


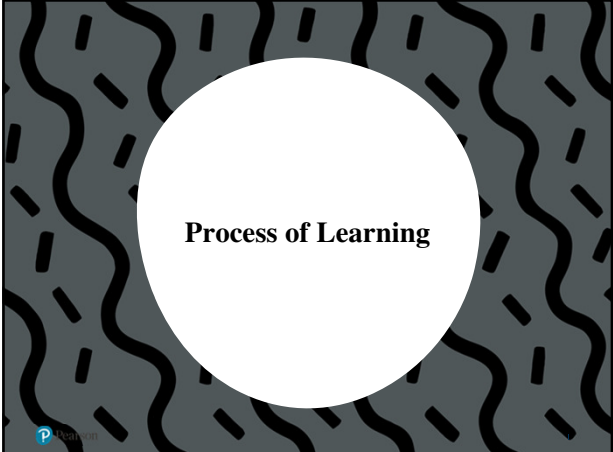



Using the WISC-V and WIAT-III to Diagnose Learning Disorders

29th August 2017


 Pearson

Using the WISC-V^{A&NZ} & WIAT-III^{A&NZ} to Diagnose Learning Disorders


Dr Melissa Stephens & Madeline Armstrong
Pearson Clinical Assessment
August, 2017




Process of Learning



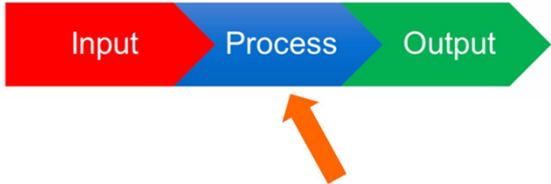
What is Learning?




- Learning is the process of acquiring information.
- What are the cognitive factors that enable students to **show** what they know and can do?
 - How do they collect, sort, store, and retrieve information?
 - How do they receive, perceive, process, and remember information?
- Other factors?
 - How do they “take in” information?
 - How do they “put out” information?



Cognitive Processing




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Sensory/Motor and Learning

To respond effectively to the demands of the typical classroom, children must be able to encode information, and show what they know.


- Is the child able to **see** the information (visual acuity)?
- Is the child able to **hear** the information (hearing acuity)?
- Is the child able to respond in **writing** (fine motor skills)?
- Is the child able to respond **orally** (language production)?



Attention and Learning

To receive, perceive, process, and remember information, children must:

- **selectively** attend to certain stimuli while ignoring competing, irrelevant stimuli.
- **sustain** attentional focus for a prolonged period.
- **shift** attentional resources from one activity to another.
- respond to more than one task simultaneously – **divided** attention.



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Visual-Spatial and Learning

Much of what is presented in school has either a visual-spatial or language basis.

- Visual-perceptual skills play a major role in the development of a child's **handwriting skills**, and **fluency in maths and reading**.
- For example, a student may be able to name individual letters in a word (visual analysis, b-e-d). She may be unable to integrate the letters to say the word (visual synthesis, bed).



Language and Learning

Language is the basis for much of the learning that occurs in schools.

- Children must understand words and sentences to perceive and process information - **receptive**.
- They must use words to show they can retrieve information from memory - **expressive**.
- Early development of reading depends critically on the...receptive phonological component of the aural system and the expressive phonological component of the oral system... (Berninger, 2007).



Language → Literacy

Speed of Processing and Learning

Efficient **cognitive processing** frees-up cognitive resources for more complex or higher-level tasks.

- A weakness in the speed of processing routine information may make the task of comprehending novel and/or non-routine information more time-consuming and difficult.
- For example, if a child names words effortlessly, s/he can focus cognitive energy on higher-order comprehension; if a child computes fluently, s/he can focus on application.



Working Memory and Learning

Many of the learning activities that children are engaged with in the classroom impose quite considerable burdens on **working memory**.

- For example, holding in mind information (a sentence to be written down) while doing something that for them is mentally challenging (spelling the individual words in the sentence); or, following lengthy instructions because they forget the instruction before the whole sequence of actions is completed.
- Characteristic of children with many kinds of learning difficulties (language, dyslexia, dyscalculia, ADHD, etc.)



What is a Specific Learning Disorder?

Specific Learning Disorder

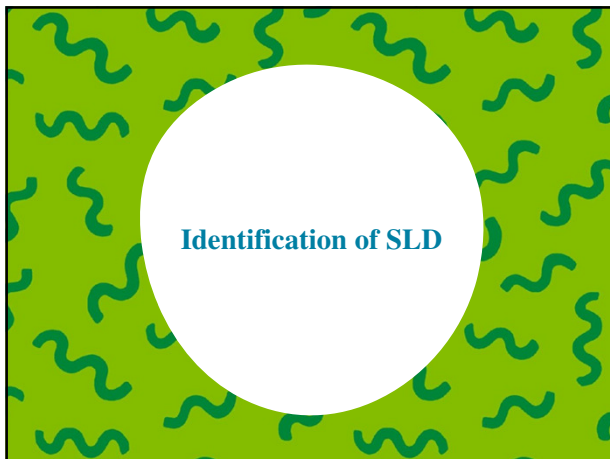
- Affects a person's ability to "**receive, store, process, retrieve, or communicate information**" (Cortiella & Horowitz, 2014, p.3)
- **Brain-based** disorder linked to neurological differences in brain structure
- Can manifest in **one or more areas of academic achievement**
- E.g. SLD can be specific with a student presenting with deficits in reading and writing, but performing at an average or above level in math and oral language.
- Outstanding feature of SLD is that the student's underachievement is **unexpected**
- Prevalence estimated to be between 5-15% of students
- Greatly benefit from the use of appropriate adaptations, accommodations, and compensatory strategies



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Historical perspective

Lack of clarity regarding definitions and distinctions between learning difficulties and learning disorders.

"Learning Disabilities" "Learning Disorders" "Slow Learners" "Learning Disabled" etc.

Research over past 20 years and changes in State and Federal legislation in other countries (particularly US) helping to produce a clearer understanding of students who fit under the umbrella term "Learning Difficulties".

Historical perspective

Previous methods of identification and assessment have failed to adequately distinguish between groups.

Advances in cognitive theory and assessment methods assisting with understanding cognitive differences between groups (eg. SLD vs Slow Learners).



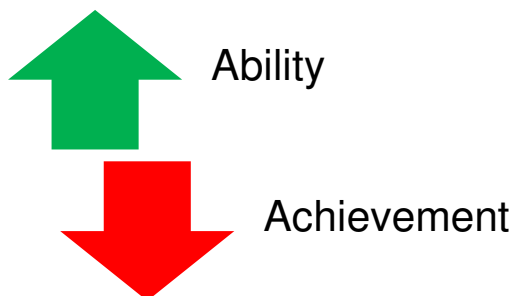
Historical perspective

Previous assessment and identification methods:

Ability-Achievement Discrepancy (AAD)

Statistical methods to measure size of difference between individual's cognitive ability and their academic achievement.

Generally = comparison of child's achievement to their FSIQ using standardised assessment.



Ability-Achievement Discrepancy (AAD)

Issues with this method:

- No specific formulas or numeric values provided by State or Federal legislation to allow for standard measure for discrepancy criteria.
- Potential to under- and over-diagnose due to arbitrary cut offs.

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Ability-Achievement Discrepancy (AAD)

Issues with this method:

- Based on erroneous assumption that FSIQ is...
 - Near-perfect predictor of academic achievement
 - Directly informs individual's potential
 - Can predict response to intervention.
- Removed from DSM due to overwhelming evidence to show insufficient.

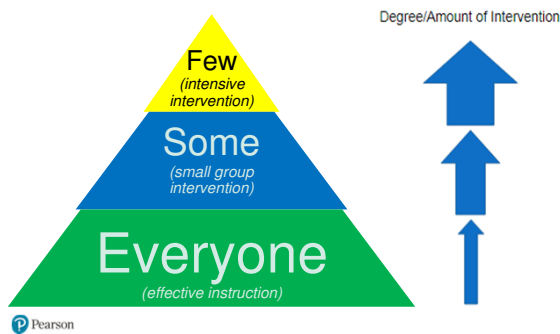
Historical perspective

Previous assessment and identification methods:

Response-To-Intervention (RTI) - ONLY

- SLD = inadequate response to intervention.
- 3 Tiers:
 - Tier 1 = quality instruction & screening
 - Tier 2 = evidence-based intervention (small group) and monitor
 - Tier 3 = individual intervention
 - If the student is still failing to respond at Tier 3, SLD can be diagnosed by default

Response to Intervention (RTI)



Response to Intervention (RTI)

Issues with this method:

- Lack of clear definition and criteria for RTI across states and nations resulting in vague, non-specific guidelines which can be interpreted in many ways.
- Traditional psychometric methods are abandoned - no further assessment of cognitive and achievement abilities for students who fail to respond at Tier 3.

Response to Intervention (RTI)

Issues with this method:

- What actually constitutes the "R" in RTI? How is response measured?
- Assumes that if a child isn't learning through the intervention provided, then the student must be deficient, not the intervention.
- No mathematics behind model



Response to Intervention (RTI)

Issues with this method:

- Fails to distinguish between learning difficulty groups.
- Ignores the notion that children with SLD have average - above average cognitive skills.



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DSM-5 Neurodevelopmental Disorders

315 (F81) Specific Learning Disorder

A. Difficulties learning and using academic skills, as indicated by the presence of **at least one** of the following symptoms that have **persisted for at least 6 months**, **despite provision of interventions** that target those difficulties:

- Inaccurate or slow and effortful word reading...
- ...understanding the meaning of what is read...
- ...spelling...
- ...written expression...
- ...mastering number sense, etc...
- ...mathematical reasoning...



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315 (F81) Specific Learning Disorder

B. The affected academic skills are **substantially and quantifiably** below those expected for the individual's **chronological age**, and cause significant interference with academic or occupational performance, or with activities of daily living.

NB: Requires psychometric evidence from an individually administered, psychometrically sound and culturally appropriate test of academic achievement that is norm-referenced. For the greatest diagnostic certainty, scores on one or more standardised tests or subtests within an academic domain of at least 1.5SD's below the mean for age, which translates to a Standard Score of 78 or less, which is below the 7th percentile (p.69).



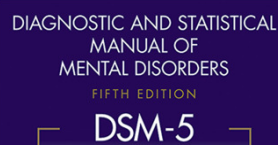
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315 (F81) Specific Learning Disorder

- C. The learning difficulties begin during **school-age years**...
- C. ...are **not better accounted** for by intellectual disabilities, uncorrected visual or auditory acuity, other mental or neurological disorders...etc.



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315 (F81) Specific Learning Disorder

Differential diagnosis (pp.73-74)

- **Normal variations** in academic attainment
- **Intellectual Disability** (Intellectual Developmental Disorder)
- Learning Difficulties due to **neurological or sensory disorder**
- **Neurocognitive disorders**
- Attention-Deficit/Hyperactivity Disorder (**ADHD**)
- **Psychotic disorders**



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315 (F81) Specific Learning Disorder

The four diagnostic criteria are to be met based on a **clinical synthesis** of the individual's history (developmental, medical, family, educational), school reports, and psychoeducational assessment.

Specifiers include with impairment in reading (dyslexia), written expression, and/or mathematics (dyscalculia); as well as severity.



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Patterns of Strengths and Weaknesses - A new approach?

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What is Patterns of Strengths and Weaknesses (PSW)?

- Developed from the need for a more **reliable** and **valid** method for identifying SLD, and distinguishing SLD from other learning difficulties, such as slow learners.
- Methods used within this model are based on 3 common components of SLD:
 - Cognitive and academic weaknesses are empirically related.
 - Generally average or above overall cognitive ability when cognitive weakness has been removed.
 - There is a statistically and clinically meaningful difference between overall cognitive ability and areas of cognitive and academic weakness.



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What is PSW?

- Requires the identification of a **processing weakness**.
 - Differentiates between SLD and underachievement (for other reasons).
 - SLD requires individualised instruction responsive to processing strengths and weaknesses.
- Important given using RTI *only* is not sufficient for diagnosing SLD.



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PSW Approaches

Read up on these prominent research-based PSW approaches if interested:

1. Concordance-discordance method (Hale & Fiorello, 2004).
2. Discrepancy/consistency method (Naglieri & Das, 1997).
3. Cross battery assessment approach (Flanagan, Ortiz, & Alfonso, 2013).



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PSW Approaches - Commonalities

- Rule out **exclusionary factors** as part of the definition of a learning disability (i.e. input and output issues).
- Identify a **cognitive processing weakness** that is related to the achievement weakness.
- Identify one or more **areas of strength** that are unrelated to the achievement weakness.



1

Methodological and Statistical Requirements for PSW

- The score comparisons must be significantly different (**discrepant**) to meet criteria for SLD identification:
 - processing strength vs achievement weakness
 - processing strength vs processing weakness
- Is there a **consistency** between the achievement weakness and the processing weakness?



Rationale for SLD, though not necessarily statistical

Methodological and Statistical Requirements for PSW

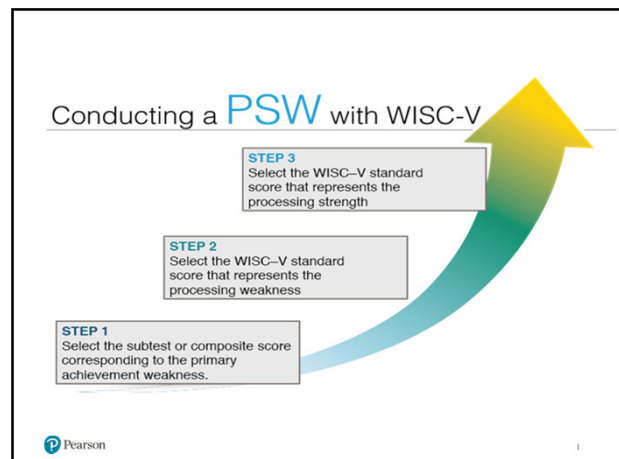
- Score comparisons are evaluated using the **simple-difference method** rather than the predicted-score (regression) method
 - Not an implicit causal relationship, as with AAD
- If comparisons are not statistically significant, the child does not demonstrate a pattern consistent with an SLD
 - However, use clinical judgement and multiple data points!



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Conducting PSW Analysis with WISC-V and WIAT-III:

Step 1

Select the WIAT-III **achievement weakness**.

- Subtest or composite score that corresponds to primary achievement weakness - consider below average scores of **less than 85**.
- Examine subtest variability within a WIAT-III composite score before selecting the composite as the achievement weakness; otherwise use subtests.



Step 2

Select the WISC-V standard score that represents the **processing weakness**.

- Generally associated with the achievement weakness.
- Examine subtest variability within the WISC-V standard scores before selecting a processing weakness.
 - Preferable** (not always necessary) to use a different standard score



Step 3

Select the WISC-V standard score that represents the **processing strength**.

- Processing strength not typically related to the achievement weakness.
- Examine subtest variability within the WISC-V standard scores before selecting the processing strength (see 2b).
- Avoid** using WMI, PSI, AWM as not well accepted as processing strengths.



Step 4

If the child is underachieving in **more than one** area, the analysis may be conducted once for **each** area of weakness.

It is important, however, to select the processing strength and weakness carefully each time, according to the achievement weakness selected.



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Comparing the Approaches

PSW

Primary Index scores, some of the Ancillary and Complementary Index scores are used as measures of processing strengths and weaknesses

AAD

FSIQ is used *unless* there is some compelling clinical reason to use VCI, VSI, FRI, QRI, NVI, or GAI (e.g., visual, motor or language problems; working memory, or processing speed issues related to some clinical conditions)

Comparing the Approaches

PSW

Two score comparisons are required to meet criteria

Statistical evidence of a processing weakness is an essential requirement

AAD

A single comparison is used

No statistical evidence is required for a processing weakness, though may include supplementary evaluation

US Research

- Data from WISC-IV / WIAT-II linking study.
- Goal to ascertain percentage of children previously classified as having an SLD who would meet the criteria for PSW model.
- Only 63% of 147 children previously identified as having an SLD (using school district criteria) met PSW model criteria.
- Utilising psychometric comparisons only, a slightly smaller number met the criteria of the PSW model than those of the AAD model.

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Important Reminders!

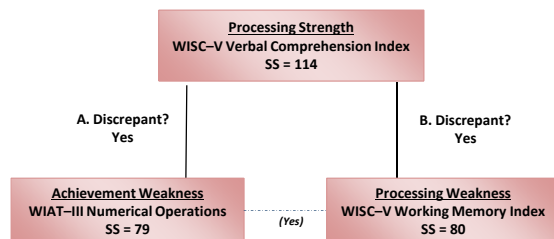
- PSW is intended to help **generate hypotheses** and not intended for use in isolation.
- Consider **all** available information, including:
 - developmental, medical, family, social, and academic **history**;
 - information gained from classroom and test session **observations** of behavior and motivation;
 - information gained from a **RTI** approach;
 - other **test results** including information obtained from teachers, parents, or other family members;
 - any **unusual** characteristics or disabilities.



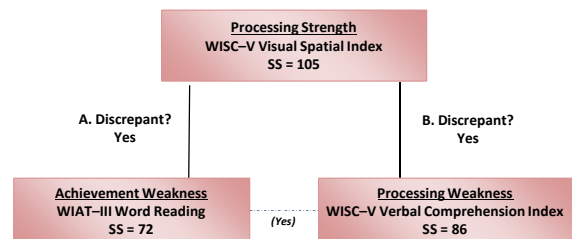
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Pattern of Strengths and Weaknesses - Case Examples

Pattern of Strengths and Weaknesses Model



Pattern of Strengths and Weaknesses Model



Pattern of Strengths and Weaknesses Analysis

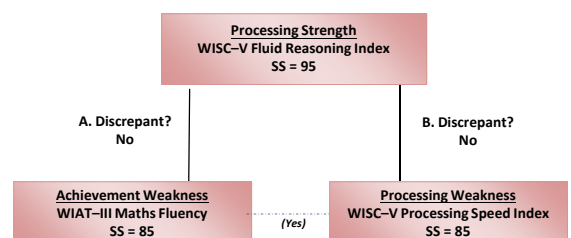
Comparison	Relative Strength Score	Relative Weakness Score	Diff.	Critical Value .05	Sign. Diff. Y / N	Supports SLD hypothesis? Yes / No
A Processing Strength / Achievement Weakness	105 (VSI)	72 (WR)	33	10.00	Y	Yes
B Processing Strength / Processing Weakness	105 (VSI)	86 (VCI)	19	12.00	Y	Yes

The PSW model is intended to help practitioners **generate hypotheses** regarding clinical diagnoses.

This analysis should always be used within a **comprehensive evaluation** that incorporates **multiple sources** of information and takes into consideration **intervention**.



Pattern of Strengths and Weaknesses Model



Using the WISC-V and WIAT-III to Diagnose Learning Disorders

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Pattern of Strengths and Weaknesses Analysis

Comparison	Relative Strength Score	Relative Weakness Score	Diff.	Critical Value .05	Sign. Diff. Y / N	Supports SLD hypothesis? Yes / No
A Processing Strength / Achievement Weakness	95 (FRI)	85 (MF)	10	11.00	N	No
B Processing Strength / Processing Weakness	95 (FRI)	85 (PSI)	10	13.00	N	No

The PSW model is intended to help practitioners **generate hypotheses** regarding clinical diagnoses.

This analysis should always be used within a **comprehensive evaluation** that incorporates **multiple sources** of information and takes into consideration **intervention**.



Ability-Achievement Discrepancy Analysis

WIAT-III Subtest	Predicted WIAT-III Score	Actual WIAT-III Score	Diff.	Critical Value .05	Sign. Diff. Y / N	Base Rate
Maths Problem Solving	102	85	17	11.89	Y	<=5%
Mathematics	102	86	16	9.82	Y	<=5%
Maths Fluency	102	85	17	10.01	Y	<=5%



A Case Study

Lilly

8 years, 2 months

Grade 3

Attends mainstream school

Language: English

Referral: Lilly is experiencing ongoing difficulties with reading despite participating in reading recovery in Grade 1.



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WISC V Profile



Composite Score Summary

Composite	Sum of Scaled Scores	Composite Score	Percentile Rank	95% Confidence Interval	Qualitative Description	SEM
Verbal Comprehension	VCI 18	95	37	88-103	Average	3.67
Visual Spatial	VSI 19	97	42	89-105	Average	3.97
Fluid Reasoning	FRI 18	94	34	87-102	Average	4.74
Working Memory	WMI 18	94	34	88-101	Average	3.35
Processing Speed	PSI 13	80	9	73-92	Low Average	5.41
Full Scale IQ	FSIQ 58	87	19	82-93	Low Average	3.00

Confidence intervals are calculated using the Standard Error of Estimation.



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WIAT-III Profile



Subtest Score Summary

Subtest	Raw Score	Standard Score	90% Confidence Interval	Percentile Rank	Normal Curve Equiv.	Stanine	Year Equiv. (AUNZ)	Age Equiv.	Growth Score
Listening Comprehension	-	88	78-98	21	33	3	1;4;2;4	6;5	475
Reading Comprehension	26 ¹	93	86-100	32	40	4	2;3;2	7;4	490
Maths Problem Solving	35	85	78-92	16	29	3	2;1;3;1	7;0	435
Word Reading	12	78	75-81	7	19	2	<1;1;2;1	<6;0	360
Pseudoword Decoding	7	87	83-91	19	32	3	1;1;2;1	6;4	422
Numerical Operations	18	90	82-98	25	36	4	2;3;2	7;4	439
Oral Expression	-	93	85-101	32	40	4	2;3;2	7;3	484
Oral Reading Fluency	41 ^{1,2}	81	74-88	10	23	2	1;2;2	6;0	460
Spelling	11	83	77-89	13	26	3	1;2;2	6;4	382
Maths Fluency-Addition	10	81	70-92	10	23	2	1;2;2	6;4	381
Maths Fluency-Subtraction	4	81	73-89	10	23	2	1;2;2	6;4	370
Maths Fluency-Multiplication	1	81	74-88	10	23	2	<3;1;4;1	<8;0	394

¹ Indicates a subtest with multiple raw scores (shown in the Subtest Component Score Summary).

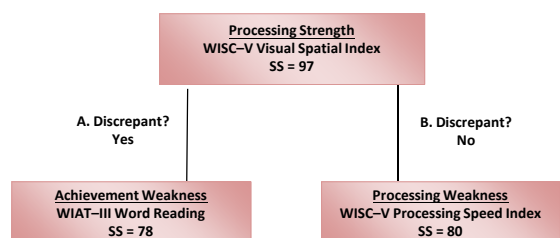
² Indicates a raw score that is converted to a weighted raw score (not shown).

³ Indicates that a raw score is based on a below year level item set.



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Pattern of Strengths and Weaknesses Model



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Pattern of Strengths and Weaknesses Analysis

Comparison	Relative Strength Score	Relative Weakness Score	Diff.	Critical Value .05	Sign. Diff. Y / N	Supports SLD hypothesis? Yes / No
A Processing Strength / Achievement Weakness	97 (VSI)	78 (WR)	19	13.00	Y	Yes
B Processing Strength / Processing Weakness	97 (VSI)	80 (PSI)	17	17.00	N	No

The PSW model is intended to help practitioners **generate hypotheses** regarding clinical diagnoses.

This analysis should always be used within a **comprehensive evaluation** that incorporates **multiple sources** of information and takes into consideration **intervention**.



ABILITY-ACHIEVEMENT DISCREPANCY ANALYSIS

Ability Score: WISC-V FSIQ: 87
Date of Testing: WISC-V 07-10-2017; WIAT-III 24-06-2017

Predicted Difference Method

	Predicted WIAT-III Score	Actual WIAT-III Score	Difference	Critical Value .01	Significant Difference Y/N	Base Rate	Standard Deviation Discrepancy ≥ 1.0 SD
WIAT-III Subtest							
Reading Comprehension	92	90	2	14.89	N	>25%	N
Maths Problem Solving	90	85	5	11.89	N	>25%	N
Word Reading	92	78	14	7.54	Y	<=10%	N
Pseudoword Decoding	92	87	5	8.15	N	>25%	N
Numerical Operations	91	90	1	11.62	N	>25%	N
Oral Expression	90	93	-3	14.06	N	N/A	N/A
Oral Reading Fluency	93	81	12	11.09	Y	<=25%	N
Spelling	92	83	9	9.27	N	<=25%	N
WIAT-III Composite							
Total Reading	92	81	11	7.49	Y	<=25%	N
Basic Reading	92	82	10	6.23	Y	<=25%	N
Reading Comprehension and Fluency	92	81	11	12.59	N	<=25%	N
Mathematics	90	86	4	9.82	N	>25%	N
Maths Fluency	92	79	13	10.01	Y	<=15%	N

Note: Base rates and standard deviation discrepancies are not reported when the actual achievement score equals or exceeds the predicted achievement score.



Summary & Recommendations

Does not meet criteria for a Specific Learning Disorder - not statistically using PSW method nor meeting intervention criteria (reading recovery does not count as evidence-based explicit instruction for reading difficulties).

Given processing speed weakness, we would expect some areas of academics to be impacted. Behaviour assessment also revealed elevated anxiety which may also be impacting on school performance.

- Tutoring - specifically targeting her letter-sound knowledge and reading.
- Implement Individual Learning Plan at school to monitor progress and goals.
- Make reasonable adjustments within the classroom to assist with processing speed weakness (eg. allow more time to complete set work, reduce quantity in favour of quality, limit copying activities).

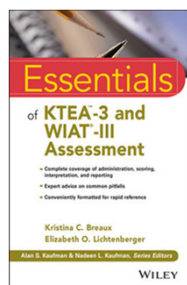


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WIAT-III Skills Analysis Report

Word Reading		Total Errors by Skill	Max. Errors by Skill	% Correct	
Feature	Skill			By Skill	By Feature
Morphology Types	Common Prefixes/Word Beginnings	-	-	-	-
	Common Suffixes/Word Endings	-	-	-	-
Vowel Types	VCE Syllables	0	1	100%	75%
	Irregular Vowels	0	2	100%	
	Single Short Vowels	0	3	100%	
	Single Long Vowels	1	1	0%	
	Schwa Vowel Sounds	1	1	0%	
	Vowel Digraphs	0	2	100%	
	Diphthongs	0	1	100%	
	R-Controlled Vowels	1	1	0%	
	Silent Vowels	-	-	-	
	Consonant Digraphs	2	4	50%	
Consonant Types	Single Consonants	1	10	90%	75%
	Double Consonants	-	-	-	
	S as /z/ or /zh/	-	-	-	
	T as /sh/ or /ch/	-	-	-	
	C as /sh/	-	-	-	
	R-Family Blends	-	-	-	
	L-Family Blends	-	-	-	
	S-Family Blends	0	1	100%	
	Consonant Blends/Clusters	1	1	0%	
	Silent Consonants	-	-	-	

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WIAT-III Intervention Goal Statements Report

Word Reading

Consonant Digraphs
Items with Errors: 9, 10

Annual Goal

- Given a list of ____ words containing (circle: initial/medial/final) position consonant digraphs, the student will identify the digraphs and read the list aloud with no more than ____ consonant digraph errors.
Consonant digraphs will include the following (circle/enter): ch, sh, th, wh, ng, dg, gh, ____.

Short-Term Objectives

- The student will watch the teacher use letter cards to form ____ one-syllable words/nonwords containing consonant digraphs (forming one word at a time and creating a new word by placing a different letter card on top of one of the cards), and the student will read the words with no more than ____ errors.
Consonant digraphs will include the following (circle/enter): ch, sh, th, wh, ng, dg, gh, ____.

Card examples: [ch] [o] [p], [sh] [o] [p], [p] [o] [sh]

Note: To encourage reading with comprehension, the student may also be challenged to orally use each word in a sentence after reading each word aloud; if words and nonwords are formed, the teacher may ask, *Is this a word?* after the student reads each one.

Essentials
of **Specific Learning Disability Identification**

- Complete coverage on how SLD manifests in academic performance
- Expert advice on theory- and research-based approaches to SLD identification
- Conveniently formatted for rapid reference

Dawn P. Flanagan
Vincent C. Alfonso

Alan S. Kaufman & Nadeen L. Kaufman, Series Editors

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Questions?
Comments?

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Upcoming webinar:
Mind the Gap: Identifying and supporting students with additional needs

Wednesday 20 September
12.30-1.30pm (AEST)

To register:
<https://attendee.gotowebinar.com/register/7950126959955613698>

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ALWAYS LEARNING