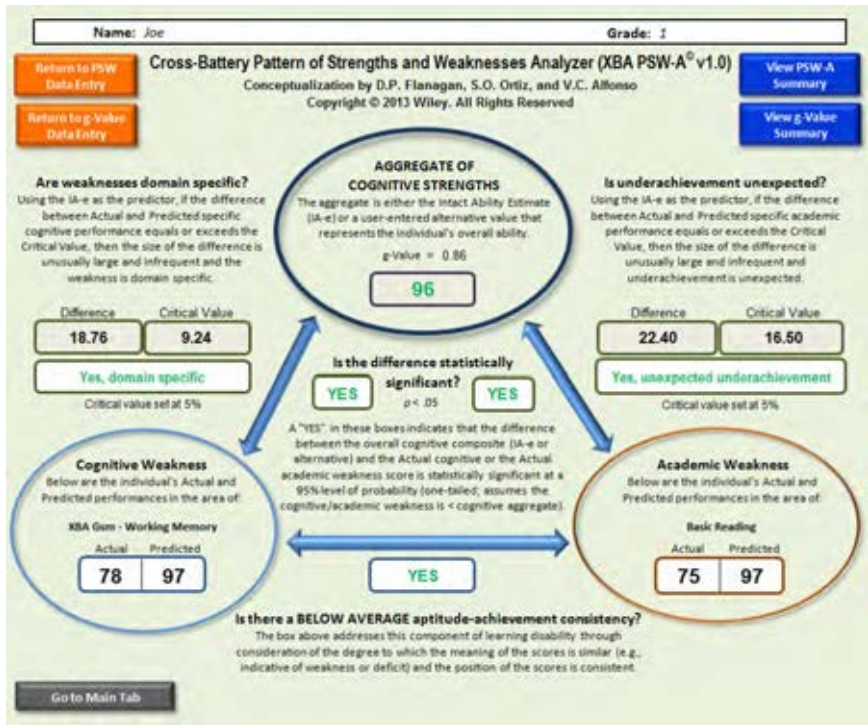
**Interpretation of *g*-Value = 0.86**

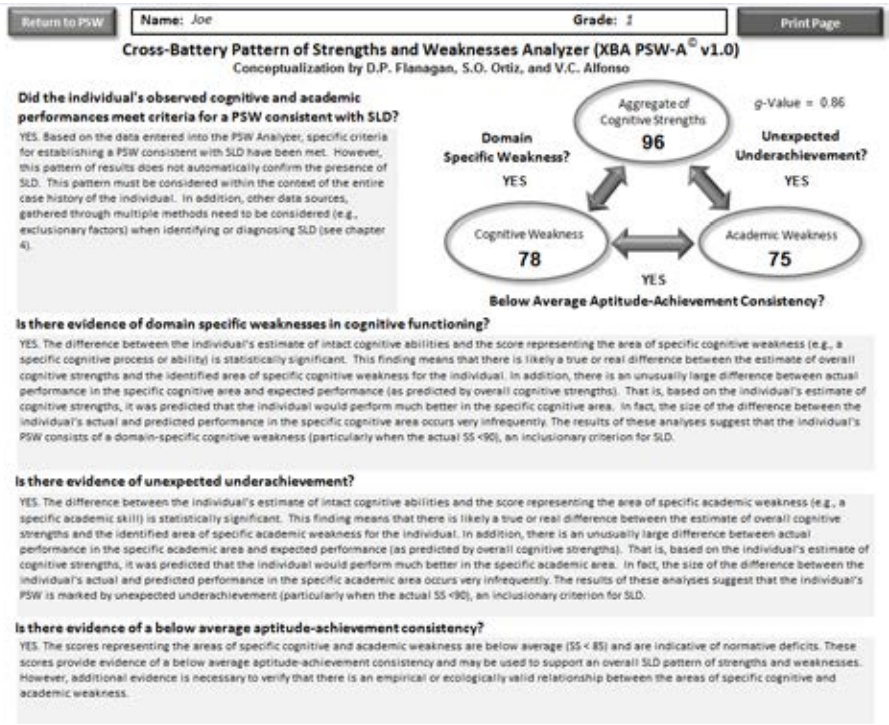
*How likely is it that the individual's pattern of strengths indicates at least average overall cognitive ability?*

LIKELY. Despite the presence of weaknesses in one or more cognitive ability domains, this individual displays average or better functioning in cognitive ability domains considered important for acquiring the academic skills typical for this grade level. The individual's overall cognitive ability is very likely to be average or better and, therefore, ought to enable learning and achievement, especially when specific cognitive weaknesses are minimized through compensatory efforts, accommodations, and the like.

Go to Main Tab


Return to g-Value Data Entry
Pattern of Strengths and Weaknesses Data Entry
Go to PSW Analyzer
1a. Intact Ability Estimate
This composite is calculated using median reliabilities and intercorrelations among the CHC broad ability scores judged as sufficient on the g-Value tab.
The composite represents the individual's overall cognitive ability without the attenuating effects of the CHC abilities judged to be areas of weakness or deficit.
96
The Intact Ability Estimate (IA-e) appears in green when it is ≥ 90 and the g-Value ≥ .60. The IA-e appears in yellow when it is between 85-89, inclusive, or the g-Value is between .51-.59, inclusive. "N/A" will appear if the IA-e is < 85 or the g-Value ≤ .50, or if there were too few abilities judged to be sufficient (i.e., < 3). When "N/A" appears in the box no further analyses can or should be performed. When an alternative value is entered below, double dashes "--" are displayed.
0.86
g-Value
1b. Alternative Ability Estimate
You may enter an alternative value if desired or when the IA-e is not believed to be a good estimate of general ability.
Note: If you would like the program to use a value other than the IA-e, you may enter an alternative score here. Be sure that the value you enter here is an adequate representation of the individual's overall cognitive ability and is greater than or equal to 85. Simply delete this value if you wish to return to using the IA-e.
2a. Cognitive Weakness
Enter the scaled/standard score and subtest or composite name in the boxes on the right that best represents the student's cognitive weakness or deficit. If using T-Scores, convert to Standard Scores before entering (use Tab 2A).
This score should be the best estimate of a cognitive weakness or deficit. Indicate whether the score is a composite/subtest and select the cognitive area it represents. For example, if you entered a "working memory" composite, check "Composite" and select "Gsm-Short-Term Memory" from the drop down menu.
Actual Score
Conv. Score
Enter the name of the composite or subtest that is the best estimate of the individual's cognitive weakness.
Indicate score type and domain area
Composite
Subtest
78
78
XBA Gsm - Working Memory
Gsm-Short Term Memory
2b. Frequency of Difference
Select the level to be used in PSW analysis for determining if the size of a difference is infrequent or uncommon. The default value is 5% and will be adjusted for test unreliability. A more conservative or liberal value may be selected. If a second comparison is being made or a subtest is used, consider using a stricter value.
Select the initial probability level to evaluate the rarity (i.e., frequency) of the size of the difference between actual and predicted cognitive performance. The default starting value is .05, meaning a difference should occur about 5% of the time or less. The final value, however, will be corrected statistically to account for test unreliability.
Difference occurs about 1% of the time in the general population (best for subtests or tests with low reliability)
Difference occurs about 5% of the time in the general population (recommended value, best for composites and reliable tests)
Difference occurs about 10% of the time in the general population (liberal value increases false positive rate--not recommended)
3a. Academic Weakness
Enter a scaled/standard score (required) and the name of the subtest or composite (optional) in the boxes at the right that represents a significant area of academic weakness or deficit for the individual.
The score should be the best estimate of an academic weakness or deficit. Indicate whether the score is a composite/subtest and select the SLD area it represents. For example, if you entered a "word reading" scaled score, check the "Subtest" button and select "Basic Reading Skills" from the drop down menu.
Actual Score
Conv. Score
Enter the name of the composite or subtest that is the best estimate of the individual's academic weakness.
Indicate score type and domain area
Composite
Subtest
75
75
Basic Reading
Basic Reading Skills
3b. Frequency of Difference
Select the level to be used in PSW analysis for determining if the size of a difference is infrequent or uncommon. The default value is 5% and will be adjusted for test unreliability. A more conservative or liberal value may be selected. If a second comparison is being made or a subtest is used, consider using a stricter value.
Select the initial probability level to evaluate the rarity (i.e., frequency) of the size of the difference between actual and predicted academic performance. The default starting value is .05, meaning a difference should occur about 5% of the time or less. The final value, however, will be corrected statistically to account for test unreliability.
Difference occurs about 1% of the time in the general population (best for subtests or tests with low reliability)
Difference occurs about 5% of the time in the general population (recommended value, best for composites and reliable tests)
Difference occurs about 10% of the time in the general population (liberal value increases false positive rate--not recommended)


Name: Joe
Grade: 1
Return to PSW Data Entry
Return to g-Value Data Entry
Cross-Battery Pattern of Strengths and Weaknesses Analyzer (XBA PSW-A© v1.0)
Conceptualization by D.P. Flanagan, S.O. Ortiz, and V.C. Alfonso
Copyright © 2013 Wiley. All Rights Reserved
View PSW-A Summary
View g-Value Summary
Are weaknesses domain specific?
Using the IA-e as the predictor, if the difference between Actual and Predicted specific cognitive performance equals or exceeds the Critical Value, then the size of the difference is unusually large and infrequent and the weakness is domain specific.
AGGREGATE OF COGNITIVE STRENGTHS
The aggregate is either the Intact Ability Estimate (IA-e) or a user-entered alternative value that represents the individual's overall ability.
g-Value = 0.86
96
Is underachievement unexpected?
Using the IA-e as the predictor, if the difference between Actual and Predicted specific academic performance equals or exceeds the Critical Value, then the size of the difference is unusually large and infrequent and underachievement is unexpected.
Difference
Critical Value
18.76
9.24
Yes, domain specific
Critical value set at 5%
Is the difference statistically significant?
YES
p < .05
YES
22.40
16.50
Yes, unexpected underachievement
Critical value set at 5%
A "YES" in these boxes indicates that the difference between the overall cognitive composite (IA-e or alternative) and the Actual cognitive or the Actual academic weakness score is statistically significant at a 95% level of probability (one-tailed; assumes the cognitive/academic weakness is < cognitive aggregate).
Cognitive Weakness
Below are the individual's Actual and Predicted performances in the area of:
XBA Gsm - Working Memory
Actual
Predicted
78
97
YES
Academic Weakness
Below are the individual's Actual and Predicted performances in the area of:
Basic Reading
Actual
Predicted
75
97
Is there a BELOW AVERAGE aptitude-achievement consistency?
The box above addresses this component of learning disability through consideration of the degree to which the meaning of the scores is similar (e.g., indicative of weakness or deficit) and the position of the scores is consistent.
Go to Main Tab


Return to PSW | Name: Joe | Grade: 1 | Print Page

Cross-Battery Pattern of Strengths and Weaknesses Analyzer (XBA PSW-A© v1.0)

Conceptualization by D.P. Flanagan, S.O. Ortiz, and V.C. Alfonso

**Did the individual's observed cognitive and academic performances meet criteria for a PSW consistent with SLD?**

YES. Based on the data entered into the PSW Analyzer, specific criteria for establishing a PSW consistent with SLD have been met. However, this pattern of results does not automatically confirm the presence of SLD. This pattern must be considered within the context of the entire case history of the individual. In addition, other data sources, gathered through multiple methods need to be considered (e.g., exclusionary factors) when identifying or diagnosing SLD (see chapter 4).

Aggregate of Cognitive Strengths 96

g-Value = 0.86

Domain Specific Weakness? YES

Unexpected Underachievement? YES

Cognitive Weakness 78

Academic Weakness 75

YES

Below Average Aptitude-Achievement Consistency?

**Is there evidence of domain specific weaknesses in cognitive functioning?**

YES. The difference between the individual's estimate of intact cognitive abilities and the score representing the area of specific cognitive weakness (e.g., a specific cognitive process or ability) is statistically significant. This finding means that there is likely a true or real difference between the estimate of overall cognitive strengths and the identified area of specific cognitive weakness for the individual. In addition, there is an unusually large difference between actual performance in the specific cognitive area and expected performance (as predicted by overall cognitive strengths). That is, based on the individual's estimate of cognitive strengths, it was predicted that the individual would perform much better in the specific cognitive area. In fact, the size of the difference between the individual's actual and predicted performance in the specific cognitive area occurs very infrequently. The results of these analyses suggest that the individual's PSW consists of a domain-specific cognitive weakness (particularly when the actual SS <90), an inclusionary criterion for SLD.

**Is there evidence of unexpected underachievement?**

YES. The difference between the individual's estimate of intact cognitive abilities and the score representing the area of specific academic weakness (e.g., a specific academic skill) is statistically significant. This finding means that there is likely a true or real difference between the estimate of overall cognitive strengths and the identified area of specific academic weakness for the individual. In addition, there is an unusually large difference between actual performance in the specific academic area and expected performance (as predicted by overall cognitive strengths). That is, based on the individual's estimate of cognitive strengths, it was predicted that the individual would perform much better in the specific academic area. In fact, the size of the difference between the individual's actual and predicted performance in the specific academic area occurs very infrequently. The results of these analyses suggest that the individual's PSW is marked by unexpected underachievement (particularly when the actual SS <90), an inclusionary criterion for SLD.

**Is there evidence of a below average aptitude-achievement consistency?**

YES. The scores representing the areas of specific cognitive and academic weakness are below average (SS < 85) and are indicative of normative deficits. These scores provide evidence of a below average aptitude-achievement consistency and may be used to support an overall SLD pattern of strengths and weaknesses. However, additional evidence is necessary to verify that there is an empirical or ecologically valid relationship between the areas of specific cognitive and academic weakness.

# PSW-A v1.0

## Flanagan, Ortiz, and Alfonso (2013)

- **Based on the most psychometrically defensible analyses of score differences**
  - Reynolds, C. R. (1985). Critical measurement issues in learning disabilities. *Journal of Special Education, 18*, 451-476.
  - Evans, L. D. (1990). A conceptual overview of the regression discrepancy model for evaluating severe discrepancy between I Q and achievement scores. *Journal of Learning Disabilities, 23*, 406-412.
  - Wright, J. (2002). Best practices in calculating severed discrepancies between expected and actual academic achievement scores: A step-by-step tutorial. Retrieved June 1, 2010 from: http://www.kasp.org/Documents/discrepancies.pdf

## McCloskey's Representation of a Cognitive Neuropsychological Discrepancy Model for SLD Identification

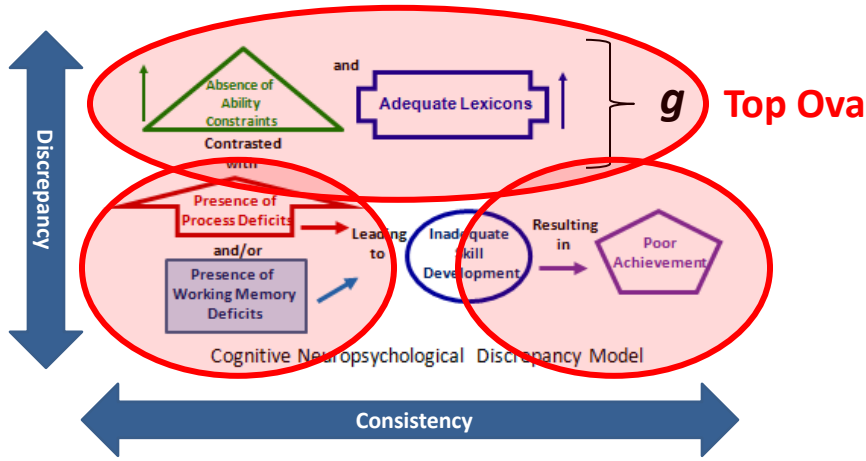



**Figure from: McCloskey, Whitaker, Murphy, & Rogers (2012). Intellectual, Cognitive, and Neuropsychological Assessment in Three Tier Service Delivery Systems in Schools. *In Flanagan & Harrison (Eds.), Contemporary Intellectual Assessment: Theories, Tests, and Issues (3rd edition). New York: Guilford***

# 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

# Flanagan et al.'s Operational Definition: 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) | ☐ History of visual disorder/disturbance |
| ☐ Vision test outdated (> 1 year) | ☐ Diagnosed visual disorder/disturbance |
| ☐ Passed | Name of disorder: _____ |
| ☐ Failed | ☐ Vision difficulties suspected or observed |
| ☐ Wears Glasses | (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:_____

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 | ☐ History of motor disorder |
| ☐ Gross Motor Delay/Difficulty | ☐ Diagnosed motor disorder |
| ☐ Improper pencil grip (Specify type: _____) | Name of disorder: _____ |
| ☐ Assistive devices/aids used (e.g., weighted pens, pencil grip, slant board) | ☐ 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. (____ )
- ☐ No History of Early or Developmental Problems in Primary Language
- ☐ Current Primary Language Proficiency: (Dates: _____ Scores: _____)
- ☐ Acculturative Knowledge Development (Circle one: High – Moderate – Low)
- ☐ Language(s) Other than English Spoken in Home
- ☐ Lack of or Limited Instruction in Primary Language (# of years _____)
- ☐ Current English Language Proficiency: (Date: _____ Scores: _____)
- ☐ 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: _____

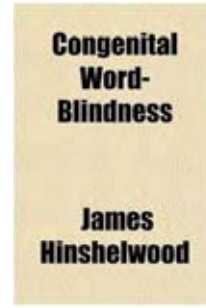
☐*No* factors listed here appear to be the primary cause of the student's academic weaknesses and learning difficulties

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

## 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

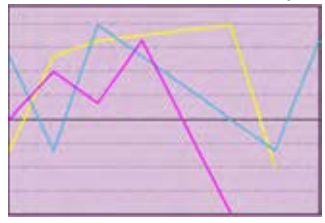
"it seems probably that psychometric tests as ordinarily employed give an entirely erroneous and unfair estimate of the intellectual capacity of these children" (p. 582)

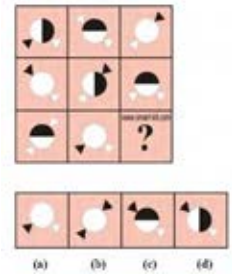
**Orton, 1925**

"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

# XBA Guiding Principles

I. Select a battery that best addresses the referral concerns
   - Consider co-normed tests first

II. Use clusters based on ***actual norms*** when they are available
   - Clusters yielded from the actual test battery rather than formulae based on subtest reliabilities and intercorrelations (although differences between actual norm-based clusters and those generated via formulae are negligible)

# XBA Guiding Principles

III. Select tests classified through an acceptable method
- Factor Analyses or Expert Consensus
  - Use relatively ***PURE*** CHC indicators
    - See Appendix B
  - Use 2 or more *qualitatively different* narrow ability indicators to represent each broad ability domain
    - Better representation with more diversity in narrow abilities
  - Use 2 or more *qualitatively similar* narrow ability indicators to represent each narrow ability domain


# XBA Guiding Principles

IV. When broad abilities are underrepresented, go out of battery
- ***Two qualitatively different indicators from another battery***
- ***Or one qualitatively different indicator and use CHC Analyzer Tab to create a broad ability composite***

# XBA Guiding Principles

V. When crossing batteries use tests developed and normed within a few years of one another
   - **Flynn effect**
   - **All tests in Cross-Battery book were normed within about 10 years of one another (2001 – 2012)**

VI. Select tests from the smallest number of batteries
   - **to minimize error that may be the result of differences in norm sample characteristics**

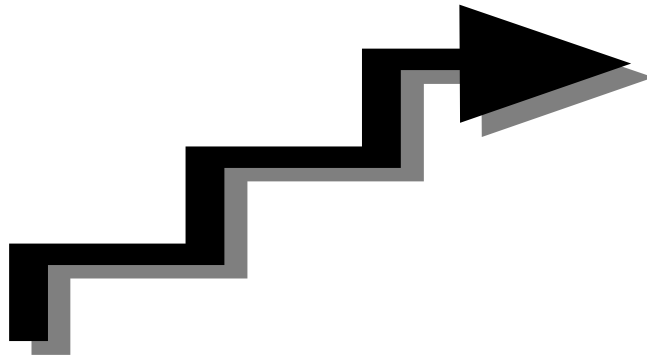
**VII. Establish ecological validity for test findings – e.g., manifestation of weaknesses or deficits**

**Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011)**

Definitions of CHC Cognitive Abilities and Neuropsychological Functions, Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Based on Flanagan, Alfonso, & Mascolo, 2012; *Contemporary Intellectual Assessment*, 3rd edition)

| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Fluid Reasoning (Gf) | •Novel reasoning and problem solving; ability to solve problems that are unfamiliar<br>•Processes are minimally dependent on prior learning<br>•Involves manipulating rules, abstracting, generalizing, and identifying logical relationships<br>•Fluid reasoning is evident in inferential reasoning, concept formation, classification of unfamiliar stimuli, categorization, and extrapolation of reasonable estimates in ambiguous situations (Shneider & McGrew, 2012)<br>•Narrow Gf abilities include Induction, General Sequential Reasoning (Deduction), and Quantitative Reasoning | ***Difficulties with:***<br>• Higher level thinking and reasoning<br>•Transferring or generalizing learning<br>•Deriving solutions for novel problems<br>•Extending knowledge through critical thinking<br>•Perceiving and applying underlying rules or process(es) to solve problems | ***Reading Difficulties:***<br>•Drawing inferences from text<br>•Abstracting main idea(s)<br>***Math Difficulties:***<br>•Reasoning with quantitative information (word problems)<br>•Internalizing procedures and processes used to solve problems<br>•Apprehending relationships between numbers<br>***Writing Difficulties:***<br>•Essay writing and generalizing concepts<br>•Developing a theme<br>•Comparing and contrasting ideas | •Develop student's skill in categorizing objects and drawing conclusions<br>•Use demonstrations to externalize the reasoning process<br>•Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es)<br>•Targeted feedback<br>•Cooperative learning<br>•Reciprocal teaching<br>•Use graphic organizers to arrange information in visual format<br>•Teach metacognitive strategies (mnemonics that are *memorable* and that *accurately represent* the learning task)<br>•Comparison of new concepts to previously learned concepts (same vs. different)<br>•Use analogies, similes, metaphors when presenting tasks |

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), ***Essentials of Specific Learning Disability Identification.*** New York, NY: John Wiley & Sons.



# IMPLEMENTING XBA STEP BY STEP

## Implementation of XBA: Step 1

- Selection of an Intelligence Battery
  - Consider:
    - Age and Developmental level
      - Floor and Ceiling
    - English language proficiency
      - Cultural Loading
      - Linguistic Demand
    - Specific referral concerns
      - SLD
      - MR (Intellectually Disabled)
      - Gifted

# Implementation of XBA: Step 2

- Identify the CHC ***Broad Abilities*** that are measured by the selected intelligence battery
  - *Adequate* = battery has at least 2 qualitatively different indicators of the broad ability.
  - *Underrepresented* = only one narrow aspect of the broad ability is included.
  - *Not measured*


**Rapid Reference 2.5. Representation of Broad CHC Abilities on Selected Cognitive, Achievement and Neuropsychological Batteries (Flanagan, Ortiz, & Alfonso, 2013)**

| Battery | Gf | Gc | Gv | Gsm | Glr | Ga | Gs | Grw | Gq | Gkn | Gp | Gh |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| WISC-IV | U | ✓ | ✓ | ✓ | -- | -- | ✓ | -- | -- | -- | -- | -- |
| WAIS-IV | ✓ | ✓ | ✓ | ✓ | -- | -- | ✓ | -- | -- | -- | -- | -- |
| WPPSI-IV | U | ✓ | ✓ | ✓ | -- | -- | ✓ | | | | | |
| WJ III/NU COG | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | U | -- | -- | -- | -- | -- |
| SB5 | ✓ | ✓ | U | ✓ | -- | -- | -- | -- | -- | -- | -- | -- |
| DAS-II | ✓ | ✓ | ✓ | ✓ | ✓ | U | U | -- | -- | -- | -- | -- |
| KABC-II | ✓ | ✓ | ✓ | U | U | -- | -- | -- | -- | -- | -- | -- |
| KTEA-II | -- | ✓ | -- | -- | ✓ | U | U | ✓ | U | -- | -- | -- |
| WIAT-III | U | ✓ | -- | -- | U | U | U | ✓ | U | -- | -- | -- |
| WJ III/NU ACH | U | ✓ | -- | -- | U | U | U | ✓ | ✓ | -- | -- | -- |
| NEPSY-II | U | ✓ | ✓ | ✓ | ✓ | U | U | -- | -- | U | ✓ | -- |
| D-KEFS | ✓ | U | U | U | ✓ | -- | ✓ | -- | -- | -- | U | -- |
| DWNB | -- | U | U | U | -- | -- | -- | -- | -- | -- | ✓ | ✓ |

*Note*: "✓" = adequate representation; "U" = underrepresented; "—" = not measured. There are four broad CHC abilities not included in this rapid reference (i.e., Olfactory Abilities [Go], Psychomotor Speed [Gps], Reaction and Decision Speed [Gt], and Kinesthetic Abilities [Gk]). Gf = Fluid Reasoning; Gc = Comprehension-Knowledge; Gv = Visual Processing; Gsm = Short-term Memory; Glr = Long-term Storage and Retrieval; Ga = Auditory Processing; Grw = Reading and Writing; Gq = Quantitative Knowledge; Gkn = Domain-specific Knowledge; Gp = Psychomotor Abilities; Gh = Tactile Abilities; WAIS-IV = Wechsler

# Implementation of XBA:
# Step 2 (Continued)

- If *underrepresented* or *not measured*:
  - Look out of battery to supplement

***Broad and Narrow CHC Ability Representation on Seven Current Intelligence Batteries***

**Table 1.4. Broad and Narrow CHC Ability Representation on Seven Current Intelligence Batteries**

| | *Gf* | *Gc* | *Gv* | *Gsm* | *Glr* | *Ga* | *Gs* |
|---|---|---|---|---|---|---|---|
| **WISC-IV** | Matrix Reasoning (I)<br>Picture Concepts (I) | Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, *Gf*-I)<br>Comprehension (K0)<br>Word Reasoning (VL, *Gf*-I) | Block Design (Vz)<br>Picture Completion (CF, *Gc*:K0) | Digit Span (MS, MW)<br>Letter-Number Sequencing (MW)<br>Arithmetic (MW; *Gf*: RQ) | **Not Measured** | **Not Measured** | Symbol Search (P)<br>Coding (R9)<br>Cancellation (P) |
| **WAIS-IV** | Matrix Reasoning (I)<br>Figure Weights (RQ) | Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, *Gf*-I)<br>Comprehension (K0) | Block Design (Vz)<br>Picture Completion (CF, *Gc*-K0)<br>Visual Puzzles (Vz) | Digit Span (MS, MW)<br>Letter-Number Sequencing (MW)<br>Arithmetic (MW; *Gf*: RQ) | **Not Measured** | **Not Measured** | Symbol Search (P)<br>Coding (R9)<br>Cancellation (P) |
| **WPPSI-IV** | Matrix Reasoning (I) | Picture Concepts (*Gc*: K0, *Gf*-I)<br>Vocabulary (VL)<br>Information (K0)<br>Similarities (VL, *Gf*-I)<br>Comprehension (K0) | Block Design (Vz)<br>Object Assembly (CS)<br>Picture Memory (MV) | **Not Measured** | **Not Measured** | **Not Measured** | Animal Coding (R9)<br>Bug Search (P)<br>Cancellation (P)<br>*(continued)* |

Flanagan, Ortiz, and Alfonso (2013). ***Essentials of Cross-Battery Assessment, 3rd edition. Hoboken, NJ: Wiley***

## *Broad and Narrow CHC Ability Representation on Seven Current Intelligence Batteries*

**Table 1.4. (*Continued*)**

| | *Gf* | *Gc* | *Gv* | *Gsm* | *Glr* | *Ga* | *Gs* |
|---|---|---|---|---|---|---|---|
| | | Receptive Vocabulary (VL) Picture Naming (VL) | Zoo Locations (MV) | | | | |
| **KABC-II** | Pattern Reasoning (I; *Gv*:Vz)[1] Story Completion (RG, *Gc*:K0)[2] | Expressive Vocabulary (VL) Verbal Knowledge (VL, K0) Riddles (VL, *Gf*:RG) | Face Recognition (MV) Triangles (Vz) Gestalt Closure (CS) Rover (SS, *Gf*: RG) Block Counting (Vz) Conceptual Thinking (Vz; *Gf*:I) | Number Recall (MS) Word Order (MS, MW) Hand Movements (MS, *Gv*: MV) | Atlantis (MA) Rebus (MA) Atlantis Delayed (MA) Rebus Delayed (MA) | **Not Measured** | **Not Measured** |
| **WJ III NU** | Concept Formation (I) Analysis-Synthesis (RG) | Verbal Comprehension (VL, *Gf*:I) General Information (K0) | Spatial Relations (Vz) Picture Recognition (MV) Planning (SS, *Gf*:RG) | Memory for Words (MS) Numbers Reversed (MW) Auditory Working Memory (MW) | Visual-Auditory Learning (MA) Retrieval Fluency (FI) Visual-Auditory Learning Delayed (MA) Rapid Picture Naming (NA; *Gc*: R9) | Sound Blending (PC) Auditory Attention (UR) Incomplete Words (PC) | Visual Matching (P) Decision Speed (P) Pair Cancellation (P) |
| **SB5** | Nonverbal Fluid Reasoning (I; *Gv*) Verbal Fluid Reasoning (I, RG, *Gc*:CM) Nonverbal Quantitative Reasoning (RQ, *Gq*:A3) Verbal Quantitative Reasoning (RQ, *Gq*:A3) | Nonverbal Knowledge (K0, LS, *Gf*:RG) Verbal Knowledge (VL,K0) | Nonverbal Visual-Spatial Processing (Vz) Verbal Visual-Spatial Processing (Vz, *Gc*:VL, K0) | Nonverbal Working Memory (MS, MW) Verbal Working Memory (MS, MW) | **Not Measured** | **Not Measured** | **Not Measured** |
| **DAS-II** | Matrices (I) Picture Similarities (I) Sequential & Quantitative Reasoning (RQ) | Early Number Concepts (VL, *Gq*: A3) Naming Vocabulary (VL) Word Definitions (VL) Verbal Comprehension (LS) Verbal Similarities (VL, *Gf*:I) | Pattern Construction (Vz) Recall of Designs (MV) Recognition of Pictures (MV) Copying (Vz) Matching Letter-Like Forms (Vz) | Recall of Digits-Forward (MS) Recall of Digits-Backward (MW) Recall of Sequential Order (MW) | Rapid Naming (NA; *Gc*: R9)[3] Recall of Objects-Immediate (M6) Recall of Objects-Delayed (M6) | Phonological Processing (PC) | Speed of Information Processing (P) |

*(continued)*

Flanagan, Ortiz, and Alfonso (2013). ***Essentials of Cross-Battery Assessment, 3rd edition. Hoboken, NJ: Wiley***

# Implementation of XBA: Step 3

- Identify the CHC ***Narrow Abilities and Processes*** that are measured by the selected intelligence battery


**Excerpt from Appendix B**

**In Cross-Battery Book (Flanagan et al., 2013)**

**FLUID INTELLIGENCE (Gf)**

The deliberate but flexible control of attention to solve novel, "on-the-spot" problems that cannot be performed by relying exclusively on previously learned habits, schemas, and scripts.

| Induction (I) | |
|---|---|
| The ability to observe a phenomenon and discover the underlying principles or rules that determine its behaviors. | |
| **DAS-II MATRICES** | 3-17 |
| **DAS-II PICTURE SIMILARITIES** | 2-6 |
| **KABC-II PATTERN REASONING (7-18 YEARS) (Gv:Vz)*** | 7-18 |
| **SB5 NONVERBAL FLUID REASONING (Gv)*** | 2-85+ |
| **SB5 VERBAL FLUID REASONING (RG;Gc:CM)*** | 2-85+ |
| **WECH MATRIX REASONING** | 4-90 |
| **WISC-IV PICTURE CONCEPTS** | 4-16 |
| **WJ III NU COG CONCEPT FORMATION** | 4-90+ |
| CTONI-2 GEOMETRIC ANALOGIES | 6-89 |
| CTONI-2 GEOMETRIC CATEGORIES | 6-89 |
| CTONI-2 PICTORIAL ANALOGIES | 6-89 |
| CTONI-2 PICTORIAL CATEGORIES | 6-89 |
| D-KEFS SORTING TEST: FREE SORTING | 8-89 |
| D-KEFS SORTING TEST: SORT RECOGNITION | 8-89 |
| KBIT-II MATRICES | 4-90 |
| NAB CATEGORIES | 18-97 |
| SHIPLEY-2 ABSTRACTIONS (RG) | 7-89 |
| TONI4 TEST OF NONVERBAL INTELLIGENCE-FOURTH EDITION | 5-85 |
| TVCF CLASSIFICATION | 8-89 |
| WASI-2 MATRIX REASONING | 6-90 |
| WNV MATRICES | 4-21 |
| D-KEFS Twenty Questions Test (Gc:LD) | 8-89 |
| NEPSY-II Animal Sorting (Gc:K0) | 7-16 |

| General Sequential Reasoning (RG) | |
|---|---|
| The ability to reason logically using known premises and principles. | |
| **KABC-II STORY COMPLETION (7-18 YEARS) (Gc:K0)*** | 7-18 |
| **WJ III NU COG ANALYSIS-SYNTHESIS** | 4-90+ |
| CTONI-2 GEOMETRIC SEQUENCES | 6-89 |
| CTONI-2 PICTORIAL SEQUENCES | 6-89 |
| KBNA CONCEPTUAL SHIFTING | 20-89 |
| NNAT-2 NAGLIERI NONVERBAL ABILITY TEST-SECOND EDITION (I) | 5-17 |
| PLAI-2 REASONING | 3-5 |
| RIAS ODD-ITEM OUT | 3-94 |
| D-KEFS Word Context Test (Gc:LD) | 8-89 |

| Quantitative Reasoning (RQ) | |
|---|---|
| The ability to reason, either with induction or deduction, with numbers, mathematical relations, and operators. | |
| **DAS-II SEQUENTIAL & QUANTITATIVE REASONING** | 6-17 |
| **SB5 NONVERBAL QUANTITATIVE REASONING (Gq:A3)*** | 2-85+ |
| **SB5 VERBAL QUANTITATIVE REASONING (Gq:A3)*** | 2-85+ |
| **WAIS-IV FIGURE WEIGHTS** | 16-90 |
| **WJ III NU DS NUMBER MATRICES** | 4-90+ |
| **WJ III NU DS NUMBER SERIES** | 4-90+ |
| **WJ III NU ACH Applied Problems (Gq:A3)** | 2-90+ |

# Implementation of XBA: Step 4

- Administer and Score Selected Intelligence Battery and Supplemental tests
  - *Follow directions specified by the test publisher's standardization procedures*.

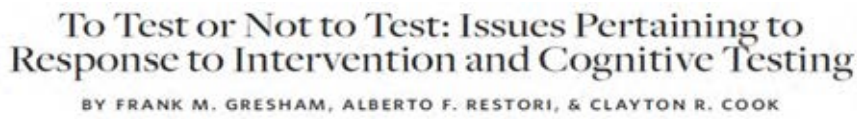

# Implementation of XBA: Step 5

- Enter Scores into the ***XBA Data Management and Interpretive Assistant*** (XBA DMIA v2.0)

# XBA is Commonplace – Acknowledge the Procedure in Your Report

- The results presented in this report were compiled from tests that do not share a common norm group; however, test results have been interpreted following the cross-battery approach and integrated with data from other sources including educational records, parent/teacher interviews, behavioral observations, work samples, and other test findings ***to ensure ecological validity***. Standardization was followed for all test administrations. No single test or procedure was used as the sole criterion for classification, eligibility or educational planning. Unless otherwise noted, the results of this evaluation are considered a reliable and valid estimate of [Student's Name] demonstrated skills and abilities at this time.

Adapted from D. Miller (2010)




# Why Is This The Question?

**"If these tests will give us a basis from which we can start to understand a child's difficulties, they will have justified the time spent on them. Anything which helps educators or parents to *understand* any phase of development or lack of development is of immeasurable value" (p. 189).**

Source:

Stanger, M. A., & Donohue, E. K. (1937). *Prediction and prevention of reading difficulties.* New York: Oxford University Press.

Slide from Nancy Mather

## RTI at Tiers I and II

- Students (Grade 1)
  - Amy
  - Belinda
  - Carl

- Tier I Screening
- At-risk in Reading
  - Decoding
  - Fluency
  - Comprehension
- Tier II Treatment Protocol
  - Reading Recovery

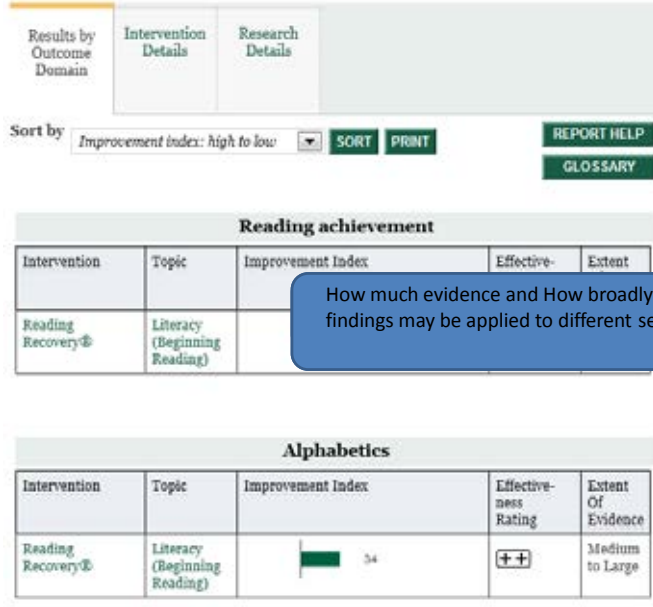
Mascolo and Flanagan (2011)

# What Works Clearinghouse

**Results. 1 Interventions found using these filters:**

- **Outcome Domains: Alphabetics, Early reading/writing, Reading fluency, Reading achievement**
- **Grade: 1**
- **Population: General Education**
- **Effectiveness: Positive Effects**
- **Extent of Evidence: Medium to Large**
- **Delivery Method: Small Group**
- **Program Type: Supplement**

# What Works Clearinghouse

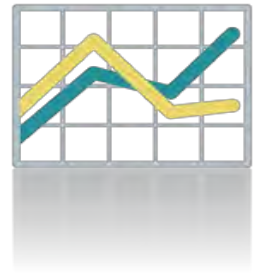


# Reading Recovery Results

- Amy, Belinda, and Carl are making some gains in Reading Recovery
- *No appreciable change in reading performance*
- Tier II "nonresponders"


- **WHAT DO SCHOOLS DO?**
  - move to Tier III?
  - conduct a "diagnostic assessment"?

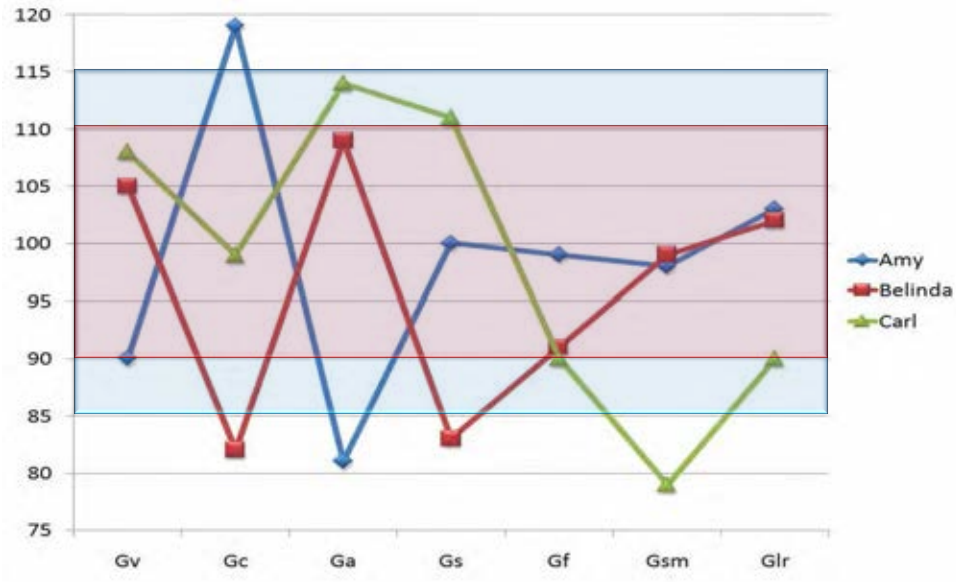
Mascolo and Flanagan (2011)



# Individual Differences Are Important

One Size Does Not Fit All

**Different Cognitive Ability Profiles Suggest Different Interventions**




## Different Cognitive Profiles Suggest Different Interventions


- *Gc* deficit – speech-language impairment?
- Comprehension is poor b/c of low *Gc*
- Poor vocabulary – needs to re-read to gain meaning, which impacts fluency
- *Intervention should focus on vocabulary development – Build Gc-VL, KO – and building fluency*
- Accommodation of extended time may be warranted due to a *Gs* deficit

Mascolo and Flanagan (2011)

# Florida Center for Reading Research

Text Talk

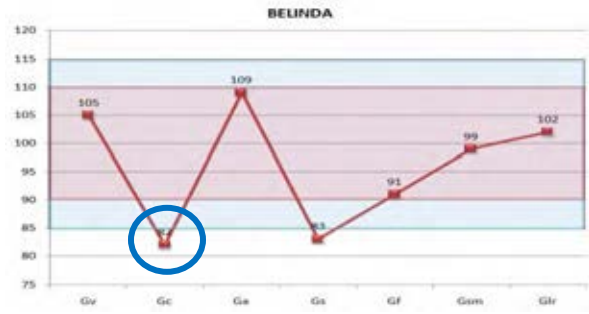
## What is Text Talk?

*Text Talk* is an oral language instruction program intended for all students in grades K-3. It is designed to supplement a school's core reading program with 20 minutes of daily whole or small group instruction delivered by the teacher. The goal of the program is to develop the student's ability to construct meaning of sophisticated vocabulary words within the context of read-alouds and explicit vocabulary instruction. These vocabulary words and ideas are contextualized with explicit descriptions of how the words are used in the story and through interactive discussions.

The *Text Talk* instructional approach was developed by Drs. Isabel L. Beck and Margaret G. McKeown based on findings from their many years of research. These findings are depicted in their book, Bringing Words to Life which describes the rationale and methods for teaching children rich, robust vocabulary words. These words are not ordinarily found in their speaking vocabulary but would most likely be in their conceptual lexicon and appear in a variety of texts. Described as Tier 2 words in their book, Beck and McKeown underscore the importance of providing students repeated opportunities to hear and use these new vocabulary words in different contexts. The instructional strategies discussed in Bringing Words to Life are applied in the *Text Talk* program.

http://teacher.scholastic.com/products/texttalk/overview/readaloud.htm

## Different Cognitive Profiles Suggest Different Interventions




## Other Interventions for Gc Deficit

**Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011, 2012)**

| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Crystallized Intelligence (Gc) | •Breadth and depth of knowledge and skills that are valued by one's culture<br>•Developed through formal education as well as general learning experiences<br>•Stores of information and declarative and procedural knowledge<br>•Reflects the degree to which a person has learned practically useful knowledge and matered valued skills (Schneider & McGrew, 2012)<br>•Narrow Gc abilities include General Verbal Information, Language Development, Lexical Knowledge, Listening Ability, Information about Culture, Communication Ability, and Grammatical Sensitivity | ***Difficulties with:***<br>•Vocabulary acquisition<br>•Knowledge acquisition<br>•Comprehending language or understanding what others are saying<br>•Fact-based/informational questions<br>•Using prior knowledge to support learning<br>•Finding the right words to use/say | ***Reading Difficulties:***<br>•Decoding (e.g., word student is attempting to decode is not in his/her vocabulary)<br>•Comprending (e.g., poor background knowledge about information contained in text)<br>***Math Difficulties:***<br>•Understanding math concepts and the "vocabulary of math"<br>***Writing Difficulties:***<br>•Grammar (syntax)<br>•Bland writing with limited descriptors<br>•Verbose writing with limited descriptors<br>•Inappropriate word usage<br>***Language Difficulties:***<br>•Understanding class lessons<br>•Expressive language – "poverty of thought" | •Provide an environment rich in language and experiences<br>•Frequent practice with and exposure to words<br>•Read aloud to children<br>•Vary reading purpose (leisure, information)<br>•Work on vocabulary building<br>•Teach morphology<br>•Use text talks<br>•Include supportive modalities (e.g., visuals, gestures) to increase understanding of language used<br>•Embed instruction within a meaningful context (e.g., relating words to learner experiences, increasing listening ability through game-like format)<br>•Use Vocabulary Cartoons (Burchers, 2000) |

Flanagan, D. P., Alfonso, V. C., Sotelo-Dynega, M., & Mascolo, J. T. (2012). Use of Ability Tests in the Identification of Specific Learning Disabilities (SLD) within the context of an Operational Definition. In D.P. Flanagan & P.L. Harrison, ***Contemporary intellectual assessment: Theories, tests, and issues (3rd edition)***. New York: Guilford.
Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), ***Essentials of Specific Learning Disability Identification.*** New York, NY: John Wiley & Sons.

# Gc Recommendations

- Provide an environment rich in language and experiences
- Frequent practice with and exposure to words
- Read aloud to children
- Vary reading purpose (leisure, information)

# What Do You Do?

- Enrich
- Relate
- Create
- Ratify
- Mnemonic devices
- Multidisciplinary curricula

*Information on this slide was presented by **Elaine Fletcher-Janzen** at the 3rd annual assessment conference, Fordham University. New York, NY (May, 2011).*

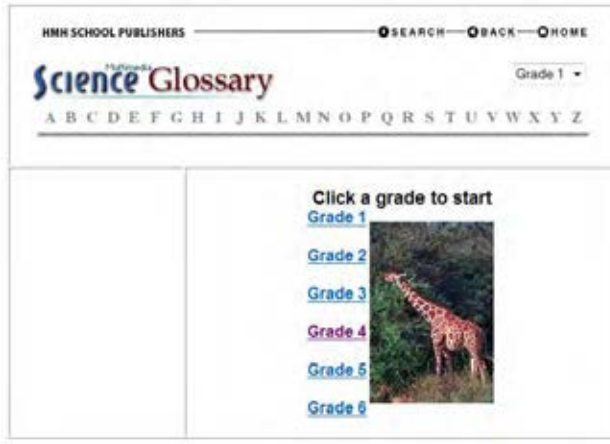
# Recommendations for Gc Deficit

- Work on vocabulary building
- Teach morphology
- Activities to build listening skills
- Explicitly teach listening strategies


## Programs/Techniques for Gc Deficits

- When selecting a program or a technique to intervene with a student with a Gc deficit, it may be helpful to consider one that
  - includes some sort of vocabulary building
  - includes supportive modalities to increase understanding of language used (e.g., visuals, gestures)
  - embeds instruction within a meaningful context (e.g., relating words to learner experiences, communicating word meanings with visuals, increasing listening ability through game-like format)

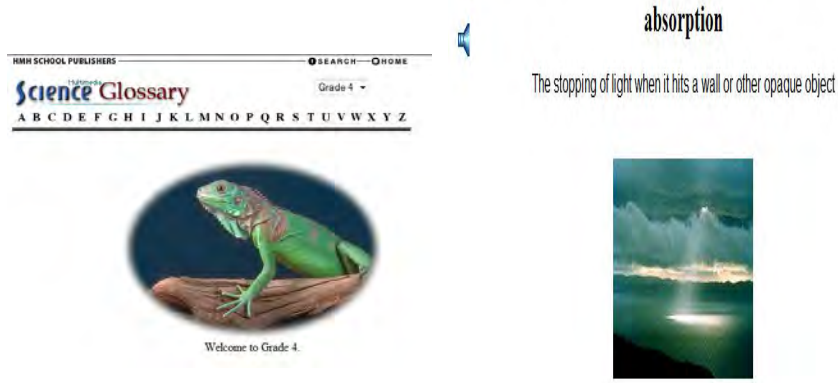
# Using Instructional Materials (Gc)- helps with lexical knowledge deficit




http://www.harcourtschool.com/glossary/science/

## Vocabulary with Sound

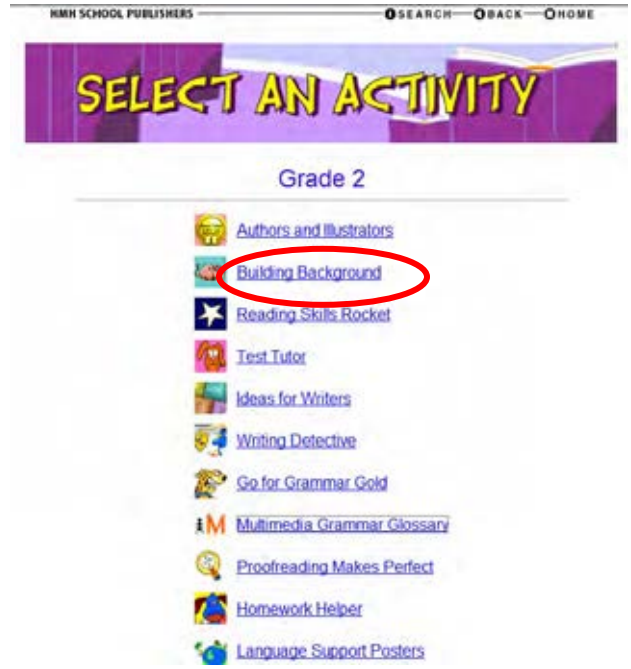
http://www.harcourtschool.com/glossary/science/




**Has the added audio if child needs it**

**Limited Background Knowledge? Build it!**

**(Harcourt online activities)**




## Belinda also has a Gs Deficit – Suggest Need to Work on Building Fluency

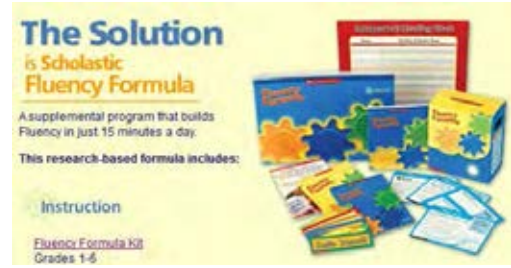
- Choral Repeated Reading
  - Students listen to the text being read and follow along by reading aloud and looking at the text (using their fingers to keep pace)
  - 10 to 15 minutes
  - Text can be higher than students' instructional level
  - Comprehension activities can be added
  - Feedback and assistance can be provided

## WWC: Reading Fluency interventions

- Peer-Assisted Learning Strategies (PALS)
  - Teachers train students
  - Students partner with peers, alternating the role of tutor while reading aloud, listening, and providing feedback in various structural activities

# WWC: Reading Fluency interventions

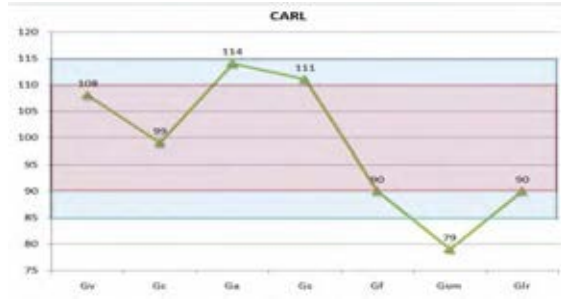
- Fluency Formula™
  - Grades 1-6
  - Emphasizes automatic recognition of words, decoding accuracy, and oral expression
  - 10-15 minutes daily; small groups
  - Uses workbooks, read-aloud anthologies, fluency activity cards and audio CDs




# Accommodations for Gs Deficit

- Extra time on exams
- Shortened in-class/home assignments
- Take exams orally
- Provide guided notes/class notes/topical outlines
- Books on tape
- Well established and understood daily routines and instructional routines
  - Because slow processing has a lesser effect when tasks are routine, *instructional activities should become as routine* or automatic as possible (e.g., important for students with TBI)
- Organizational supports
- Nonverbal supports
- Peer support
  - Cooperative learning
- Use of technology

## Different Cognitive Profiles Suggest Different Interventions




- *Gsm* deficit – memory span and working memory are deficient; visual memory ok
- Decoding is poor – he cannot hold the complete phonemic string in mind long enough to say the word
- Comprehension is poor because he needs to allocate all memory space decoding words and therefore cannot focus on meaning
- Fluency is impaired because he must re-read the text to gain meaning
- *Intervention should focus on developing a sight word vocabulary*
- Carl needs to be taught *compensatory strategies* to assist with poor *Gsm (text previews; guided notes; one comprehension question at a time)*

Mascolo and Flanagan (2011)

# Build Sight Words

Go to: http://www.mrsperkins.com/dolch.htm

**Print Flash Cards**

**Use folding-in technique (builds confidence)**

| Pre-primer | Primer | First |
|---|---|---|
| a | all | after |
| and | am | again |
| away | are | an |
| big | at | any |
| blue | ate | as |
| can | be | ask |
| come | black | by |
| down | brown | could |
| find | but | every |
| for | came | fly |
| funny | did | from |
| go | do | give |
| help | eat | going |
| here | four | had |
| I | get | has |
| in | good | her |
| is | have | him |
| it | he | his |
| jump | into | how |
| little | like | just |
| look | must | know |
| make | new | let |
| me | no | live |
| my | now | may |
| not | on | of |
| one | our | old |
| play | out | once |

Build Sight Words: Good Gv; Difficulty with Gsm





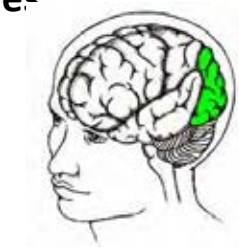
Carl needs strategies for Gsm deficits (memory span; working memory)

- **Give Directions in Multiple Formats:**
  - visual and verbal
  - encourage them to repeat directions and explain what they mean
  - give examples of what needs to be done

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

Carl needs strategies for Gsm deficits (memory span; working memory)

- **Teach Students to Over-learn Material**
  - several error-free repetitions are needed to solidify the information
- **Teach Students to Use Visual Images and Other Memory Strategies**



Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

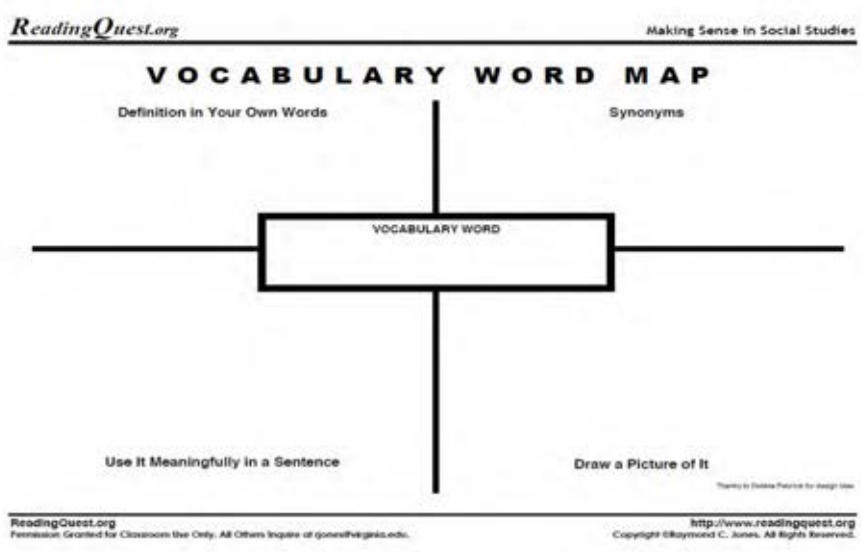
# Visual Images Used to Aid Vocabulary Development

- Reading
  - Vocabulary Cartoons II (Burchers, 2000)
    - Target word and definition are included along with a cartoon that reinforces the words meaning in a visual format
    - Grades 3+

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

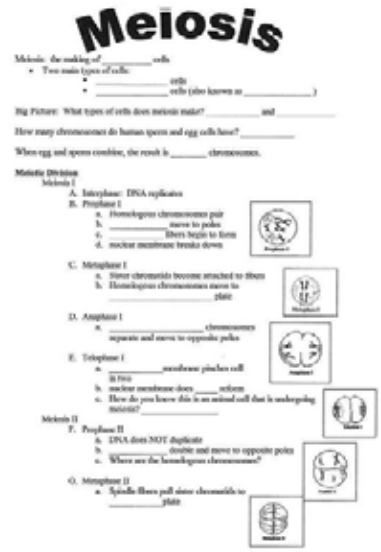

"A COLOSSAL FOSSIL."

Sight Word Development Aides by Visual Images and Multiple Associations



## Strategies for Gsm deficits (memory span; working memory)

- **Give Teacher-Prepared Handouts Prior to Class Lectures:**
  - brief outline
  - guided notes
  - partially completed graphic organizer that the student would complete during the lecture




Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

## Strategies for Gsm deficits (memory span; working memory)

- **Teach Students to Be Active Readers:**
  - students should underline, highlight, or jot key words down in the margins
  - To consolidate this information in long-term memory, they can make outlines or use graphic organizers

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

## Strategies for Gsm deficits (memory span; working memory)

- **Help Students Develop Cues When Storing Information:**
  - HOMES can be used to represent the names of the Great Lakes – Huron, Ontario, Michigan, Erie and Superior

- **Prime the Memory Prior to Teaching/Learning:**
  - discuss the vocabulary and the overall topic before a reading comprehension task is given. This will allow them to focus on the salient information and engage in more effective depth of processing.

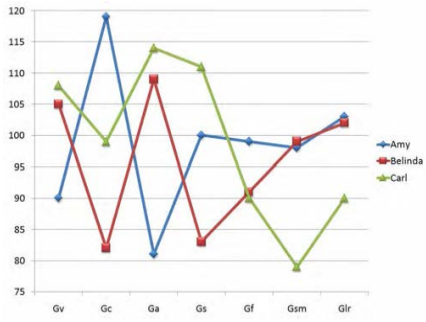
Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

## Strategies for Gsm deficits

- **Review Material Before Going to Sleep:**
  - information studied this way is better remembered
  - any other task that is performed after reviewing and prior to sleeping (such as getting a snack, brushing teeth, listening to music) interferes with consolidation of information in memory

Glenda Thorne, Ph.D., "10 Strategies to Enhance Students' Memory"; CLD.org

## Different Cognitive Ability Profiles Suggest Different Interventions




- **All had same academic deficits (decoding, comprehension, fluency)**
- ***All made slow gains with Reading Recovery***
- **All had different patterns of cognitive strengths and weaknesses**
- **Reading Recovery – allocating time to areas that do not need to be trained**
- **Not enough explicit instruction in main problem area *because the intervention was not tailored***

Mascolo and Flanagan (2010)

## Individual Differences ARE Important

- "A neuropsychological process that is important to reading skills development is working memory – it is a crucial process for early reading recognition and later reading comprehension. ***One must assess it if one is to develop the most appropriate method of intervention*** (Teeter et al., 1997)."

- "Given the findings from the neuroimaging and neuropsychological fields of deficient performance on measures of ***working memory, processing speed, auditory processing ability, and executive functions***, evaluation of these skills is necessary to determine the most appropriate program to fit the individual child's need."

**Semrud-Clikeman (2005)**

# Individual Difference ARE Important

- "The danger with not paying attention to ***individual differences*** is that we will repeat the current practice of simple assessments in curricular materials to evaluate a complex learning process and to plan for interventions with children and adolescents with ***markedly different needs and learning profiles."*** (Semrud-Clikeman, 2005)

- "Nonresponders" provide sound evidence that ***one size DOES NOT fit all.***

# Overall Ability and RTI

Fuchs and Young (2006*). On the irrelevance of intelligence in predicting responsiveness to reading instruction*, 73(1), pp. 8-30.

*Implications for Research and Practice*

So, findings from our review suggest that IQ frequently predicts responsiveness to reading instruction, and it can explain important variance in such responsiveness. Put differently, IQ often mediates or influences the effectiveness of reading instruction such that it is more or less effective for children with higher versus lower IQ scores. By

# Overall Ability and RTI

The rate of progress under remedial instruction was found to be a function of:

- the child's intelligence
- how early intervention is provided
- number of hours of training
- severity of the disability
- behavior and personality difficulties
- supervision of the remedial techniques

(Source: Monroe, 1932, p. 157)

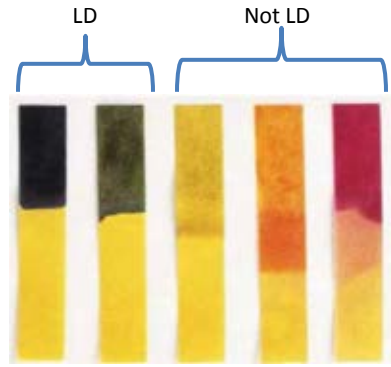
"Historical Perspective" Information from Nancy Mather, NYASP 2011

# On Third Method Approaches

- **Della Tofallo (2010; pp. 180-181) – RTRI or *Response to the Right Intervention***
- **Make no mistake…integrated models [third method approaches] of identifying (and serving) students with LDs do not arrive prepackaged along with dozens of studies touting their "scientific validation." However, *they are evidence-based* because they emanate from the marriage of a collective body of knowledge that has been acquired through research in the fields of neuroscience, pedagogy, assessment, and intervention.**

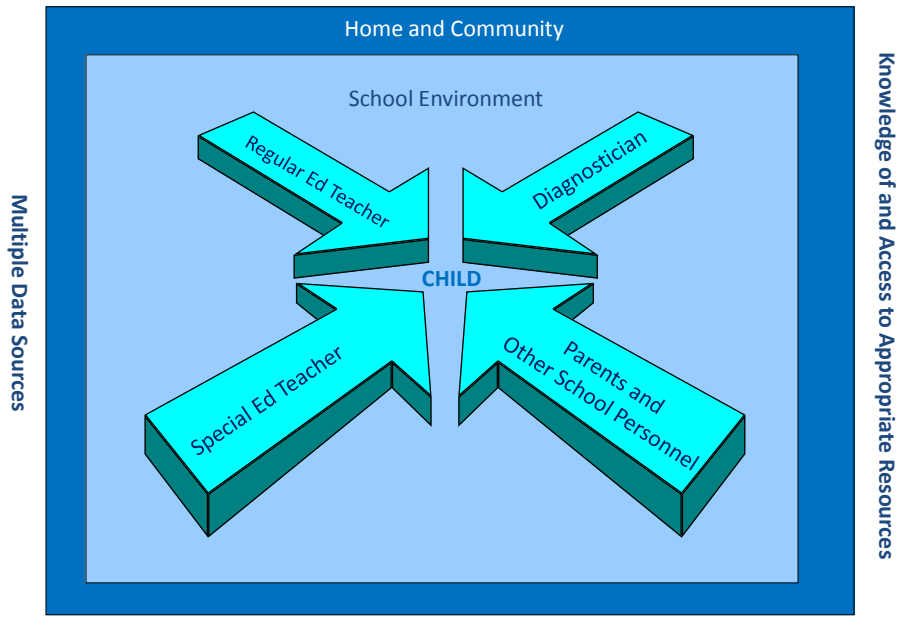
# Don't Forget

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




## What is the Utility of Test Results for Teachers?
## Linking Assessment to Intervention

**Instructional Planning is Complex and Requires a Team of Experts**




Mascolo and Flanagan (2011)

# Linking Assessment to Intervention

- Requires good instruments
- Well trained clinicians
- Well trained teachers and special educators
- *A mechanism in place for bringing data together to problem-solve in an attempt to offer the most effective instruction and interventions to children*

Mascolo and Flanagan (2011)

# Intervention Types

- Need to differentiate between
  - –Direct Interventions (remediation)
  - –Accommodations
  - –Compensation
  - –Instructional/Curricular Modifications

Mascolo and Flanagan (2011)

**Mascolo, Flanagan, and Alfonso (in press).** ***Essentials of Planning, Selecting, and Tailoring Interventions for the Unique Learner.*** **Hoboken, NJ: Wiley.**

| Tailoring Method | Brief Description | Examples |
|---|---|---|
| **Modification** | Changes content of material to be taught or measured; Typically involves changing or reducing learning or measurement expectations; May change the depth, breadth, and complexity of learning and measurement goals. | • Reducing the amount of material that a student is required to learn<br>• Simplifying material to be learned<br>• Requiring only literal (as opposed to critical/inferential) questions from an end of chapter comprehension check<br>• Simplifying test instructions and content |
| **Accommodation** | Changes conditions under which learning occurs or is measured, but does not change or reduce learning or assessment expectations. Accommodations may include timing, flexible scheduling, presentation, setting, and response accommodations. | • Extending time on exams<br>• Assigning a project in advance or allowing more time to complete the a project<br>• Aligning math problems vertically, as opposed to horizontally<br>• Providing a separate room to work<br>• Having a student dictate responses to a scribe |
| **Remediation** | Techniques or programs used to ameliorate cognitive and academic deficits. Academic interventions typically focus on developing a skill, increasing automaticity of skills, or improving the application of skills. Cognitive interventions typically focus on improving cognitive processes such as working memory capacity and phonological processing. There are many techniques, published programs, and software designed for the purpose of remediation. | • Evidence-based programs listed at What Works Clearing House: http://ies.ed.gov/ncee/wwc<br>• Reading programs appearing on the Florida Center for Reading Research website: www.fcrr.ord<br>• Techniques and materials from the Reading Rockets website: www.readingrockets.org<br>• CogMed (Pearson)<br>• Spotlight on Listening Comprehension (LinguiSystems, 2006) |
| **Compensation** | Procedures, techniques, and strategies that are intended to bypass or minimize the impact of a cognitive or academic deficit. | • Teaching the use of mnemonic devices<br>• Organizational aids or techniques<br>• Teaching a student to outline or use graphic organizers |

**Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011)**

Definitions of CHC Cognitive Abilities and Neuropsychological Functions, Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Based on Flanagan, Alfonso, & Mascolo, 2012; *Contemporary Intellectual Assessment*, 3rd edition)

| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Fluid Reasoning (Gf) | •Novel reasoning and problem solving; ability to solve problems that are unfamiliar<br>•Processes are minimally dependent on prior learning<br>•Involves manipulating rules, abstracting, generalizing, and identifying logical relationships<br>•Fluid reasoning is evident in inferential reasoning, concept formation, classification of unfamiliar stimuli, categorization, and extrapolation of reasonable estimates in ambiguous situations (Shneider & McGrew, 2012)<br>•Narrow Gf abilities include Induction, General Sequential Reasoning (Deduction), and Quantitative Reasoning | ***Difficulties with:***<br>• Higher level thinking and reasoning<br>•Transferring or generalizing learning<br>•Deriving solutions for novel problems<br>•Extending knowledge through critical thinking<br>•Perceiving and applying underlying rules or process(es) to solve problems | ***Reading Difficulties:***<br>•Drawing inferences from text<br>•Abstracting main idea(s)<br>***Math Difficulties:***<br>•Reasoning with quantitative information (word problems)<br>•Internalizing procedures and processes used to solve problems<br>•Apprehending relationships between numbers<br>***Writing Difficulties:***<br>•Essay writing and generalizing concepts<br>•Developing a theme<br>•Comparing and contrasting ideas | •Develop student's skill in categorizing objects and drawing conclusions<br>•Use demonstrations to externalize the reasoning process<br>•Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es)<br>•Targeted feedback<br>•Cooperative learning<br>•Reciprocal teaching<br>•Use graphic organizers to arrange information in visual format<br>•Teach metacognitive strategies (mnemonics that are *memorable* and that *accurately represent* the learning task)<br>•Comparison of new concepts to previously learned concepts (same vs. different)<br>•Use analogies, similes, metaphors when presenting tasks |

Flanagan, D. P., Alfonso, V. C., & Mascolo, J. T. (2011). A CHC-based Operational Definition of SLD: Integrating Multiple Data Sources and Multiple Data Gathering Methods. In Flanagan, D. P., & Alfonso, V. C. (Eds.), ***Essentials of Specific Learning Disability Identification.*** New York, NY: John Wiley & Sons.

# General Manifestation of Deficit in *Gf*

- Higher level thinking and reasoning
  - Difficulties with deductive reasoning (general to specific)
  - Difficulties with inductive reasoning (specific to general)
- 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

# Academic Manifestations of *Gf* Deficit

- Reading
  - Difficulties with inferential reading comprehension
  - Difficulty abstracting main idea
- Writing
  - Difficulty with essay writing and generalizing concepts
  - Difficulty developing a theme
  - Difficulty with comparing and contrasting ideas
- Math
  - Difficulties with math reasoning (word problems)
  - Difficulties with internalizing procedures and processes used to solve problems
  - Difficulty apprehending relationships between numbers

# Recommendations for *Gf* Deficit

- Develop student's skill in categorizing objects and drawing conclusions
- Use demonstrations to externalize the reasoning process
  - Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es)

# Recommendations for *Gf* Deficit

- Targeted feedback
- Cooperative learning
- Think Alouds
- Reciprocal teaching
- Graphic organizers to arrange information in visual format

# Targeted Feedback

- Feedback to students is important and needs to be *concrete* and *specific*
  - Highlight parts of the task that they executed appropriately
  - Identify where things went "wrong" or off-course
  - Describe how to correct the mistakes
  - Provide opportunity for self-correction and/or practice

# Targeted Feedback Example

1. Read the Problem
2. Select Important Information
3. Select Operation to Use
4. Solve the Problem
5. Check your work (ask yourself: does my answer make sense?)

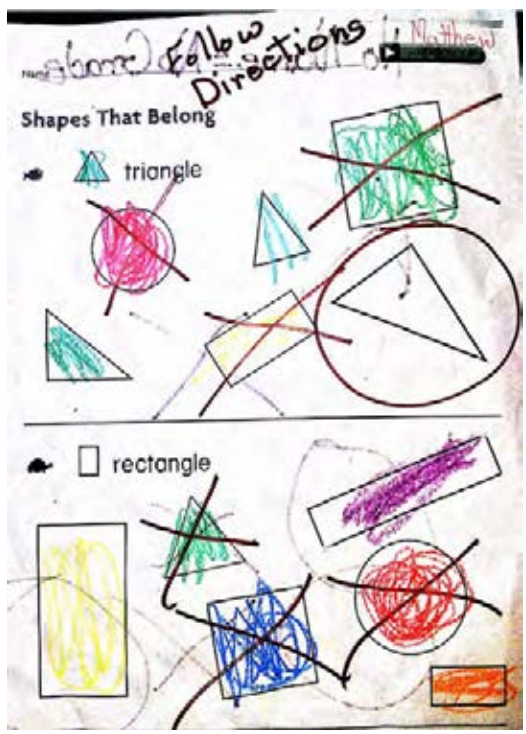
Ann baked 12 cookies for her school's bake fair. She had 3 customers in her line that each wanted a cookie. How many cookies did she have left after she served the customers?

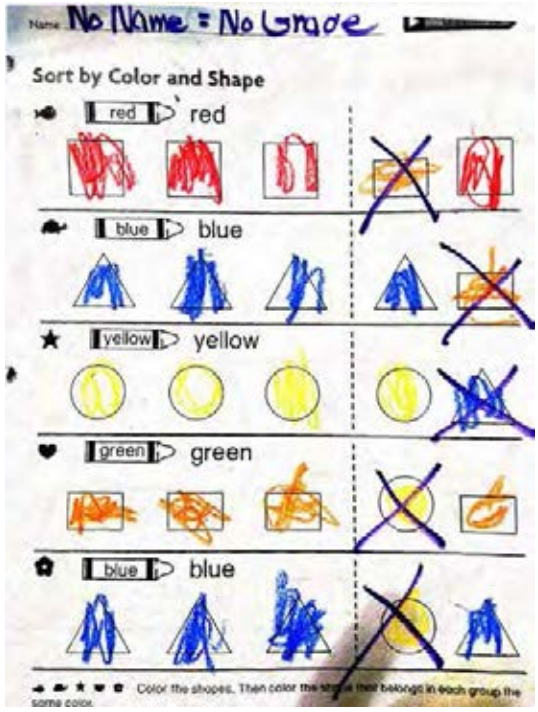
12

X 3

---

36

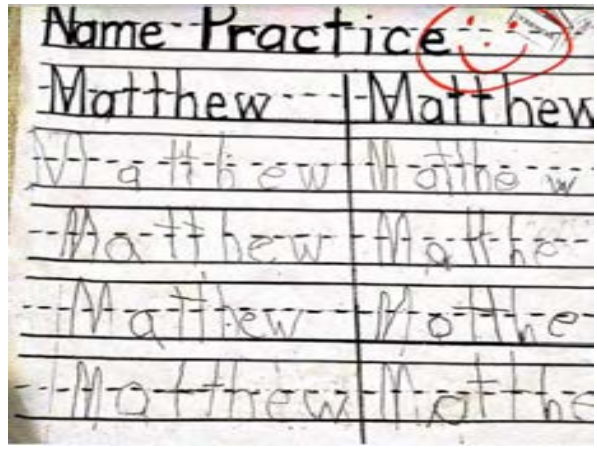


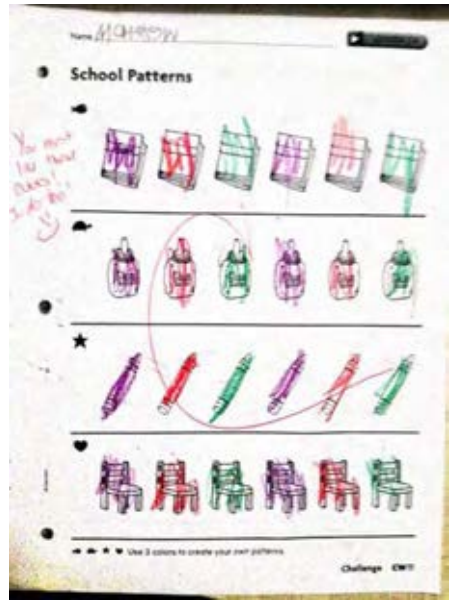



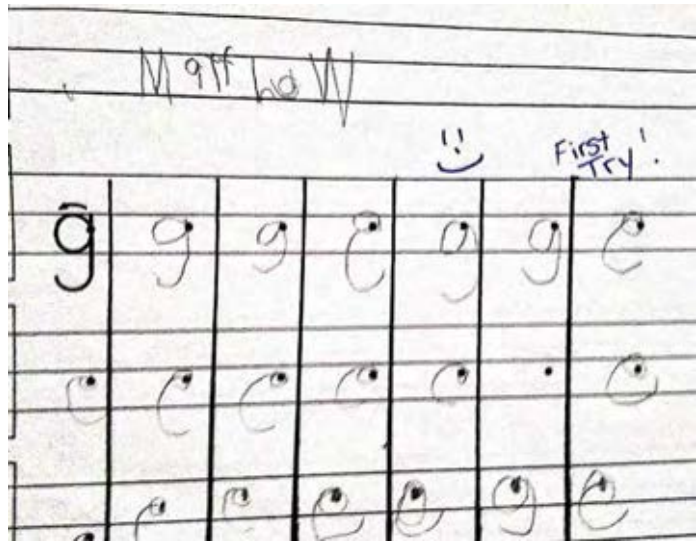

Mom: "Matt, do you know what this says?"
Matt: "No, I can't read."
Mom: "What do you think it says?"
Matt: "I'm bad."

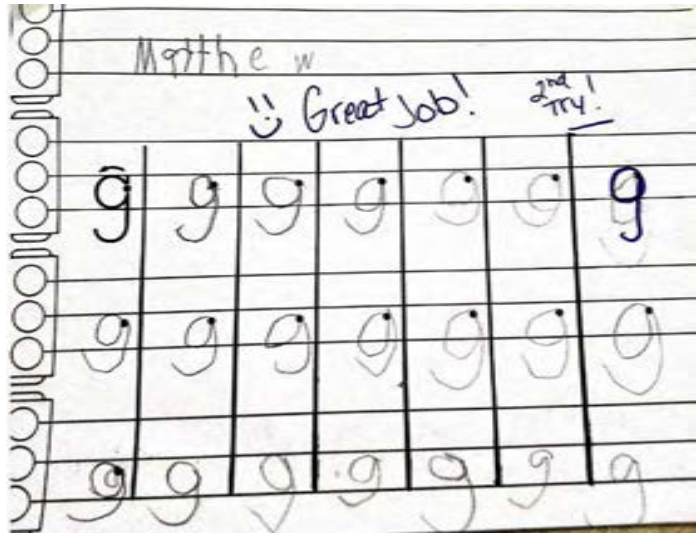
Implications: Matt does not want to go to school. He asked to go back to his previous teacher and class. Said he "hates school".

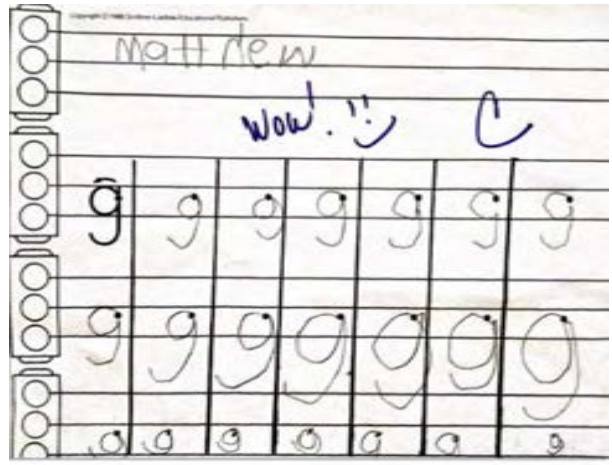
# Unexpectedly, Matt got a New Teacher


Name Practice
Matthew
Matthew


School Patterns


First Try!

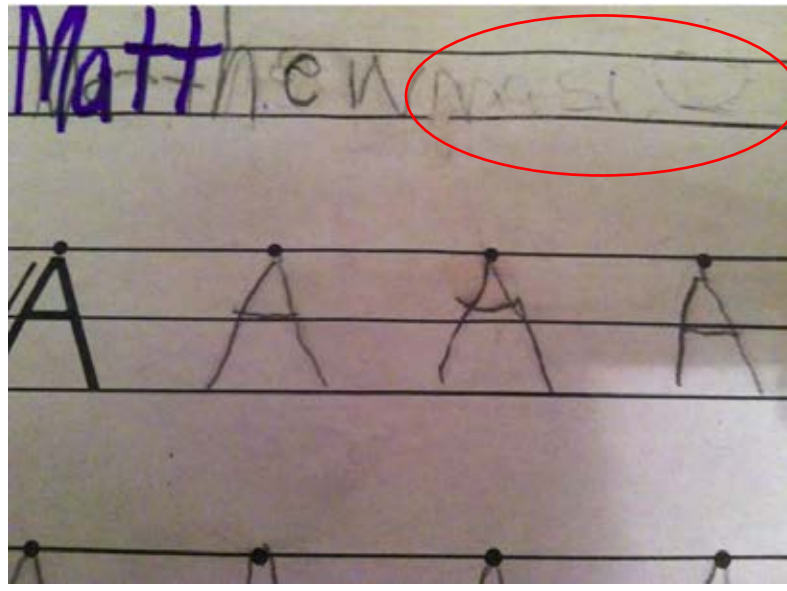

Great Job!
2nd Try!




Matt Writes His Last Name and Is Praised

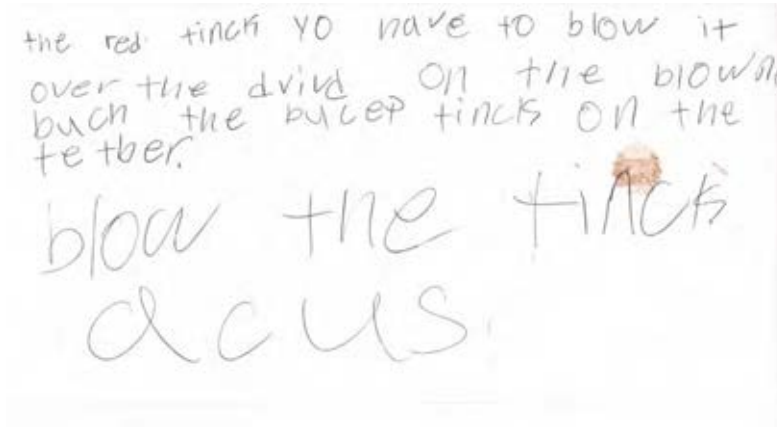
# MATT'S TEACHER RETURNS

Matt is Asked to ERASE his Last Name from his Papers!



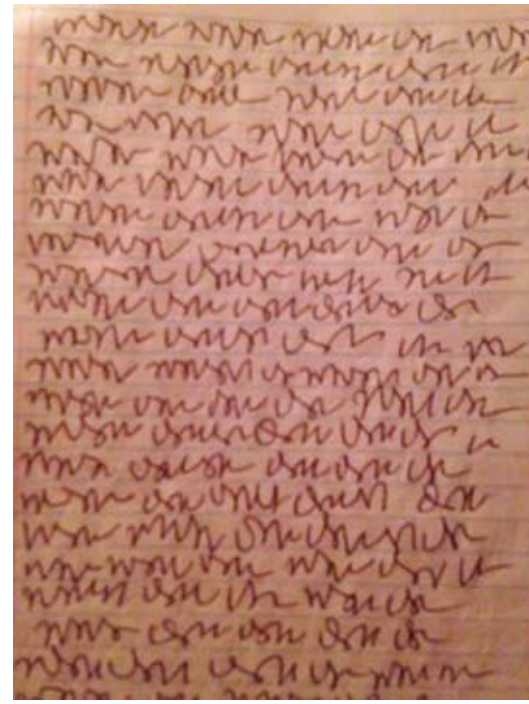
- **Dylan**
- **Age 10, Grade 5**
- **General Education with Supplemental Reading and Math**
- **Reads at end of 1st grade/early 2nd grade level**
  - **-Has been receiving "Wilson" for 3 years**
- **Math ability at early 2nd grade level**
- **Writing also significantly below grade level**
- **Receives "speech" weekly, presumably for articulation difficulties**

**Task; Grade 5**: Do something creative with random objects (e.g., balloon, DVD, whistle), such as tell a story or devise a game

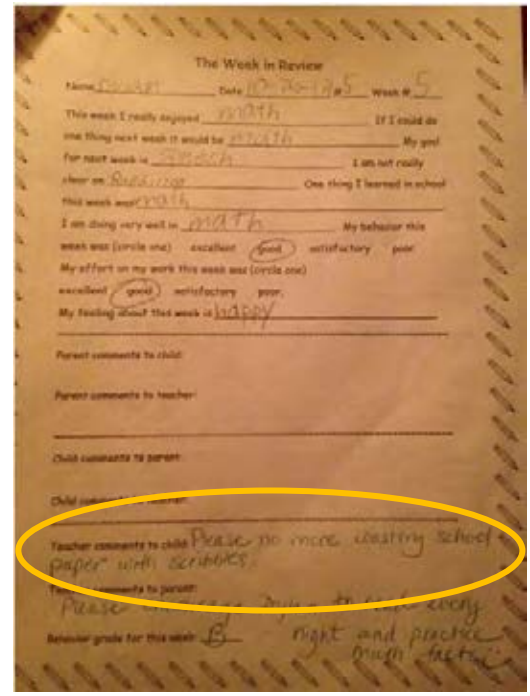



The red thing you have to blow it over the DVD on the balloon. Push the purple thing off the table. Blow the thing across.

•**<u>Assignment</u>: Write a summary of the findings from our science experiment. Write in cursive and use proper grammar and punctuation.**



**A Weekly Report from Dylan's Teacher**



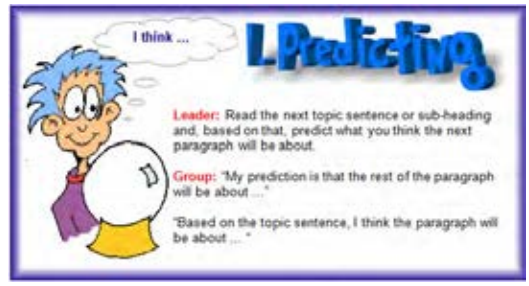
## Targeted Feedback is Critical For Student Success

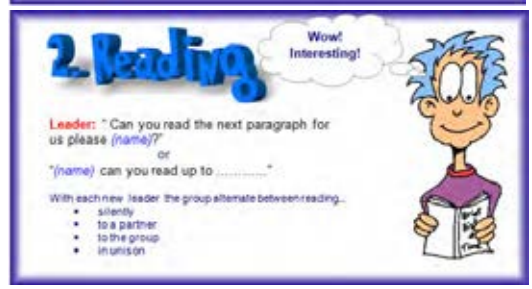
### Cooperative Learning

- Can be in pairs or small group
- Students with *Gf* deficits can be matched with students who have good reasoning skills and who are comfortable with "thinking aloud" and contributing to the group
- Important to assign tasks that capitalize upon student's strengths and assist in accomplishing your goal (e.g., student who needs help with reasoning may read well)
- Feedback/Processing of experience is important

# Reciprocal Teaching Cards

www.adrianbruce.com/reading/room4/recip

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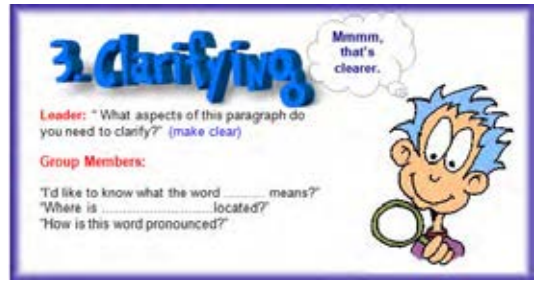


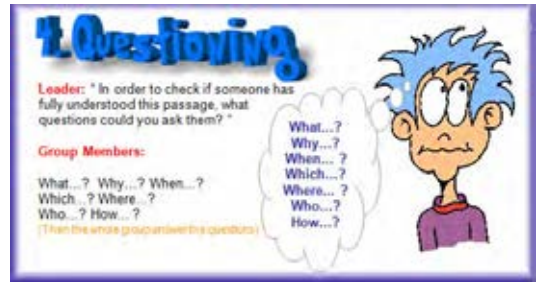

## Reciprocal Teaching Cards

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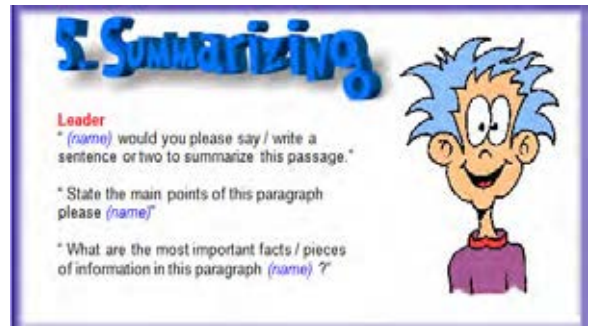
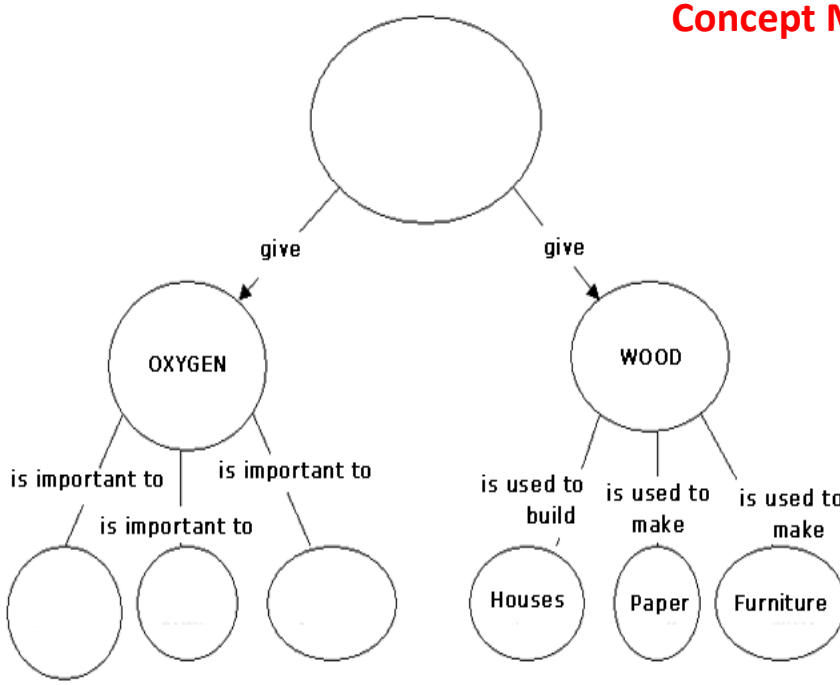



## Graphic Organizers

- Make use of graphic organizers (Venn diagrams, concept maps) to help the student
  - Understand the information conceptually through a visual modality
  - More readily link new information to known information
  - Make links from specific to general

## Concept Map




## Programs/Techniques for *Gf* Deficits

- When selecting a program or a technique to intervene with a student with a *Gf* deficit, it may be helpful to consider one that
  - includes explicit strategy instruction
  - focuses on the application of higher level thinking skills to the reading (e.g., making predictions, drawing inferences, abstracting, inferring character feelings) and writing process (e.g., persuasive writing, compare/contrast)
  - is multi-staged and includes modeling up through independent application of the strategy/technique

# Reading and Writing Examples (Gf)

- Inspiration/Kidspiration software (www.inspiration.com)
  - "Created for K-5 learners, Kidspiration® develops thinking, literacy and numeracy skills using proven visual learning principles. In reading and writing, Kidspiration strengthens word recognition, vocabulary, comprehension and written expression. With new visual math tools, students build reasoning and problem solving skills."

Kidspiration provides a cross-curricular visual workspace for K-5 learners. Students use visual tools combining pictures, text, numbers and spoken words to develop vocabulary, word recognition, comprehension, reasoning and problem solving skills.

Kidspiration works the way students think and learn and the way teachers teach. As students make visual connections, they build fundamental skills in reading, writing, math, science and social studies. Kidspiration offers activities in all curriculum areas, so students use visual learning naturally and confidently.

**Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011, 2012)**

| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Auditory Processing (Ga) | •Ability to analyze and synthesize auditory information<br>•One narrow aspect of Ga is a precursor to oral language comprehension (i.e., parsing speech sounds or Phonetic Coding)<br>•In addition to Phonetic Coding, other narrow Ga abilities include, Speech Sound Discrimination, Resistance to Auditory Stimulus Distortion, Memory for Sound Patterns, (and others related to music) | ***Difficulties with:***<br>•Hearing information presented orally, initially processing oral information<br>•Paying attention especially in the presence of background noise<br>•Discerning the direction from which auditory information is coming<br>•Discriminating between simple sounds<br>•Foreign language acquisition | ***Reading Difficulties:***<br>•Acquiring phonics skills<br>•Sounding out words<br>•Using phonetic strategies<br>***Math Difficulties:***<br>•Reading word problems<br>***Writing Difficulties:***<br>•Spelling<br>•Note taking<br>•Poor quality of writing | •Phonemic awareness activities<br>•Emphasis on sight-word reading<br>•Teach comprehension monitoring (e.g., does the word I heard/read make sense in context?)<br>•Annunciating sounds in words in an emphatic manner when teaching new words for reading or spelling<br>•Use work preview/text preview to clarify unknown words<br>•Provide guided notes during note taking activities<br>•Build in time for clarification questions related to "missed" or "misheard" items during lecture<br>•Supplement oral instructions with written instructions<br>•Shortening instructions<br>•Preferential seating<br>•Localizing sound source for student<br>•Minimizing background noise |

Flanagan, D. P., Alfonso, V. C., Sotelo-Dynega, M., & Mascolo, J. T. (2012). Use of Ability Tests in the Identification of Specific Learning Disabilities (SLD) within the context of an Operational Definition. In D.P. Flanagan & P.L. Harrison, *Contemporary intellectual assessment: Theories, tests, and issues (3rd edition)*. New York: Guilford.

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|---|---|---|---|---|
| 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<br>•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)<br>•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:***<br>•Learning new concepts<br>•Retrieving or recalling information by using association<br>•Performing consistently across different task formats (e.g., recognition versus recall formats)<br>•Rapid retrieval of information<br>•Learning information quickly<br>•Paired learning (visual-auditory)<br>•Recalling specific information (words, facts)<br>•Generating ideas rapidly | ***Reading Difficulties:***<br>•Accessing background knowledge to support new learning while reading<br>•Slow to access phonological representations during decoding<br>•Retelling or paraphrasing what one has read<br>***Math Difficulties:***<br>• Memorizing math facts<br>•Recalling math facts and procedures<br>***Writing Difficulties:***<br>•Accessing words to use during essay writing<br>•Specific writing tasks (compare and contrast; persuasive writing)<br>•Note-taking<br>•Idea generation/production<br>***Language Difficulties:***<br>•Expressive – circumlocutions, speech fillers, "interrupted" thought, pauses<br>•Receptive – making connections throughout oral presentations (e.g., class lecture) | •Repeated practice with and review of newly presented information<br>•Teach memory strategies (verbal rehearsal to support encoding, use of mnemonic devices)<br>•Use multiple modalities when teaching new concepts (pair written with verbal information)<br>•Limit the amount of new material to be learned; introduce new concepts gradually and with a lot of context<br>•Be mindful of when new concepts are presented<br>•Make associations between newly learned and prior information explicit<br>•Use lists to facilitate recall (prompts)<br>•Expand vocabulary to minimize impact of word retrieval deficits<br>•Build in wait-time for student when fluency of retrieval is an issue<br>•Use text previews to "prime" knowledge<br>•Provide background knowledge first before asking a question to "prime" student for retrieval |

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**Manifestations of Cognitive Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011)**

| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Visual Processing (Gv) | •Ability to analyze and synthesize visual information<br>•The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems (Schneider & McGrew, 2012)<br>•There are many narrow Gv abilities, some of which include Visualization, Speeded Rotation, Closure Speed, Flexibility of Closure, Visual Memory and Spatial Scanning | ***Difficulties with:***<br>•Recognizing patterns<br>•Reading maps, graphs, charts<br>•Attending to fine visual detail<br>•Recalling visual information<br>•Appreciation of spatial characteristics of objects (e.g., size, length)<br>•Recognition of spatial orientation of objects | ***Reading Difficulties:***<br>•Orthographic coding (using visual features of letters to decode)<br>•Sight-word acquisition<br>•Using charts and graphs within a text in conjunction with reading<br>•Comprehension of text involving spatial concepts (e.g., social studies text describing physical boundaries, movement of troops along a specified route)<br>***Math Difficulties:***<br>•Number alignment during computations<br>•Reading and interpreting graphs, tables, and charts<br>***Writing Difficulties:***<br>•Spelling sight words<br>•Spatial planning during writing tasks (e.g., no attention to margins, words that overhang a line)<br>•Inconsistent size, spacing, position, and slant of letters | •Capitalize on students phonemic skills for decoding tasks.<br>•Teach orthographic strategies for decoding (e.g., word length, shape of word); Use "cover, copy, compare" technique – go to: **http://www.ambleside primary.com/ambleweb/look/cover/look/cover.html**<br>•Provide oral explanation for visual concepts.<br>•Review spatial concepts and support comprehension through use of hands-on activities and manipulatives (e.g., using models to demonstrate the moon's orbital path).<br>•Highlight margins during writing tasks.<br>•Provide direct handwriting practice.<br>•Use graph paper to assist with number alignment. |

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|---|---|---|---|---|
| Processing Speed (Gs) | •Speed of processing, particularly when required to focus attention for 1-3 minutes<br>•Usually measured by tasks that require the ability to perform simple repetitive cognitive tasks quickly and accurately<br>•Narrow Gs abilities include Perceptual Speed, Rate-of-Test-Taking, Number Facility, Reading Speed, and Writing Speed (note that the latter two abilities are also listed under other broad CHC domains, including Grw) | ***Difficulties with:***<br>•Efficient processing of information<br>•Quickly perceiving relationships (similarities and differences between stimuli or information)<br>•Working within time parameters<br>•Completing simple, rote tasks quickly | ***Reading Difficulties:***<br>•Slow reading speed, which interferes with comprehension<br>•Need to reread for understanding<br>***Math Difficulties:***<br>•Automatic computations<br>•Computational speed is slow despite accuracy<br>•Slow speed can result in reduced accuracy due to memory decay<br>***Writing Difficulties:***<br>•Limited output due to time factors<br>•Labored process results in reduced motivation to produce<br>***Language Difficulties:***<br>•Cannot retrieve information quickly – slow, disrupted speech; cannot get out thoughts quickly enough<br>•Is slow to process incoming information, puts demands on memory store which can result in information overload and loss of meaning | •Repeated practice<br>•Speed drills<br>•Online activities/games (e.g., **http://www.academicskillbuilders.com/games/**)<br>•Computer activities that require quick, simple decisions<br>•Extended time<br>•Reducing the quantity of work required (including homework)<br>•Increasing "wait" times both after questions are asked and after responses are given<br>•Choral Repeated Reading<br>•Books on tape |

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|---|---|---|---|---|
| Short-Term Memory (Gsm) | •Ability to hold information in immediate awareness and use or transform it within a few seconds | ***Difficulties with:***<br>•Following multi-step oral and written instructions<br>•Remembering information long enough to apply it<br>•Remembering the sequence of information<br>•Rote memorization<br>•Maintaining one' place in a math problem or train of thought while writing | ***Reading Difficulties:***<br>•Reading comprehension (i.e., understanding what is read)<br>•Decoding multisyllabic words<br>•Orally retelling or paraphrasing what one has read<br>***Math Difficulties:***<br>•Rote memorization of facts<br>•Remembering mathematical procedures<br>•Multi-step problems and regrouping<br>•Extracting information to be used in word problems<br>***Writing Difficulties:***<br>•Spelling multisyllabic words<br>•Redundancy in writing (word and conceptual levels)<br>•Identifying main idea of a story<br>•Note taking | •Use meaningful stimuli to assist with encoding and allow for experiential learning (i.e., learning while doing)<br>•Provide opportunities for repeated practice and review<br>•Provide supports (e.g., lecture notes, guided notes, study guides, written directions) to supplement oral instruction<br>•Break down instructional steps for student<br>•Provide visual support (e.g., times table) to support acquisition of basic math facts<br>•Outline math procedures for student and provide procedural guides or flashcards for the student to use when approaching problems<br>•Highlight important information within a word problem<br>•have student write all steps and show all work for math computations<br>•Use writing programs or techniques that emphasize drafting first (e.g., Draft Builder 6)<br>•Teach chunking strategies |

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**Manifestations of CHC Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Ortiz, & Alfonso, 2013)**

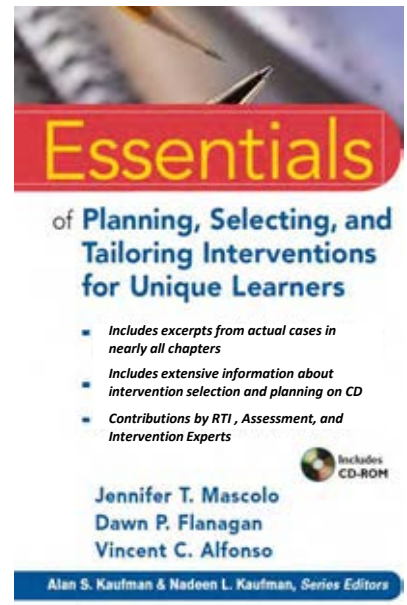
| CHC Broad Cognitive Abilities/ Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Attention | •Attention is a complex and multifaceted construct used when an individual must focus on certain stimuli for information processing. In order to regulate thinking and to complete tasks of daily living such as schoolwork, it is necessary to be able to attend to both auditory and visual stimuli in the environment. Attention can be viewed as the foundation of all other higher-order processing. Attention can be divided into five subareas: selective/focused attention, shifting attention, divided attention, sustained attention, and attentional capacity (Miller)<br><br>•It is important to identify the exact nature of the attentional problem(s) prior to selecting an intervention, teaching strategies, modifying the curriculum, or making accommodations | •Easily distracted<br>•Lacks attention to detail; makes careless mistakes<br>•Difficulty discerning demands of a task (e.g., where to begin or how to get started)<br>•May only be able to attend to task in short intervals<br>•Difficulty changing activities<br>•Difficulty applying a different strategy when task demands change<br>•Difficulty attending to more than one thing or task at a time<br>•Cannot perform well with faced with multiple stimuli or an abundance of detail | **Reading Difficulties:**<br>•Loses one's place easily<br>•Easily distracted while reading<br>•Does not pick up important details in text<br>**Math Difficulties:**<br>•Does not consistently attend to math signs<br>•Frequent mistakes on word problems<br>**Writing Difficulties:**<br>•Has difficulty completing long assignments; difficulty following time lines | •Provide a quiet place to work in the classroom during seatwork<br>•Provide reinforcement for timely completion of work<br>•Make sure student understands oral directions and has the same directions in written form for reference<br>•Provide a cue when transitioning<br>•Work with student to develop a time line for longer assignments<br>•Allow student to use a computer or dictate longer assignments<br>•Assist student in proofing math and writing assignments<br>•Reduce amount of repetitive seatwork<br>•Build in breaks during longer assignments<br>•Provide structure and highlight critical information in all academic tasks<br>•Provide student with a monitor with whom he or she can check in with once or twice a day (e.g., keeping track of assignments, books, schedule) |

**Manifestations of CHC Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan, Ortiz, & Alfonso, 2013)**

| CHC Broad Cognitive Abilities Neuropsychological Functions | Brief Definition[1] | General Manifestations of Cognitive Neuropsychological Weakness | Specific Manifestations of the Cognitive Neuropsychological Weakness | Recommendations/ Interventions |
|---|---|---|---|---|
| Executive Functioning | •Executive functioning is often understood as two broadly conceptualized areas that are related to the brain's frontal lobes: cognitive control and behavioral/emotional control. The ***cognitive*** aspects of executive functioning includes concept generation (Gc/Glr); problem solving (Gf); attentional shifting (attention; Gs); planning; organizing; working memory (Gsm); and retrieval fluency (Glr). The ***behavioral/emotional*** aspects of executive functioning relate to the inhibitory controls of behavior (e.g., impulsivity, regulation of emotional tone, etc.). (see Miller, 2010; KIDS Inc.) | ***Difficulty with:***<br>•learning new activities, generating concepts, and solving problems<br>•identifying goals and setting goals<br>•planning (e.g., begins project without necessary materials, does not allocate sufficient time to complete task)<br>•sequencing (e.g., may skip steps in multi-step problems)<br>•Prioritizing (e.g., not sure what's important when taking notes)<br>•organization (e.g., loses important papers; fails to turn in completed work; creates unrealistic schedule)<br>•Initiation (e.g., has difficulty getting started on tasks, assignments, etc.)<br>•pace (e.g., often runs out of time on homework and exams; has difficulty completing homework due to unrealistic timeline)<br>•shifting between activities flexibly; coping with unforeseen events<br>•self-monitoring (e.g., doesn't check to insure that each step was completed, doesn't check work before submitting it)<br>•emotional control (e.g., may exhibit inappropriate or over-reactive response to situations)<br><br>*Examples were adapted from Leslie E. Packer, Ph.D. (2003; see also Packer and Pratt's book, Challenging Kids, Challenged Teachers Woodbine Press, 2010)* | **Reading difficulties:**<br>•sequencing; telling a story chronologically<br>•prioritizing; extracting main idea and other important information<br>•problem solving; drawing inferences from text<br>**Math difficulties:**<br>•sequencing; remembering order of operations<br>•prioritizing; figuring out what is importing when solving word problems<br>•shifting; attending to math signs on a page<br>**Writing difficulties:**<br>•generating ideas to write about<br>•sequencing a story<br>•prioritizing main events in a story | •Assist student in organizing work by explaining (verbally and in writing or through visuals) the steps necessary to complete a task<br>•Use visual schedules and build in time throughout the day to review<br>•Use graphic organizers<br>•Set alarm (on watch or computer) to regulate timing of projects and tasks<br>•Plan and structure transition times and shifts in activities<br>•Break long assignments into smaller, mini-assignments and provide time frames for completing each<br>•Organize work space and minimize clutter; do this on a daily or weekly basis.<br>•Make a checklist for getting through assignments. For example, a student's checklist could include such items as: get out pencil and paper; put name on paper; put due date on paper; read directions; etc.<br><br>*Examples adapted from LD Online. Copyright 2008 by the National Center for Learning Disabilities, Inc. All rights reserved.* |

*For more information on making connections between cognitive strengths and weaknesses and instruction and intervention*

*Available February, 2014*



# Conclusions

Psychology in the Schools, Vol. 43(7), 2006
Published online in Wiley InterScience (www.interscience.wiley.com).


DOI: 10.1002/pits.20187

## AMERICAN ACADEMY OF SCHOOL PSYCHOLOGY SURVEY ON THE INDEPENDENT EDUCATIONAL EVALUATION FOR A SPECIFIC LEARNING DISABILITY: RESULTS AND DISCUSSION

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This article reviews the results of a survey of the Fellows of the American Academy of School Psychology (Academy; AASP) regarding the independent educational evaluation (IEE) for a specific learning disability (SLD). Academy Fellows were asked about important components of the IEE, desirable evaluator qualifications, and recommended criteria for a diagnosis of SLD in

Table 1
*Endorsed and Most Important (in bold) Components of an IEE for SLD (N = 50)*

| | Endorsed | | Importance | | |
|---|---|---|---|---|---|
| Component | *n* | % | *n* | % | Rank |
| Review of school-district records, including responsiveness to intervention | 48 | 96 | 19 | 38 | 7 |
| **Consultation with parent(s)** | 48 | 96 | 28 | 56 | **3** |
| **Assessment of cognitive abilities/processes** | 48 | 96 | 40 | 80 | **1** |
| **Interview with student** | 47 | 94 | 29 | 58 | **2** |
| Consultation with teachers | 47 | 94 | 21 | 42 | 6 |
| **Assessment of academic achievement** | 47 | 94 | 27 | 54 | **4** |
| Assessment and/or screening for associated problems, other etiologies, or co-occurring problems | 44 | 88 | 15 | 30 | 11 |
| Suggestions for meeting educational needs | 42 | 84 | 22 | 44 | 5 |
| Screening for neuropsychological problems (e.g., sensorimotor functions) | 41 | 82 | 19 | 38 | 7 |
| Observation of the student in the classroom | 39 | 78 | 17 | 34 | 9 |
| Report from teacher(s) | 38 | 76 | 10 | 20 | 14 |
| Educational diagnosis (IDEA) | 37 | 74 | 11 | 22 | 13 |
| Psychological diagnosis (e.g., DSM-IV–TR) | 35 | 70 | 17 | 34 | 9 |
| Attendance at school multidisciplinary committee meeting | 34 | 68 | 14 | 28 | 12 |
| Language use and exposure assessment | 30 | 60 | 8 | 16 | 15 |

*Endorsed and Most Important (in bold) Evaluator Qualifications to Conduct an IEE for SLD (N = 50)*

| | Endorsed | | Importance | | |
|---|---|---|---|---|---|
| Evaluator qualification | *n* | % | *n* | % | Rank |
| Assessment experience with children with specific learning disabilities | 50 | 100 | 25 | 50 | 3 |
| **Current knowledge of the nature of SLD** | 49 | 98 | 30 | 60 | **1** |
| **Training with a broad variety of cognitive assessment instruments** | 49 | 98 | 27 | 54 | **2** |
| Professional-level ability to communicate assessment results in written form | 48 | 96 | 19 | 38 | 4 |
| Understanding of special education law | 43 | 86 | 8 | 16 | 9 |
| Availability to attend due process hearings or otherwise defend their assessment report | 42 | 84 | 8 | 16 | 9 |
| Training with a broad variety of academic achievement assessment instruments | 41 | 82 | 14 | 28 | 6 |
| Understanding of APA and/or NASP ethics codes | 40 | 80 | 12 | 24 | 8 |
| Experience in direct school psychological services | 38 | 76 | 14 | 28 | 6 |
| Understanding of local education agency special education policies | 36 | 72 | 4 | 8 | 16 |
| Classroom observation skills | 34 | 68 | 5 | 10 | 15 |
| State department of education certification as a school psychologist | 34 | 68 | 7 | 14 | 13 |
| Licensure for independent practice by state department of health or board of psychologist examiners | 33 | 66 | 16 | 32 | 5 |

*Endorsed and Most Important (in bold) Criteria for Diagnosis of SLD in an IEE (N = 47)*

| | Endorsed | | Importance | | |
|---|---|---|---|---|---|
| Criteria | *n* | % | *n* | % | rank |
| **Clinical judgment (integration of quantitative and qualitative data of an experienced clinician; presence of multiple diagnostic markers)** | 44 | 94 | 31 | 66 | **1** |
| Presence and severity of an explanatory cognitive processing deficiency | 40 | 85 | 17 | 36 | 2 |
| Presence and severity of an ability/achievement discrepancy | 35 | 74 | 12 | 26 | 3 |
| response to intervention (RTI) | 26 | 55 | 9 | 19 | 4 |
| Ability/achievement consistency model | 22 | 47 | 4 | 09 | 6 |
| Number of years behind grade level | 12 | 26 | 5 | 11 | 5 |
| Underachievement cutoff model (achievement level cutoff scores) | 8 | 17 | 1 | 02 | 7 |

## Three Important Tasks for All School Personnel

- Work to ensure that RTI is up and running well, most especially in the early grades
- Work closely with teachers to create a supportive environment for students where they can access the curriculum at their instructional level

## Three Important Tasks for All School Personnel

- Conduct comprehensive assessments of students who do not respond as expected to quality instruction and intervention
  - Include cognitive/neuropsychological tests
  - Connect assessment findings to instructional strategies and interventions

## The Pendulum Problem in School Psychology

*Before we protest too much that we are not testers and that we decline such restrictive roles, let us remember our heritage, and our roots in the schools, and let us remember also that the* ***well trained school psychologist*** *should be the most skilled of anyone on a school staff in conducting thorough psychological and psychoeducational assessments. Rather than* ***abandoning the testing role*** *to others who will gladly assume the burden and perform the role, less thoroughly, less competently, and less expensively, we need to demonstrate to educators and parents the importance and value of* ***thorough assessment*** *conducted by* ***competent*** *school psychologists (Trachtman, 1979; p.386).*

*When we can demonstrate consistently that our comprehensive evaluations in the schools lead to positive outcomes for children, the debate will cease*

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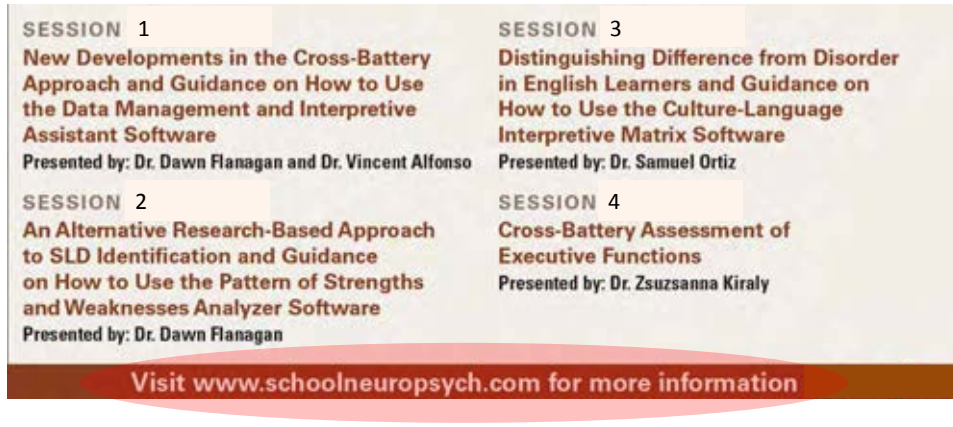


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