Comparison of Three Empirical Processing Strengths and Weaknesses Models for the Identification of Specific Learning Disabilities

Daniel C. Miller, Ph.D., ABPP
Denise E. Maricle
Principal Investigators
Alicia Jones
Research Assistant
Texas Woman's University

Grant Funded by the
Learning Disabilities Foundation of America

Presentation Outline

- Methods of SLD Identification
- Purpose of research study
- Phase I of Study: Clinical vignettes
- Phase II of Study: Apply Cases to PSW Models
- Research Results

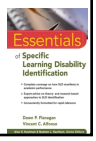
Federal Regulations (2006) Include Three Methods of SLD Identification

(34 CFR 300.311(a)(5)), (34 CFR 300.309(a)(2(ii))

- Ability-Achievement Discrepancy (AAD)
  - May allow
  - Cannot mandate
- Response-to-Intervention (RTI)
  - Must allow
  - "as part of" a comprehensive evaluation
- Alternative Research-based Approach (PSW)

Ability-Achievement Discrepancy is Insufficient for SLD Identification Because:

- It fails to adequately differentiate between students with LD from students who are low achievers.
- It is based on the erroneous assumption that IQ is a near-perfect predictor of achievement and is synonymous with an individual's potential.
- It is applied inconsistently across states, districts, and schools, rendering the diagnosis arbitrary and capricious.
- A discrepancy between ability and achievement may be statistically significant, but not clinically relevant.
- It is a wait-to-fail method because discrepancies between ability and achievement typically are not evident until the child has reached the 3rd or 4th grade.
- It does not identify the area of processing deficit.
- It leads to over-identification of minority students.
- It does not inform intervention.



Source: Hale, Wycoff, and Fiorello (2011). RTI and cognitive hypothesis testing for identification and intervention of specific learning disabilities: The best of both worlds. In Flanagan and Alfonso (Eds), *Essentials of specific learning disability identification*. Hoboken, N.J: Wiley.

RTI Cannot Be Used Alone For SLD Identification Because:

- RTI advocates cannot agree whether a standard protocol or a problem-solving RTI approach should be used.
- There is no agreed-upon curriculum, instructional methods, or measurement tools with adequate technical quality for use in an RTI model.
- RTI research has primarily focused on word reading, and methods across grades and different content areas have not been examined sufficiently.
- There is no consensus on what constitutes an empirically based approach, and whether using a single-subject design is sufficient to make any approach "empirical."
- There is no consensus on how to determine response, or lack of response, with different methods, resulting in different children being labeled as responders or nonresponders.
- There is no consensus on establishing appropriate achievement benchmarks or intervention timelines to determine the aim line slope (a critical component of determining individual responsiveness).
- There are no agreed-upon methods for teacher training or supervision methods to ensure interventions are carried out with integrity.
- There is no possible way to determine whether a child who is nonresponsive to intervention meets SLD statutory requirements.
- Failure to respond to intervention can happen for multiple reasons, only one of which is SLD.

Source: Hale, Wycoff, and Fiorello (2011).

Third Option is PSW
Federal Regulations Permit the Use of a PSW Model

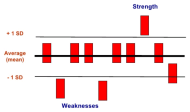
(34 CFR 300.311(a)(5)), (34 CFR 300.309(a)(2)(i))

- Evaluation documentation must consider whether the student exhibits a pattern of strengths and weaknesses
  - In performance, achievement or both
  - Relative to age, State-approved grade levels standards, *or intellectual development*
  - That is determined by the group to be relevant to the identification of SLD using appropriate instruments

"At the *current state of scientific knowledge*, it is only through a comprehensive evaluation of a student's cognitive and psychological abilities and processes that insights into the underlying proximal and varied root causes of [academic] difficulties can be ascertained and then specific interventions be provided targeted to each student's individual needs, *a process long advocated*"

From Reynolds and Shaywitz (2009)

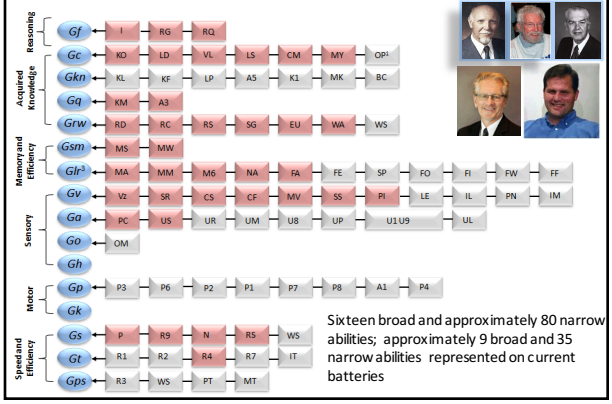
Third Option - PSW



- Requires an understanding of contemporary theory.
- Requires an understanding of the theoretical constructs that are measured by cognitive batteries.
- Requires understanding of cognitive processes and abilities related to achievement.
- May require cross-battery assessment to assess all the abilities and processes considered important based on referral and to follow up on aberrant test performances.
- Requires understanding of what SLD is and is not.

Flanagan, 2015

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

Summary of Relations between CHC Abilities and Specific Areas of Academic Achievement
(Berninger, 2013; Flanagan and colleagues, 2006, 2013; McGrew & Wendling, 2010; McGrew et al., 2014)

	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 for reading acquisition and development. 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.**
Gwm	Memory span (MS) and **working memory capacity (WM) or** attentional control, **Gwm important for overall reading success.**	Memory span (MS) and **working memory capacity (WM) or** attentional control, **Gmw important for overall math success.**	Memory span (MS) is important to writing, especially **spelling** skills whereas working memory has shown relations with advanced writing skills (e.g., **written expression**). Gmw important for overall writing success.
Gv	Orthographic Processing (often measured by tests of perceptual speed) – **reading fluency**	Visualization (VZ) is important primarily for higher level or **advanced mathematics** (e.g., geometry, calculus).	Orthographic Processing (often measured by tests of perceptual speed) - **spelling**
Ga	**Phonetic coding (PC) or "phonological awareness/processing" is very important during the elementary school years for the development of basic reading skills.**		**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" (also called speed of lexical access) is very important during the elementary school years.** Associative memory (MA) is also important.	Naming Facility (NA, or speed of lexical access); Associative Memory (MA) – **rapid retrieval of basic math facts**	Naming facility (NA) or "rapid automatic naming' **(also called speed of lexical access)** 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.**

References

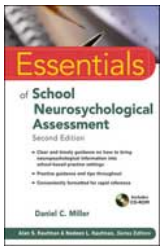
Jennifer T. Mascolo, Vincent C. Alfonso and Dawn P. Flanagan (2014)

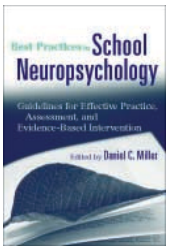
Dawn P. Flanagan and Patti L. Harrison (2012)

Dawn P. Flanagan, Samuel O. Ortiz and Vincent C. Alfonso (2013)

11

References



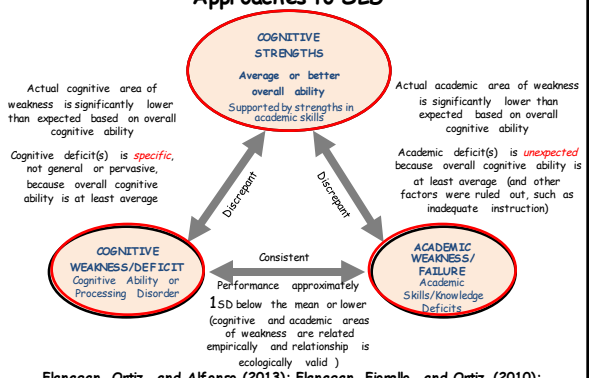


12

"Third Method" Alternative Research-Based Approaches to SLD Identification (PSW Methods)

- Flanagan, Oritz, Alfonso, & Mascolo (2002-Present)
  - Dual-Discrepancy/Consistency (within the context of an Operational Definition of SLD and a broader approach to "best practices" in CHC-based assessment) (automated in X-BASS)
- Naglieri, 1999, 2013
  - Discrepancy/Consistency (PASS Model; CAS-2 battery)
- Hale & Fiorello, 2004, 2011
  - Concordance-discordance model (based on neuropsych theory within the context of an hypothesis testing approach)
- Milt Dehn – software (intra-individual analysis of 11 specific processes) – may be used as part of a PSW analysis
- WISC-V – two discrepancy comparisons for PSW – automated in WIAT-III, KTEA-III scoring programs
- WJ IV Scholastic Aptitude – Achievement comparisons.

Conceptual Similarities Among Alternative Research-based Approaches to SLD



Flanagan, Ortiz, and Alfonso (2013); Flanagan, Fiorello, and Ortiz (2010); Hale, Flanagan, and Naglieri (2008)

Presentation Outline

- Methods of SLD Identification
- Purpose of research study
- Phase I of Study: Clinical vignettes
- Phase II of Study: Apply Cases to PSW Models
- Research Results

Purpose of the Research Study

The goal of the project is to compare three processing strengths and weakness (PSW) models for the identification of specific learning disabilities (SLD) using a common set of clinical case examples.

Methodology

These three PSW approaches are:

1. Cross-Battery Assessment Software System (X-BASS) (Ortiz, Flanagan, & Alfonso, 2015),
2. Concordance-Discordance Model of SLD identification (Hale & Fiorello, 2004; Hale, Wycoff, & Fiorello, 2010) and,
3. Psychological Processing Analyzer (Dehn, 2015).

Presentation Outline

- Methods of SLD Identification
- Purpose of research study
- Phase I of Study: Clinical vignettes
- Phase II of Study: Apply Cases to PSW Models
- Research Results

Methodology

Phase I of the Project:

- Multiple mini case histories were culled from an archival data set which were intended to reflect the presence or absence of SLD across one or more of the eight areas of SLD as defined by IDEA.
- The goal for this initial phase of the research study was to obtain consensus across a group of practitioners for data sets of both cognitive processing and academic achievement scores which do and do not identify SLD.

Methodology

Phase I of the Project:

- In October of 2014, twenty professionals credentialed as a Diplomate in School Neuropsychology from the American Board of School Neuropsychology (ABSNP), LLC were sent email invitations to participate in the first phase of the study.
- Several reminders were sent out by January, 2015, and ultimately 12 out of 20 people completed the data set review.
- Another twenty ABSNP, LLC professionals were recruited in Jan. 2015 and another 6 people completed the data set review.

Methodology

Phase I of the Project:

Total Number of Participants = 18 (45% return rate).

Terminal Degrees of Participants:

- Ph.D. n = 2
- PsyD n = 4
- Ed.D. n = 1
- Ed.S. n = 5
- MS/MA n = 6

States were participants live/work:

- CA n = 4
- CT n = 1
- FL n = 1
- GA n = 1
- IL n = 1
- MA n = 1
- NJ n = 2
- NV n = 1
- OH n = 2
- PA n = 1
- TX n = 3

Case Study Scenarios

- Case Study #1: Male Age 10-4 yrs. 4th Grader
  - SLD in math reasoning with a concurrent fluid reasoning deficit.
- Case Study #2: Female Age 8-3 yrs. 3rd Grader
  - SLD in reading decoding and listening comprehension with a concurrent auditory processing deficit.
- Case Study #3: Male Age 8-11 yrs. 3rd Grader
  - Gifted child with average achievement scores. No SLD.
- Case Study #4: Male Age 10-2 yrs. 4th Grader
  - SLD in reading decoding and math calculations with a concurrent long-term memory deficit.
- Case Study #5: Female Age 9-5 yrs. 4th Grader
  - SLD is reading fluency and oral expression with a concurrent processing speed deficit.
- Case Study #6: Male Age 9-4 yrs. 4th Grader
  - Low average cognitive abilities and achievement – No SLD.

Case Study Scenarios

- Case Study #7: Male Age 8-11 yrs. 3rd Grader
  - SLD in math calculations with a concurrent visual processing deficit.
- Case Study #8: Female Age 10-8 yrs. 5th Grader
  - SLD in math reasoning and written expression with a concurrent short-term memory deficit.
- Case Study #9: Female Age 11-11 yrs. 5th Grader
  - Intellectually disabled - No SLD.
- Case Study #10: Male Age 9-5 yrs. 4th Grader
  - SLD in reading comprehension and listening comprehension with a concurrent attention deficit.
- Case Study #11: Female Age 11-2 yrs. 5th Grader
  - SLD is written expression with a concurrent executive functions deficit.

Male Age 10-4 yrs. 4th Grader

SLD in math reasoning with a concurrent fluid reasoning deficit.

CASE STUDY #1

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Auditory Processing (Ga)							
CTOPP-Elison				(10)			
WJ III COG NU/ WJ IV OL – Sound Blending				97			
Visual Processing (Gv)							
Beery VMI - Visual Perception					112		
KABC-II - Gestalt Closure				(12)			
Attention							
TEA-Ch - Sky Search Attention Score				(11)			
WJ III- COG NU/ WJ IV COG - Pair Cancellation				109			

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Short-Term Memory (Gsm/Gwm)							
WISC-IV/V - Letter-Number Sequencing			(7)				
WJ III COG NU/ WJ IV COG - Numbers Reversed				92			
Long-Term Retrieval (Glr)							
WJ III COG DS/ WJ IV COG - Memory for Words				93			
WJ III ACH NU/ WJ IV COG - Story Recall				98			
Fluid Reasoning (Gf)							
WISC-IV/V - Matrix Reasoning		(5)					
WJ III COG NU/ WJ IV COG - Concept Formation		78					

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Processing Speed (Gs)							
WISC-IV/V - Coding				(9)			
WISC-IV/V - Symbol Search				(8)			
Executive Functions (Glr)							
KABC-II - Rover			(7)				
WJ III COG NU/ WJ IV COG - Analysis/Synthesis			89				

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Reading Decoding Skills							
WIAT-III - Pseudoword Decoding				102			
WJ III ACH NU/ WJ IV ACH - Letter-Word Identification				106			
Reading Comprehension							
WIAT-III - Reading Comprehension				99			
WJ III ACH NU/ WJ IV ACH - Passage Comprehension				103			
Reading Fluency							
GORT-5 - Rate				(9)			
GORT-5 - Fluency				(8)			

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Mathematical Calculations							
WIAT-III - Numerical Operations				103			
WJ III ACH NU/ WJ IV ACH - Calculations				99			
Mathematical Reasoning							
WIAT-III - Math Problem Solving		78					
WJ III ACH NU/ WJ IV ACH - Applied Problems		75					

Case Study #1:
Male Age 10-4 yrs. 4th Grader

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Written Expression							
KTEA-II - Written Expression				105			
WIAT-III - Written Expression				101			
Listening Comprehension							
KTEA-II - Listening Comprehension				108			
WJ III ACH NU - Oral Comprehension				105			
Oral Expression							
KABC-II - Expressive Vocabulary				(10)			
WIAT-III - Oral Expression (Expressive Vocabulary)				104			

Case Study #1: What Did Respondents Say?

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Mathematical Reasoning							
WIAT-III - Math Problem Solving		78					
WJ III ACH NU/ WJ IV ACH - Applied Problems		75					

88.9% (16/18) of the respondents agree this child has a SLD in the area of math reasoning.

Case Study #1: What Did Respondents Say?

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Fluid Reasoning (*Gf*)							
WISC-IV/V - Matrix Reasoning		(5)					
WJ III COG NU/ WJ IV COG - Concept Formation		78					

88.9% (16/18) of the respondents agree this child has a concurrent fluid reasoning deficit.

Case Study #1: What Did Respondents Say?

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Executive Functions (*Gh*)							
KABC-II - Rover			(7)				
WJ III COG NU/ WJ IV COG - Analysis/Synthesis			89				

55.6% (10/18) of the respondents incorrectly identified a concurrent executive functions deficit.

Case Study #1: What Did Respondents Say?

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Executive Functions (Gh)							
KABC-II - Rover			(7)				
WJ III COG NU/ WJ IV COG - Analysis/Synthesis			89				

A scaled score with a mean of 10 and a standard deviation of 3 means that the obtained score of 7 is at the bottom of the average range. A standard score (mean = 100, SD =15) so 89 is still average as well.

Phase I Results

Case	Correctly Identified Achievement Deficit Area(s)	Correctly Identified Processing Deficit	SLD?
1	Math Reasoning (100%)	Fluid Reasoning (88.9%)	Yes: 88.9%
2	Reading Decoding (94.4%) Listening Comprehension (72.2%)	Auditory Processing (100%)	Yes: 72.2%
3	Gifted with average achievement		No: 88.9%
4	Reading Decoding (72.2%) Math Calculations (83.3%)	Long-Term Memory (83.3%)	Yes: 88.9%
5	Reading Fluency (88.8%) Oral Expression (88.8%)	Processing Speed (94.4%)	Yes: 72.2%
6	Low average cognitive abilities and academic achievement		No: 94.4%
7	Math Calculations (94.4%)	Visual-Spatial Processing (94.4%)	Yes: 72.2%
8	Math Reasoning (88.8%) Written Expression (88.8%)	Short-term Memory (88.8%)	Yes: 88.8%

Phase I Results

Case	Correctly Identified Achievement Deficit Area(s)	Correctly Identified Processing Deficit	SLD?
9	Intellectually Disabled - No SLD		No: 88.9%
10	Reading Comprehension (100%) Listening Comprehension (100%)	Attention Problems (100%)	Yes: 61.1%
11	Written Expression (94.4%)	Executive Functions (100%)	Yes: 77.7%

Case Study #10 was removed from any further analyses due to the low agreement rate of the presence of a SLD. Probably thought the student had ADHD not SLD.

Presentation Outline

- Methods of SLD Identification
- Purpose of research study
- Phase I of Study: Clinical vignettes
- Phase II of Study: Apply Cases to PSW Models
- Research Results

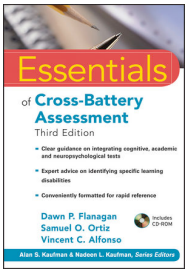
Phase II Research Study

- Three case study examples of a single achievement deficit along with a single cognitive processing deficit (SLD present).
- Four case study examples of dual achievement deficits along with a single cognitive processing deficit (SLD present).
- Three case study examples where there is no SLD (Control Cases).

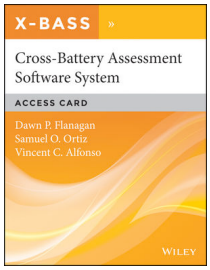
Three Methods of SLD Identification Using a Process Approach

1. Cross-Battery Assessment Software System (X-BASS: Ortiz, Flanagan, & Alfonso, 2015),
2. Concordance-Discordance Model of SLD identification (Hale & Fiorello, 2004; Hale, Wycoff, & Fiorello, 2010) and,
3. Psychological Processing Analyzer v3.1 (Dehn, 2015).

Cross-Battery Assessment (XBA) Pattern of Strengths and Weaknesses



Publication Date: 2013

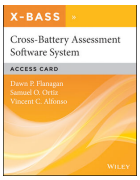


Publication Date: 2015

Cross-Battery Assessment Software System (X-BASS)

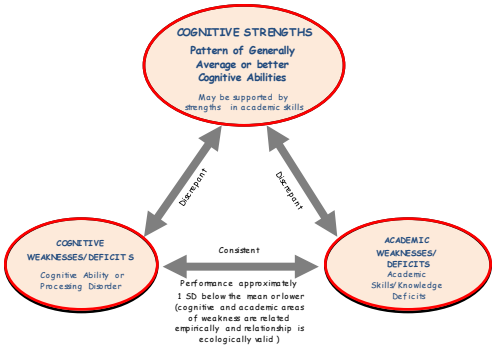
An automated Cross-Battery data management program with fully integrated, single data-entry management across all modules:

1. XBA Analyzer
2. Processing Strengths and Weaknesses Analyzer (PSW-A)
3. Culture-Language Interpretative Matrix (C-LIM)



Ortiz, Flanagan, & Alfonso, 2015

Flanagan et al.'s Dual Discrepancy/Consistency Operational Definition of SLD: *Pattern of Strengths and Weaknesses Consistent with SLD*

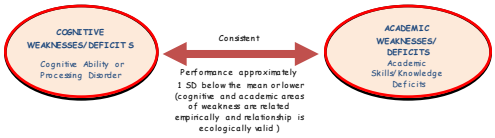


In D. P. Flanagan & V. C. Alfonso, ***Essentials of Specific Learning Disability Identification***. Hoboken, NJ: Wiley; Flanagan, Fiorello, and Ortiz (2010); Hale, Flanagan, and Naglieri (2008)

Flanagan et al.'s Dual Discrepancy/Consistency Operational Definition of SLD: *Pattern of Strengths and Weaknesses Consistent with SLD*

Cognitive and Academic Deficits:

- The two bottom ovals depict academic and cognitive weaknesses, and their horizontal alignment indicates that the level of performance in both domains (academic and cognitive) is expected to be similar or consistent.
- The bi-directional arrow between the two ovals indicates that the difference between measured performances in the weak academic areas(s) is/are not significantly different from performance in the weak cognitive area(s).

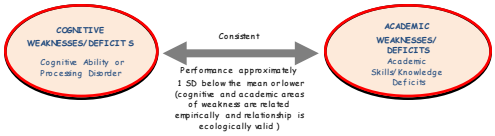


In D. P. Flanagan & V. C. Alfonso, ***Essentials of Specific Learning Disability Identification***. Hoboken, NJ: Wiley; Flanagan, Fiorello, and Ortiz (2010); Hale, Flanagan, and Naglieri (2008)

X-BASS Cognitive Weakness – Academic Weakness Comparison

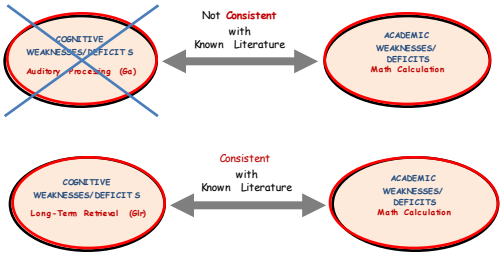
The cognitive weakness – academic weakness comparison, does not include the criterion of a non-significant difference between these two scores. Rather, the X-BASS approach refers to this as consistency.

Consistency refers to the fact that an empirical or ecologically valid relationship exists between the areas of identified cognitive and academic weaknesses, but not necessarily a non-significant difference between these areas.



Flanagan, Ortiz, & Alfonso (2013). ***Essentials of Cross-Battery Assessment – Third Edition***

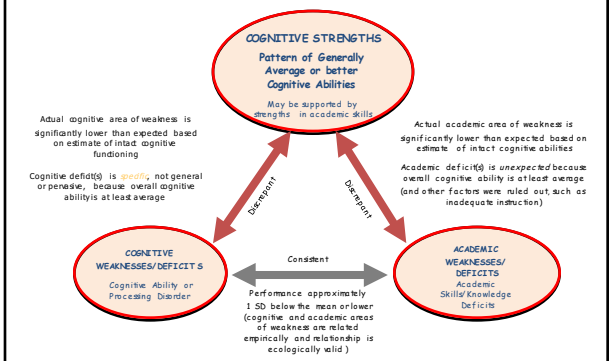
X-BASS Cognitive Weakness – Academic Weakness Comparison



One of the major advantages of the X-BASS software is that the program will identify the research-based cognitive aptitude – achievement relationships for the user.

Flanagan, Ortiz, & Alfonso (2013). ***Essentials of Cross-Battery Assessment – Third Edition***

Flanagan et al.'s Dual Discrepancy/Consistency Operational Definition of SLD: *Pattern of Strengths and Weaknesses Consistent with SLD*



In D. P. Flanagan & V. C. Alfonso, *Essentials of Specific Learning Disability Identification*. Hoboken, NJ: Wiley; Flanagan, Fiorello, and Ortiz (2010); Hale, Flanagan, and Naglieri (2008)

Case Study #1: What Did Respondents Say?

Instrument- Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Fluid Reasoning (*Gf*)							
WISC-IV/V - Matrix Reasoning		(5)					
WJ III COG NU/ WJ IV COG - Concept Formation		78					

88.9% (16/18) of the respondents agree this child has a concurrent fluid reasoning deficit.

X-BASS Software (v1.0)

Software combines more than one subtest across batteries or within batteries that all load on one CHC ability into a single score.

FLUID REASONING (Gf)	Enter scores below	Converted Standard Score	Composite Score Analyses
WISC-IV Matrix Reasoning (Gf:I)	5	75	A
WJ III NU COG Concept Formation (Gf:I)	78	78	A
		Comp A	Comp B
Clear Gf Data	Composite Standard Score(s):	73	
	Composite Percentile Rank(s):	4	

Score configuration and interpretation:

The difference between the scores that comprise the composite is less than 1SD and, therefore, the composite is considered cohesive. The composite is likely a good summary of the set of theoretically related abilities that comprise it. Interpret the composite as an adequate estimate of the ability that it is intended to measure.

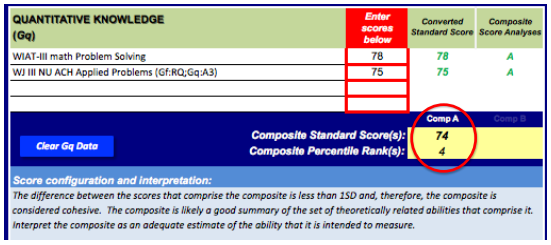
Case Study #1: What Did Respondents Say?

Instrument: Subtest	Well Below Expected	Below Expected	Slightly Below Expected	At Expected	Above Expected	Well Above Expected	Superior
Mathematical Reasoning							
WIAT-III - Math Problem Solving		78					
WJ III ACH NU/ WJ IV ACH - Applied Problems		75					

88.9% (16/18) of the respondents agree this child has a SLD in the area of math reasoning.

DMIA v2.0 Software

Software combines more than one subtest across batteries or within batteries that all load on one CHC ability into a single score.



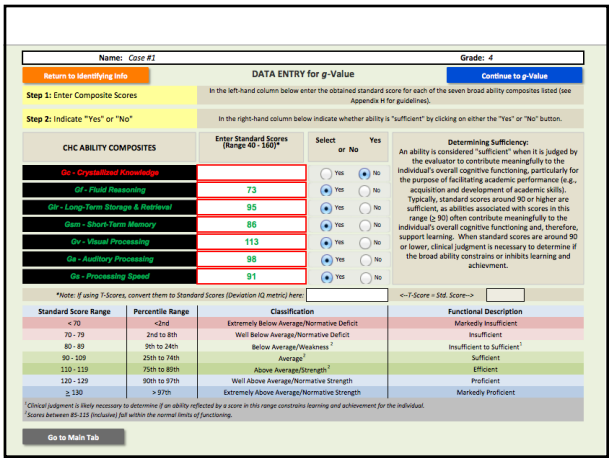
QUANTITATIVE KNOWLEDGE (Gq)	Enter scores below	Converted Standard Score	Composite Score Analyses
WIAT-III math Problem Solving	78	78	A
WJ III NU ACH Applied Problems (Gf:RQ;Gq:A3)	75	75	A

Clear Gq Data

	Comp A	Comp B
Composite Standard Score(s):	74	
Composite Percentile Rank(s):	4	

Score configuration and interpretation:

The difference between the scores that comprise the composite is less than 1SD and, therefore, the composite is considered cohesive. The composite is likely a good summary of the set of theoretically related abilities that comprise it. Interpret the composite as an adequate estimate of the ability that it is intended to measure.



Name: *Case #1* Grade: 4

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		Yes / No
Gf - Fluid Reasoning	73	Yes / No
Glr - Long-Term Storage & Retrieval	95	Yes / No
Gsm - Short-Term Memory	86	Yes / No
Gv - Visual Processing	113	Yes / No
Ga - Auditory Processing	98	Yes / No
Gs - Processing Speed	91	Yes / No

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.

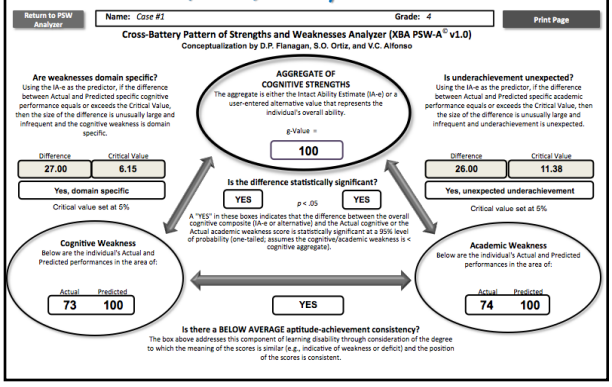
*Note: If using T-Scores, convert them to Standard Scores (Deviation IQ metric) here: <--T-Score = Std. Score-->

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 [2]	Insufficient to Sufficient[1]
90 - 109	25th to 74th	Average[2]	Sufficient
110 - 119	75th to 89th	Above Average/Strength[2]	Efficient
120 - 129	90th to 97th	Well Above Average/Normative Strength	Proficient
≥ 130	> 97th	Extremely Above Average/Normative Strength	Markedly Proficient

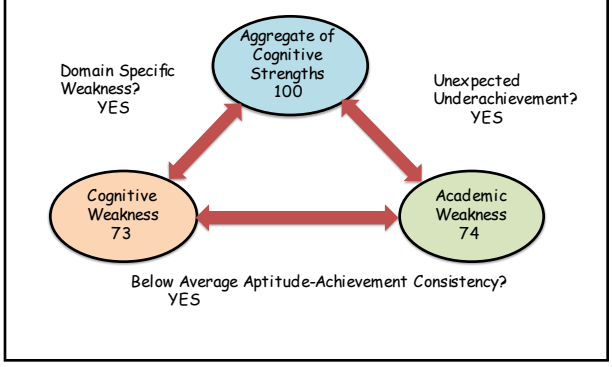
[1] *Clinical judgment is likely necessary to determine if an ability reflected by a score in this range constrains learning and achievement for the individual.*
[2] *Scores between 85-115 (inclusive) fall within the normal limits of functioning.*

Go to Main Tab

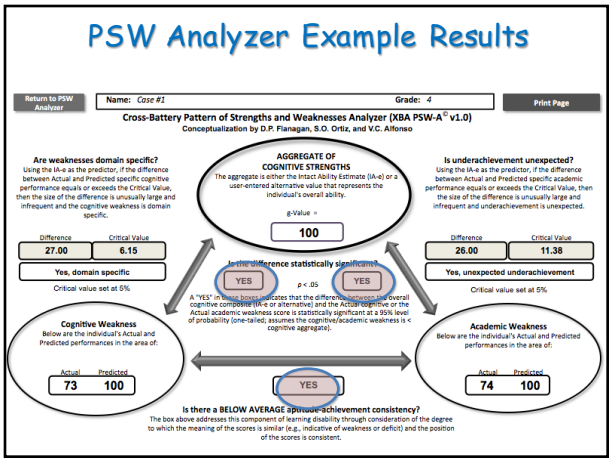
XBA Pattern of Strengths and Weaknesses (PSW) Analyzer v1.0



PSW Analyzer Example Results



PSW Analyzer Example Results



Evaluation of the XBA Approach to SLD Identification

- **XBA DMIA software:**
  - Very inclusive list of major tests of cognitive and academic achievement.
  - Psychometrically sound in how composite scores are derived for input into the PSW software.
  - Need to consider all 8 areas of SLD qualification (e.g., separate reading fluency from other reading skills, add oral language and listening comprehension).
  - Nice graphing features and suggestions for additional testing in CHC domains as needed.

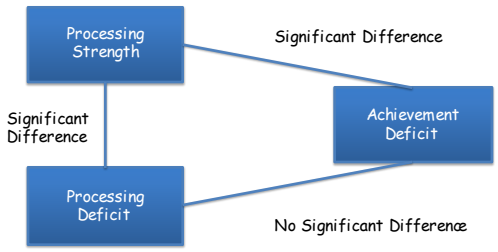
Evaluation of the XBA Approach to SLD Identification

- **XBA PSW Software:**
  - Psychometrically sound methods for determining processing and academic deficits.
  - Requires user to enter all permeations of cognitive and academic deficits one at a time into the PSW Analyzer. So if working memory is a cognitive deficit it may have detrimental effects of more than one academic area – requires more than one pass through the software program.
  - Excellent graphics, narrative, and supplemental resources produced by the software.

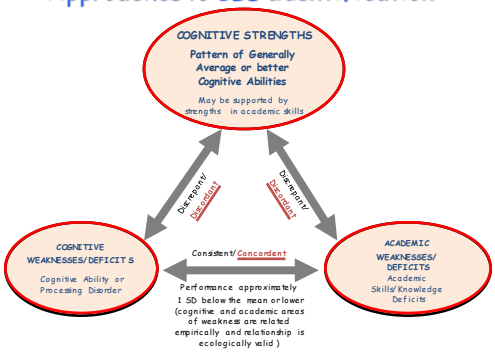
Three Methods of SLD Identification Using a Process Approach

1. Cross-Battery Assessment Software System (X-BASS: Ortiz, Flanagan, & Alfonso, 2015),
2. Concordance-Discordance Model of SLD identification (Hale & Fiorello, 2004; Hale, Wycoff, & Fiorello, 2011) and,
3. Psychological Processing Analyzer v3.1 (Dehn, 2015).

The Concordance-Discordance Model of SLD Identification (Hale & Fiorello, 2004)



Common Components of Third-Method Approaches to SLD Identification



In D. P. Flanagan & V. C. Alfonso, ***Essentials of Specific Learning Disability Identification***. Hoboken, NJ: Wiley; Flanagan, Fiorello, and Ortiz (2011); Hale, Flanagan, and Naglieri (2008)

C-DM Approach

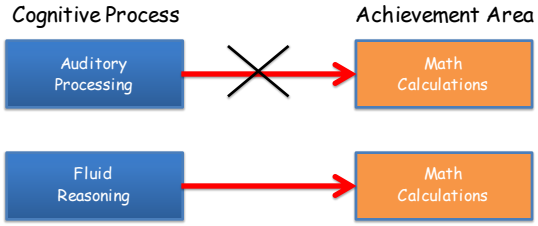
The null hypothesis that there is no difference between the cognitive strength and cognitive deficit, or the cognitive strength and achievement deficit, is tested using the relatively straight-forward standard error of difference (SED) formula.

$$\text{SED} = \text{SD}\sqrt{2 - rxx - ryy}$$

C-DM Approach

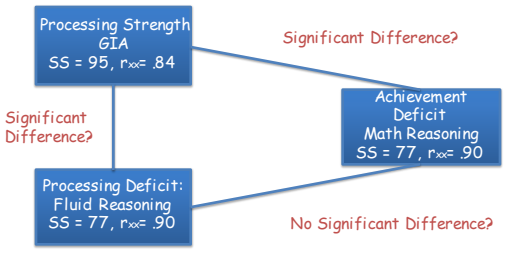
- Taking just the highest and lowest cognitive score and the lowest achievement score to determine significant (discordance) or non significant (concordance) differences is not appropriate.
- The C-DM approach requires the practitioner to be aware of what cognitive processes are empirically related to which academic achievement areas.

Deficits in Cognitive Processes and Related Academic Achievement Deficits



User needs to know the neuropsychological and cognitive processing literature to accurately predict cognitive – academic achievement relationships. Cognitive weaknesses could be chosen by the user which have no predictive relationship with the academic area – this could pose a problem.

Concordance-Discordance Model Example: Case Study #1



Concordance-Discordance Model Example: Case Study #1

SED = SD $\sqrt{2 - r_{xx} - r_{yy}}$

SED = 15 $\sqrt{2 - .84 - .91}$

SED = (6.71) X 2.58 = 17.31→**17**

GIA SS = 95; FR SS = 77, so 95 - 77 = **18**

Obtained Diff (18) > Critical Diff (17)?

→YES! Significant Difference

Processing Strength
GIA
SS = 95, r_{xx}= .84

Achievement Deficit
Math Reasoning
SS = 77, r_{xx}= .91

Processing Deficit:
Fluid Reasoning
SS = 77, r_{xx}= .90

Concordance-Discordance Model Example: Case Study #1

Processing Strength
GIA
SS = 95, r_{xx}= .84

Processing Deficit:
Fluid Reasoning
SS = 77, r_{xx}= .90

SED = SD $\sqrt{2 - r_{xx} - r_{yy}}$

SED = 15 $\sqrt{2 - .84 - .90}$

SED = (7.69) X 2.58 = 19.83→**20**

GIA SS = 95; PR SS = 77, so 95 - 77 = **18**

Obtained Diff (18) < Critical Diff (20)?

→NO! Significant Difference

Should normally be YES for SLD identification.

Concordance-Discordance Model Example: Case Study #1

SED = SD $\sqrt{2 - r_{xx} - r_{yy}}$

SED = 15 $\sqrt{2 - .90 - .90}$

SED = (6.71) X 2.58 = 17.31→**17**

FR SS = 77; MR SS = 77, so 77 - 77 = **0**

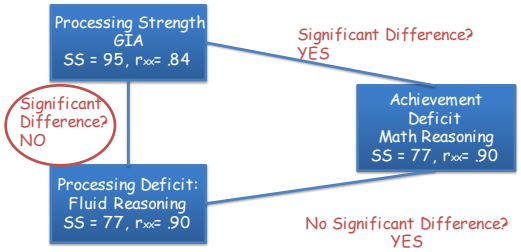
Obtained Diff (0) < Critical Diff (17)?

→NO Significant Difference

Achievement Deficit
Math Reasoning
SS = 77, r_{xx}= .90

Processing Deficit:
Fluid Reasoning
SS = 77, r_{xx}= .90

Concordance-Discordance Model Example: Case Study #1



If there are no exclusionary causes present for this student, the diagnosis of SLD would not be met using the C-DM Model.

Three Methods of SLD Identification Using a Process Approach

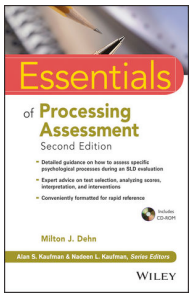
1. Cross-Battery Assessment Software System (X-BASS: Ortiz, Flanagan, & Alfonso, 2015),
2. Concordance-Discordance Model of SLD identification (Hale & Fiorello, 2004; Hale, Wycoff, & Fiorello, 2010) and,
3. Psychological Processing Analyzer v3.1 (Dehn, 2015).

Psychological Processing Analyzer 3.1 (Dehn, 2015)

- The Psychological Processing Analyzer (PPA) 3.1 identifies statistically significant strengths and weaknesses among psychological processes and academic skills, and then compares psychological processes with closely related academic skills.
- The primary purpose of the PPA is to assist the professional user with the analysis of test scores that have been obtained during selective, multi-battery testing.

Psychological Processing Analyzer 3.1 (Dehn, 2015)

The rationale and procedures for a selective, multi-battery approach to conducting an assessment of psychological processes can be found in Dehn's (2014) *Essentials of Processing Assessment, Second Edition*.



Dehn's Model of SLD Identification

According to Dehn's (2014)PSW model, psychological processing assessment data supports the diagnosis of an SLD when all of the following occur:

1. At least one psychological process is identified as an intra-individual weaknesses or a deficit.
2. The intra-individual weakness should be statistically significant.
3. Intra-individual weaknesses without unitary subtest scores should not be used to diagnose a disability.
4. There is at least one intra-individual strength. Ideally, the strength should be statistically significant, but a processing score within the average range may be considered a strength.
5. The processing intra-individual weakness or deficit must have a strong research-based relation with the deficient academic skill being considered for SLD.
6. There should be consistency between the process score(s) of the intra-individual weakness or deficit and the related academic deficiency score. That is, they should both be low scores, or the process score should be lower than the related achievement score.

Processes Included in Dehn's PPA Approach

- The PPA includes 11 psychological processes that are important for academic learning.
- "Psychological processes" are mental (neuropsychological) operations that perceive, transform, manipulate, store, retrieve, and express information.
- In regards to learning academic skills, these psychological processes should be thought of as *aptitudes*.

- Attention (AT)
- Auditory Processing (AP)
- Executive Functions (EF)
- Fine Motor (FM)
- Fluid Reasoning (FR)
- Long-Term Recall (LTR)
- Oral Language (OL)
- Phonological Processing (PP)
- Processing Speed (PS)
- Visual-Spatial Processing (VSP)
- Working Memory (WM)

Academic Skills Included in the PPA Approach

- Basic Reading Skills
- Reading Fluency
- Reading Comprehension
- Mathematics Calculation
- Mathematics Problem Solving
- Written Expression
- Oral Expression
- Listening Comprehension

- The PPA 3.0 includes the eight areas of achievement (academic skills) listed as SLD categories in federal and state criteria.

Psychological Processing Analyzer 3.1 (Dehn, 2015)

- The PPA Version 3.1 includes psychological processing composites and subtests from 44 intellectual, cognitive, and achievement scales, as well as, rating scales and measures designed to measure specific processes.
- The measures mostly cover the school-age range of 6 to 18 years of age and have been published since 1998.
- Not all composites and subtests from any given battery or scale are available on the PPA. Only composites and subtests judged to be fairly direct measures of psychological processes are included (Dehn, 2014).

Psychological Processing Analyzer 3.1 (Dehn, 2015)

⚠ CAUTION ⚠ CAUTION

- We disagree with Dr. Dehn's inclusion of behavioral rating scales (e.g., BRIEF, CEFI, D-REF, Conners 3, & CPPS) as measures of processing deficits.
- As an example, a parent's or teacher's rating of a child's working memory skills is not always equivalent to actual behavioral samples of working memory.
- It would be inappropriate in our opinion to identify processing deficits consistent with a SLD diagnosis on the basis on a behavioral rating scale.

Psychological Processing Analyzer 3.1 (Dehn, 2015)

- Measures of crystallized intelligence are excluded because they are the product of processing, rather than fairly direct measures of processing. Also, crystallized intelligence consists of acquired knowledge and thus can be considered a form of achievement (Kaufmann & Kaufman, 1983).

This makes sense, but is not addressed in the other 3rd method of SLD identification models.

Psychological Processing Analyzer 3.1 (Dehn, 2015)

- Dehn (2013) identified the major pairwise comparisons between cognitive processing and academic achievement based on current neuropsychology/neurocognitive literature.
- For example, the strong relationship between phonological processing and basic reading skills should lead the evaluator to hypothesize that a phonological processing deficit accounts for reported reading difficulties.
- See next two slides for the cognitive processes – academic achievement relationships.

Process	Basic Reading Skills	Reading Fluency	Reading Comprehension	Math Calculation	Math Reasoning
Attention	X	X	X	X	X
Auditory Processing	X		X		
Executive Functioning			X		X
Fluid Reasoning			X	X	X
Long-Term Retrieval	X	X	X	X	X
Oral Language	X		X		X
Phonological Processing	X	X			
Processing Speed	X	X		X	X
Visual-Spatial Processing				X	
Working Memory	X		X	X	X

Process	Written Expression	Oral Expression	Listening Comprehension
Attention	X	X	X
Auditory Processing	X		X
Executive Functioning	X	X	x
Fluid Reasoning	X		
Long-Term Retrieval	X	X	
Oral Language	X	X	X
Phonological Processing	X	X	X
Processing Speed	X	X	X
Visual-Spatial Processing			
Working Memory	X	X	X

Dehn, 2015

Differences Between Dehn's and X-BASS Approach to SLD Identification

- CHC has limitations as an SLD diagnostic model because it does not include some important abilities that are needed for the acquisition and performance of academic skills. Such omissions by the CHC cross-battery approach include attention, fine motor, oral language, and phonological processing.
- Dehn's model emphasizes psychological and cognitive processes that are highly related with academic learning, regardless of whether they are classified as narrow or broad abilities by CHC theory.

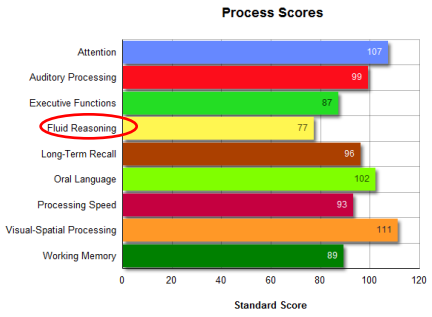
Differences Between Dehn's and X-BASS Approach to SLD Identification

1. Dehn's includes standardized rating scales.
2. Dehn's emphasizes the use of composite scores over subtest scores.
3. Dehn classifies some composites and subtests differently from the reported structure of the test, and
4. Achievement-like factors, such as crystallized intelligence, are not considered direct measures of processing and are therefore excluded from the analysis.

Evaluation of Psychological Processing Analyzer 3.1 (Dehn, 2015)

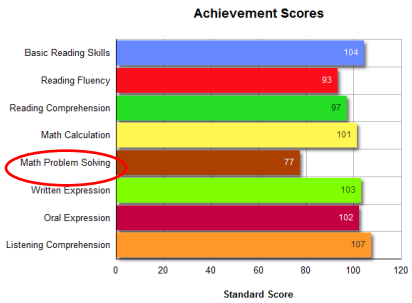
- Forced entry of process scores for a limited number of tests.
- Does not allow for entry of tests not in pull down menus. This limits the utility of the software program.
- A user can "trick" the software by choosing a test name then entering in their own data from another source but this is not idea.

PPA 3.1 Case Study #1 Example



The program does provide in tabular and graph format the ipsitative strengths and weaknesses of the cognitive processing scores.

PPA 3.1 Case Study #1 Example



The program does provide in tabular and graph format the ipsitative strengths and weaknesses of the achievement scores.

PPA 3.1 Case Study #1 Example

Fluid Reasoning	Score	Process Score	Predicted Score	Diff	Ind. S/W	Norm S/W	Asset/ Deficit
- WISC-V Matrix Reasoning - WJ IV Concept Formation	75 78	77	98	-21	W	W	D
Math Reasoning							
- WIAT III Math Prob Solving - WJ IV Applied Problems	78 75	77	101	-24	W	W	D

PPA 3.1 Case Study #1 Example

Significant .01 Pairwise Comparison of Process Scores

	Process 1 Score	Process 2 Score	Difference	Critical Value (.01 Level)	Significant Difference
Attention vs Auditory Processing	107	99	8	17.31	No
Attention vs Executive Functioning	107	87	20	19.35	Yes
Attention vs Processing Speed	107	93	14	16.42	No
Auditory Processing vs Phonological Processing					
Auditory Processing vs Visual-Spatial Processing	99	111	12	15.96	No
Executive Functioning vs Fluid Reasoning	87	77	10	16.87	No
Executive Functioning vs Long-Term Recall	87	96	9	18	No
Fine Motor vs Visual-Spatial Processing					
Oral Language vs Auditory Processing	102	99	3	13.95	No
Oral Language vs Long-Term Recall	102	96	6	13.41	No
Oral Language vs Phonological Processing					
Processing Speed vs Fine Motor					
Working Memory vs Attention	89	107	18	17.31	Yes
Working Memory vs Executive Functioning	89	87	2	18.56	No
Working Memory vs Fluid Reasoning	89	77	12	14.48	No
Working Memory vs Long Term Recall	89	96	7	15.96	No
Working Memory vs Oral Language	89	102	13	13.95	No
Working Memory vs Phonological Processing					
Working Memory vs Processing Speed	89	93	4	15.48	No

- Intra-Process comparisons only.
- Does not allow for FSIQ – cognitive weakness comparisons.
- Does not identify fluid reasoning as a processing deficit.

PPA 3.1 Case Study #1 Example:

Consistency Between Psychological Processes and Academic Skills

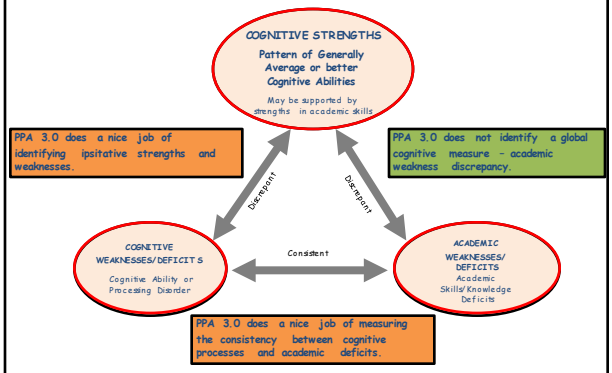
	Ach. Score	Process Score	Diff.	Critical Value (.05 Level)	Significant Difference
Basic Reading Skills vs Auditory Processing	104	99	5	11	No
Basic Reading Skills vs Long-Term Recall	104	96	8	10.8	No
Basic Reading Skills vs Oral Language	104	102	2	8.82	No
Basic Reading Skills vs Phonological Processing	104				
Basic Reading Skills vs Processing Speed	104	93	11	10.18	Yes
Basic Reading Skills vs Working Memory	104	89	15	11	Yes
Reading Fluency vs Long-Term Recall	93	96	3	10.18	No
Reading Fluency vs Phonological Processing	93				
Reading Fluency vs Processing Speed	93	93	0	9.75	No
Reading Comprehension vs Auditory Processing	97	99	2	12.12	No
Reading Comprehension vs Executive Functions	97	87	10	13.79	No
Reading Comprehension vs Fluid Reasoning	97	77	20	10.8	Yes
Reading Comprehension vs Long-Term Recall	97	96	1	11.76	No
Reading Comprehension vs Oral Language	97	102	5	10.18	No
Reading Comprehension vs Working Memory	97	89	8	12.12	No
Mathematics Calculation vs Attention	101	107	6	13.15	No
Mathematics Calculation vs Fluid Reasoning	101	77	24	11	Yes
Mathematics Calculation vs Long-Term Recall	101	96	5	12.12	No
Mathematics Calculation vs Processing Speed	101	93	8	11.76	No
Mathematics Calculation vs Visual-Spatial Processing	101	111	10	12.12	No
Mathematics Calculation vs Working Memory	101	89	12	12.47	No
Mathematics Problem Solving vs Executive Functions	77	87	10	14.1	No
Mathematics Problem Solving vs Fluid Reasoning	77	77	0	11	No
Mathematics Problem Solving vs Long-Term Recall	77	96	19	12.12	Yes

This report is intended to be used to aid in SLD diagnosis.

PPA 3.1 Case Study #1 Example:
Consistency Between Psychological Processes and Academic Skills

	Ach. Score	Process Score	Diff.	Critical Value (.05 Level)	Significant Difference
Mathematics Problem Solving vs Oral Language	77	102	25	10.8	Yes
Mathematics Problem Solving vs Processing Speed	77	93	16	11.76	Yes
Mathematics Problem Solving vs Working Memory	77	89	12	12.47	No
Written Expression vs Auditory Processing	103	99	4	12.47	No
Written Expression vs Executive Functions	103	87	16	14.1	Yes
Written Expression vs Fine Motor	103				
Written Expression vs Fluid Reasoning	103	77	26	11.75	Yes
Written Expression vs Long-Term Recall	103	96	7	13.36	No
Written Expression vs Oral Language	103	102	1	12.04	No
Written Expression vs Phonological Processing	103				
Written Expression vs Processing Speed	103	93	10	14.16	No
Written Expression vs Working Memory	103	89	14	15.44	No
Oral Expression vs Executive Functions	102	87	15	17.54	No
Oral Expression vs Long-Term Recall	102	96	6	15.36	No
Oral Expression vs Oral Language	102	102	0	13.65	No
Oral Expression vs Phonological Processing	102				
Oral Expression vs Processing Speed	102	93	9	16.03	No
Oral Expression vs Working Memory	102	89	13	17.48	No
Listening Comprehension vs Auditory Processing	107	99	8	17.36	No
Listening Comprehension vs Executive Functions	107	87	20	20.35	No
Listening Comprehension vs Oral Language	107	102	5	15.06	No
Listening Comprehension vs Phonological Processing	107				
Listening Comprehension vs Processing Speed	107	93	14	17.74	No
Listening Comprehension vs Working Memory	107	89	18	19.36	No

Psychological Processing Analyzer 3.1 (Dehn, 2015)



Utility of the PPA 3.1

- Due to the inability of the PPA 3.1 software to identify the discrepancy between an overall measure of cognitive ability and an academic weakness, the third method of SLD identification is not possible.
- Relies on composite scores not individual subtest scores.
- This severely limits the clinical utility of the software. Good at identifying broad based strengths and weaknesses but not SLD.

Presentation Outline

- Methods of SLD Identification
- Purpose of research study
- Phase I of Study: Clinical vignettes
- Phase II of Study: Apply Cases to PSW Models
- Research Results

COMPARISION OF SLD IDENTIFICATION ACROSS MODELS

Phase II of SLD Research Study

Due to the limitations of the PPA 3.1 software, only the Concordance – Discordance Model and the XBA models of SLD identification were evaluated for the final SLD diagnosis.

What Cognitive Processes are Included in the Three Models?

Comparison of the Three 3rd Method Approaches

Cognitive Processes	X-BASS	C-DM	PPA
• Auditory Processing (*Ga*)	X	X	X
• Executive Functions	X	X	X
• Fluid Reasoning	X	X	X
• Long-Term Recall / Storage and Retrieval (*Glr*)	X	X	X
• Processing Speed (*Gs*)	X	X	X
• Visual-Spatial Processing (Visual Processing (*Gv*)	X	X	X
• Working Memory / Short-Term Memory (*Gsm*)	X	X	X
• Fluid Reasoning (*Gf*)	X	X	
• Crystallized Intelligence (*Gc*)	X	X	
• Domain-Specific Knowledge (*Gkn*)	X	X	
• Orthographic Processing	X	X	
• Speed of Lexical Access	X	X	
• Cognitive Efficiency	X	X	
• Attention		X	X
• Fine Motor		X	X
• Oral Language		X	X
• Phonological Processing		X	X

What Academic Achievement Areas are Included in the Three Models?

Comparison of the Three 3rd Method Approaches

Areas of Academic Achievement	X-BASS	C-DM	PPA
• Basic Reading Skills	X	X	X
• Reading Comprehension	X	X	X
• Reading Fluency	X	X	X
• Written Expression	X	X	X
• Mathematical Calculation	X	X	X
• Math Problem Solving	X	X	X
• Oral Expression	X	X	X
• Listening Comprehension	X	X	X

Phase II Results

Case	Cog. Deficit	Acad. Deficit	SLD Experts	X-BASS			C-DM			PPA 3.1		
				1	2	3	1	2	3	1	2	3
1	*Gf*	Math Reasoning	88.9% Yes	Y	Y	N	N	Y	N	Y	n/a	N
2a	*Ga*	Reading Decoding	72.2% Yes	Y	Y	N	Y	Y	N	Y	n/a	N
2b	*Ga*	Listening Compreh.	72.2% Yes	Y	Y	N	Y	N	N	Y	n/a	N
4a	*Glr*	Reading Decoding	88.9% Yes	Y	Y	N	Y	Y	N	Y	n/a	N
4b	*Glr*	Math Calc.	88.9% Yes	Y	Y	N	Y	Y	N	Y	n/a	N
5a	*Gs*	Reading Fluency	72.2% Yes	Y	Y	N	N	N	N	Y	n/a	N
5b	*Gs*	Oral Express.	72.2% Yes	Y	Y	N	N	N	N	Y	n/a	N

Where:
1 = Cognitive Strength vs. Cognitive Weakness (for SLD Diagnosis should be Yes)
2 = Cognitive Strength vs. Academic Weakness (for SLD Diagnosis should be Yes)
3 = Cognitive Weakness vs. Academic Weakness (for SLD Diagnosis should be No)

Phase II Results

Case	Cog. Deficit	Acad. Deficit	SLD Experts	X-BASS			C-DM			PPA 3.1		
				1	2	3	1	2	3	1	2	3
7	*Gv*	Math Calcul.	72.2% Yes	Y	Y	N	N	Y	N	Y	n/a	N
8a	*Gwm*	Math Reason.	88.8% Yes	Y	Y	N	Y	Y	N	Y	n/a	N
8b	*Gwm*	Written Express.	88.8% Yes	Y	Y	N	Y	Y	N	Y	n/a	N
11	*EF*	Written Express.	77.7% Yes	Y	Y	N	Y	Y	N	Y	n/a	N

Where:
1 = Cognitive Strength vs. Cognitive Weakness (for SLD Diagnosis should be Yes)
2 = Cognitive Strength vs. Academic Weakness (for SLD Diagnosis should be Yes)
3 = Cognitive Weakness vs. Academic Weakness (for SLD Diagnosis should be No)

Phase II Results

Case	Cog. Deficit	Acad. Deficit	SLD Experts	X-BASS			C-DM			PPA 3.1		
				1	2	3	1	2	3	1	2	3
3	Gifted - low achievement		No	N	N	N	N	Y	N	N	n/a	N
6	Low abilities	& achievement	No	N	N	N	N	N	N	N	n/a	N
9	Intellectually Disabled		No	N	N	N	N	N	N	N	n/a	N

Where:
1 = Cognitive Strength vs. Cognitive Weakness (for SLD Diagnosis should be No)
2 = Cognitive Strength vs. Academic Weakness (for SLD Diagnosis should be No)
3 = Cognitive Weakness vs. Academic Weakness (for SLD Diagnosis should be No)

Overall Results

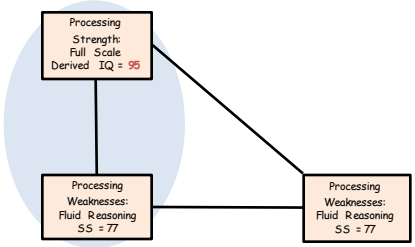
- The X-BASS (Flanagan et al., 2015) approach had a 100% agreement with the expert panel in the identification of SLD and the identification of non-SLD.
- The X-BASS requires some level of training and expertise to make sure it is being used properly, but it is conceptualized and operationalized well and yields the best results of the three approaches.

Overall Results

- The Concordance-Discordance Model (C-DM) was more conservative in the identification of SLD.
  - This model only identified 54% of the expert-identified SLD cases.
  - The differences had to do with the calculations of cognitive strengths and weaknesses and academic weakness comparisons. Differences were due to the lower reliability of some of the measures used for the cognitive weaknesses.

Overall Results

The Concordance-Discordance Model (C-DM):

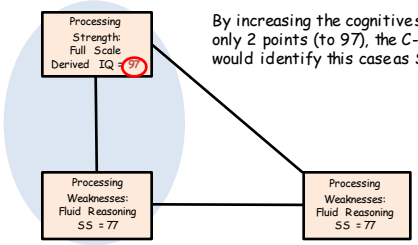


Cognitive Strength vs. Cognitive Weakness: (18 point difference):

- Most practitioners would suggest this would be a significant difference due to a greater than 1 SD difference.
- However, when the reliabilities of the tests used to derived the cognitive weaknesses are accounted for the difference is not significant.

Overall Results

The Concordance-Discordance Model (C-DM):



By increasing the cognitive strength by only 2 points (to 97), the C-DM model would identify this case as SLD.

Cognitive Strength vs. Cognitive Weakness:

- The poorer the reliability of the cognitive weaknesses, the bigger the difference required between the cognitive strength and weakness in order to achieve statistical significance.

Overall Results

Psychological Processing Analyzer 3.1 (Dehn, 2015):

- In Dehn's (2014) PSW model any process score in the average range (a standard score of 90 or above) can be considered a strength for PSW diagnostic purposes.
- As seen in Hale et al.'s C-DM Model, cognitive strengths as defined by standard scores in the low 90's, may not be strong enough to warrant a statistical significant difference between that score and a cognitive weakness.

The Difference Lies Under the Hood

- The PPA does not analyze the cognitive strength – academic weakness discrepancy.
- The PPA relies on composite scores only.
- The PPA is more inclusive of what constitutes a cognitive process.

The Difference Lies Under the Hood

- The C-DM allows the user to enter any score, but relies on the expertise of the examiner to know the neurocognitive literature – usually a big assumption.
- The most conservative approach to SLD identification.

The Difference Lies Under the Hood

- The X-BASS is the most reliable 3rd method of SLD diagnosis and the most sophisticated.
- X-BASS users will require some advanced training to ensure that the program is being used appropriately.

References

- Dehn, M. (2015a). *Psychological Processing Analyzer 3.0 Professional Manual.* Stoddard, WI: Schoolhouse Educational Services, LLC.
- Dehn, M. (2015b). *Psychological Processing Analyzer 3.1.* Stoddard, WI: Schoolhouse Educational Services, LLC.
- Dehn, M. J. (2014). *Essentials of processing assessment – Second Edition.* Hoboken, NJ: Wiley.
- Flanagan, D. P., Ortiz, S. O., & Alfonso, V. C. (2015). *Cross-Battery Assessment Software System* (X-BASS® v1.0). Hoboken, NJ: Wiley.
- Flanagan, D. P., Ortiz, S. O., & Alfonso, V. C. (2013). *Cross-Battery Assessment – Third Edition.* Hoboken, NJ: Wiley.

References

- Hale, J. B., & Fiorello, C. A. (2004). *School neuropsychology: A practitioner's handbook.* NY: The Guilford Press.
- Hale, J. B., Wycoff, K. L., & Fiorello, C. A. (2011). RTI and cognitive hypothesis testing for identification and intervention for specific learning disabilities: The best of both worlds. In D. P. Flanagan & V. C. Alfonso (Eds.). *Essentials of specific learning disability identification* (pp. 173-201). Hoboken, NJ: Wiley.

Contact Information

Dr. Daniel C. Miller
Emeritus Professor
Department of Psychology and Philosophy
Executive Director – Woodcock Institute
Texas Woman's University
Denton, Texas 76204
dmiller@twu.edu

Dr. Denise Maricle
Professor, Director Doctoral School Psychology Program at TWU dmaricle@twu.edu

LDA Conference Reminders

- Please take the session survey!
  - Session evaluations through Conference App or in back-of-room
- Visit The LDA Membership Booth in the exhibit hall to see first hand benefits of membership AND become a member!
- Check out these exciting things going on in the exhibit hall:
  - Over 60 exhibitors offering a wide variety of goods and services
  - Silent auction where you can bid on anything from art to fabulous hotel stays
  - Bookstore featuring many of our keynotes and presenters