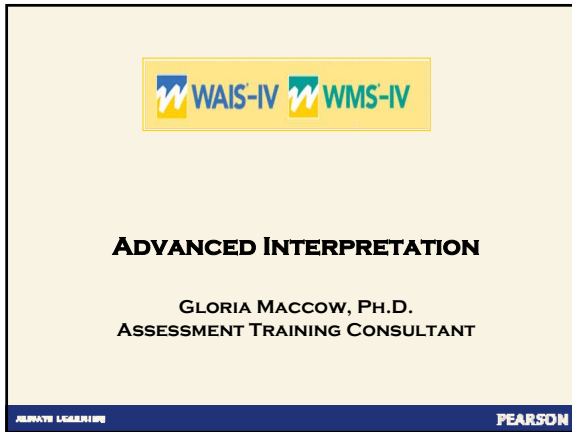


Advanced Interpretation of the Wechsler Adult Intelligence Scale-Fourth Edition and the  
Wechsler Memory Scale-Fourth Edition  
Gloria Maccow, Ph.D., Assessment Training Consultant



**ADVANCED INTERPRETATION**

GLORIA MACCOW, PH.D.  
ASSESSMENT TRAINING CONSULTANT

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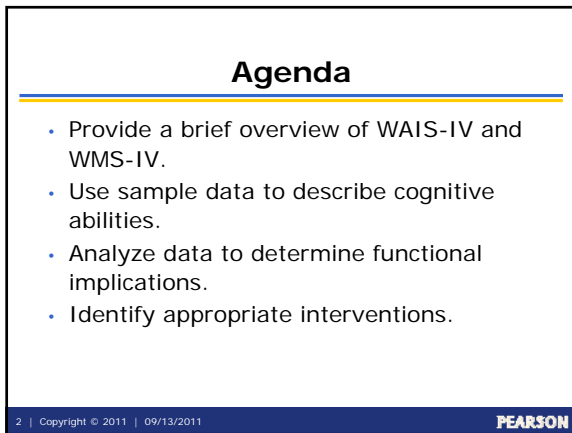
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**Agenda**

- Provide a brief overview of WAIS-IV and WMS-IV.
- Use sample data to describe cognitive abilities.
- Analyze data to determine functional implications.
- Identify appropriate interventions.

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**BRIEF OVERVIEW**

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### Wechsler's Definition of Intelligence

**"INTELLIGENCE IS THE AGGREGATE OR GLOBAL CAPACITY OF THE INDIVIDUAL TO ACT PURPOSEFULLY, TO THINK RATIONALLY, AND TO DEAL EFFECTIVELY WITH HIS ENVIRONMENT."**

Wechsler, D. (1939). *The measurement of adult intelligence*. Baltimore, MD: Williams & Wilkins, p. 229.

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### TEST STRUCTURE

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### WAIS-IV Content and Structure Ages 16 – 90

<b>Verbal Comprehension Scale</b> Core Subtests Information Similarities Vocabulary Supplemental Subtests Comprehension	<b>Perceptual Reasoning Scale</b> Core Subtests Block Design Matrix Reasoning Visual Puzzles <b>New!</b> Supplemental Subtests Picture Completion Figure Weights (16-69) <b>New!</b>
<b>FSIQ</b>	
<b>Working Memory Scale</b> Core Subtests Arithmetic Digit Span Supplemental Subtests Letter-Number Sequencing (16-69)	<b>Processing Speed Scale</b> Core Subtests Coding Symbol Search Supplemental Subtests Cancellation (16-69) <b>New!</b>

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**WAIS-IV** Record Form  
 WECHSLER ADULT INTELLIGENCE SCALE-FOURTH EDITION

Examiner Name: \_\_\_\_\_

Test Date: Year:  Month:  Day:

Birth Date: Year:  Month:  Day:

Test Age:

**Total Raw Score to Scaled Score Conversion**

Subtest	Raw Score	Scaled Score	Pr. Group Score
Block Design	<input type="text"/>	<input type="text"/>	<input type="text"/>
Similarities	<input type="text"/>	<input type="text"/>	<input type="text"/>
Digit Span	<input type="text"/>	<input type="text"/>	<input type="text"/>
Matrix Reasoning	<input type="text"/>	<input type="text"/>	<input type="text"/>
Vocabulary	<input type="text"/>	<input type="text"/>	<input type="text"/>
Arithmetic	<input type="text"/>	<input type="text"/>	<input type="text"/>
Symbol Search	<input type="text"/>	<input type="text"/>	<input type="text"/>
Visual Puzzles	<input type="text"/>	<input type="text"/>	<input type="text"/>
Information	<input type="text"/>	<input type="text"/>	<input type="text"/>
Coding	<input type="text"/>	<input type="text"/>	<input type="text"/>
Letter-Number Seq.*	<input type="text"/>	<input type="text"/>	<input type="text"/>
Figure Weights*	<input type="text"/>	<input type="text"/>	<input type="text"/>
Comprehension	<input type="text"/>	<input type="text"/>	<input type="text"/>
Concentration*	<input type="text"/>	<input type="text"/>	<input type="text"/>
Picture Completion	<input type="text"/>	<input type="text"/>	<input type="text"/>

Sum of Scaled Scores: \_\_\_\_\_

\* 16-69 only

Verbal Composite:  Non-Verbal:  Full Scale:

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**WAIS-IV**  
 WECHSLER ADULT INTELLIGENCE SCALE-FOURTH EDITION

**Subtest Scaled Score Profile**

	Verbal Comprehension				Perceptual Reasoning				Working Memory			Processing Speed			
	SI	VC	IN	CO	BD	MR	VP	FW	PCm	DS	AR	LN	SS	CD	CA
19	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
18	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
17	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
16	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
15	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
14	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
13	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
12	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
11	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
10	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
9	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
8	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
7	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
6	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
5	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
4	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
3	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
1	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.

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**WAIS-IV**  
 WECHSLER ADULT INTELLIGENCE SCALE-FOURTH EDITION

**Composite Score Profile**

	VCI	PHI	WMI	PSI	FSIQ
160					
150					
140					
130					
120					
110					
100					
90					
80					
70					
60					
50					
40					

Optional Index Score: General Ability Index

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### What is the GAI?

GAI = sum of scaled scores for VCI subtests and PRI subtests.

The WAIS-IV GAI provides the practitioner with a summary score that is less sensitive than the FSIQ to the influence of working memory and processing speed.

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### GAI

- The GAI provides an estimate of general intellectual ability, with **reduced emphasis** on working memory and processing speed relative to the FSIQ.
- Theoretically, the GAI represents an individual's overall cognitive ability if working memory and processing speed were similar to verbal and perceptual reasoning abilities.

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### Use the GAI for Discrepancy Comparisons

- WAIS-IV GAI should be used for discrepancy comparisons
  - Ability and Memory
  - Ability and achievement
- GAI is **NOT** a replacement for FSIQ

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### Generally, . . . When to Use the GAI

Consider\* using the GAI if a significant and unusual discrepancy exists between

- ✓ VCI and WMI; or
- ✓ PRI and PSI; or
- ✓ WMI and PSI, or
- ✓ between subtests within WMI and/or PSI.

**Note:** The FSIQ is the most valid measure of overall cognitive ability and WM and PS are vital to comprehensive evaluation of cognitive ability.

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### General Ability Index – Note!

- The GAI is used when neuropsychological deficits adversely impact performance on WM and PS.
- Impaired performance on WM and/or PS may mask actual differences between general cognitive ability (FSIQ) and other cognitive functions (e.g., memory).
- The GAI does not replace the FSIQ. Report and interpret GAI along with FSIQ.

[see WAIS-IV Technical Manual]

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### Deriving and Analyzing the GAI

- Step 1.** Obtain the General Ability Sum of Scaled Scores
- Step 2.** Determine the GAI Score (Table C.1 – Tech Manual)
- Step 3.** Perform the FSIQ–GAI Discrepancy Comparison

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**Step 2 – Technical Manual**

**Table C.1** GAI Equivalents of Sums of Scaled Scores

Sum of Scaled Scores	GAI	Percentile Rank	Confidence Level		Sum of Scaled Scores	GAI	Percentile Rank	Confidence Level	
			90%	95%				90%	95%
6	40	<0.1	38-46	37-47	61	101	53	97-105	96-106
7	41	<0.1	39-47	38-48	62	101	53	97-105	96-106
8	42	<0.1	40-48	39-49	63	102	55	98-106	97-107
9	44	<0.1	42-50	41-51	64	103	58	99-107	98-108
10	45	<0.1	43-51	42-52	65	104	61	100-108	99-109
11	46	<0.1	43-52	43-53	66	105	63	101-109	100-110
12	48	<0.1	45-54	45-54	67	106	66	102-110	101-111
13	49	<0.1	46-55	46-55	68	107	68	103-111	102-112
14	50	<0.1	47-56	47-56	69	108	70	104-112	103-113
15	52	0.1	49-58	49-58	70	110	75	106-114	105-115
16	53	0.1	50-59	49-59	71	111	77	107-115	106-116
17	54	0.1	51-60	50-60	72	112	79	107-116	107-117
18	55	0.1	52-60	51-61	73	113	81	108-117	108-118
19	56	0.2	53-61	52-62	74	114	82	109-118	109-119
20	57	0.2	54-62	53-63	75	115	84	110-119	110-119

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**Step 3 – Technical Manual**

**Table C.2** Differences Between the FSIQ and the GAI Required for Statistical Significance (Critical Values), by Age Group and Overall Normative Sample

Age Group	Level of Significance	Critical Value
16-17	.15	2.91
	.05	3.96
18-19	.15	2.51
	.05	3.41
75-79	.15	2.45
	.05	3.34
80-84	.15	2.35
	.05	3.19
85-90	.15	2.52
	.05	3.44

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**Updated Table C.2**  
**WAIS-IV Technical Manual**

<http://pearsonassess.com/HAIWEB/Cultures/en-us/Productdetail.htm?Pid=015-8980-808&Mode=scoring>

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### Step 3 – Technical Manual

**Table C3** Cumulative Percentages of Normative Sample (Base Rates) Obtaining Various FSIQ-GAI Discrepancies, by Overall Sample and GAI Ability Level

Amount of Discrepancy	Overall Sample		GAI ≥ 120		Amount of Discrepancy
	FSIQ-GAI (-)	FSIQ-GAI (+)	FSIQ-GAI (-)	FSIQ-GAI (+)	
>40	0.0	0.0	0.0	0.0	>40
39	0.0	0.0	0.0	0.0	39
38	0.0	0.0	0.0	0.0	38
37	0.0	0.0	0.0	0.0	37
36	0.0	0.0	0.0	0.0	36
35	0.0	0.0	0.0	0.0	35
34	0.0	0.0	0.0	0.0	34
33	0.0	0.0	0.0	0.0	33
32	0.0	0.0	0.0	0.0	32
31	0.0	0.0	0.0	0.0	31
<hr/>					
10	2.3	2.2	7.1	2.0	10
9	3.6	3.4	10.7	2.8	9
8	5.7	5.2	17.9	4.8	8
7	8.1	8.0	22.2	7.1	7
6	12.4	11.6	31.0	8.7	6

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### Memory and Learning

- **Learning** - process of acquiring new information.
- **Memory** - persistence of learning in a state that can be revealed at a later time" (Squire, 1987).
- WMS-IV measures ability to learn and remember information presented verbally and visually.

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 Gloria Maccow, Ph.D., Assessment Training Consultant

**Process of Learning and Remembering**

- Encoding** External information is transformed into mental representations or memories and stored in STM.
- Consolidation** Information from immediate memory is solidified into long-term memory stores.
- Retrieval** Information is brought into conscious awareness.

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**WMS-IV** Adult Battery (Ages 16-69) Record Form

Examinee Name: \_\_\_\_\_ Test Date: Year:  Month:  Day:

Examiner Name: \_\_\_\_\_ Birth Date: Year:  Month:  Day:

Test Age: Year:  Month:  Day:

Subtest	Raw Score	Scaled Score				
Logical Memory I						
Logical Memory II						
Verbal Paired Associates I						
Verbal Paired Associates II						
CVLT-II Trials 1-5						
CVLT-II Long-Delay						
Designs I						
Designs II						
Visual Reproduction I						
Visual Reproduction II						
Spatial Addition						
Symbol Span						

**Sum of Scaled Scores to Index Conversion**

	Auditory Memory (AMI)	Visual Memory (VMI)	Visual Working Memory (VWM)	Immediate Memory (IMI)	Delayed Memory (DMI)
Sum of Scaled Scores					
Index Score					
Percentile Rank					
Confidence Interval					

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**WMS-IV** Older Adult Battery Record Form (Ages 65-90)

Examinee Name: \_\_\_\_\_ Test Date: Year:  Month:  Day:

Examiner Name: \_\_\_\_\_ Birth Date: Year:  Month:  Day:

Test Age: Year:  Month:  Day:

Subtest	Raw Score	Scaled Score				
Logical Memory I						
Logical Memory II						
Verbal Paired Associates I						
Verbal Paired Associates II						
CVLT-II Trials 1-5						
CVLT-II Long-Delay						
Visual Reproduction I						
Visual Reproduction II						
Symbol Span						

**Sum of Scaled Scores to Index Conversion**

	Auditory Memory (AMI)	Visual Memory (VMI)	Visual Working Memory (VWM)	Immediate Memory (IMI)	Delayed Memory (DMI)
Sum of Scaled Scores					
Index Score					
Percentile Rank					
Confidence Interval					

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 Gloria Maccow, Ph.D., Assessment Training Consultant

**WMS-IV**  
WECHSLER MEMORY SCALE™-FOURTH EDITION

Primary Subtest Scaled Score Profile

	Auditory Memory						Visual Memory				Visual Working Memory		
	LM I	LM II	VPA I	VPA II	CVLT-B 1-5	CVLT-B LD	DE I	DE II	VR I	VR II	SA	SSP	
19	*	*	*	*	*	*	*	*	*	*	*	*	19
18	*	*	*	*	*	*	*	*	*	*	*	*	18
17	*	*	*	*	*	*	*	*	*	*	*	*	17
16	*	*	*	*	*	*	*	*	*	*	*	*	16
15	*	*	*	*	*	*	*	*	*	*	*	*	15
14	*	*	*	*	*	*	*	*	*	*	*	*	14
13	*	*	*	*	*	*	*	*	*	*	*	*	13
12	*	*	*	*	*	*	*	*	*	*	*	*	12
11	*	*	*	*	*	*	*	*	*	*	*	*	11
10	*	*	*	*	*	*	*	*	*	*	*	*	10
9	*	*	*	*	*	*	*	*	*	*	*	*	9
8	*	*	*	*	*	*	*	*	*	*	*	*	8
7	*	*	*	*	*	*	*	*	*	*	*	*	7
6	*	*	*	*	*	*	*	*	*	*	*	*	6
5	*	*	*	*	*	*	*	*	*	*	*	*	5
4	*	*	*	*	*	*	*	*	*	*	*	*	4
3	*	*	*	*	*	*	*	*	*	*	*	*	3
2	*	*	*	*	*	*	*	*	*	*	*	*	2
1	*	*	*	*	*	*	*	*	*	*	*	*	1

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**WMS-IV**  
WECHSLER MEMORY SCALE™-FOURTH EDITION

Index Score Profile

	Index Scores					
	AMI	VMI	VWMI	IMI	DMI	
160	=====	=====	=====	=====	=====	160
155	=====	=====	=====	=====	=====	155
150	=====	=====	=====	=====	=====	150
145	=====	=====	=====	=====	=====	145
140	=====	=====	=====	=====	=====	140
135	=====	=====	=====	=====	=====	135
130	=====	=====	=====	=====	=====	130
125	=====	=====	=====	=====	=====	125
120	=====	=====	=====	=====	=====	120
115	=====	=====	=====	=====	=====	115
110	=====	=====	=====	=====	=====	110
105	=====	=====	=====	=====	=====	105
100	=====	=====	=====	=====	=====	100
95	=====	=====	=====	=====	=====	95
90	=====	=====	=====	=====	=====	90
85	=====	=====	=====	=====	=====	85
80	=====	=====	=====	=====	=====	80
75	=====	=====	=====	=====	=====	75
70	=====	=====	=====	=====	=====	70
65	=====	=====	=====	=====	=====	65
60	=====	=====	=====	=====	=====	60
55	=====	=====	=====	=====	=====	55
50	=====	=====	=====	=====	=====	50
45	=====	=====	=====	=====	=====	45
40	=====	=====	=====	=====	=====	40

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**WMS-IV Scores**

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- Primary Subtest Scaled Scores (mean=10, sd = 3; range 1 – 19)
- Index Scores (mean=100, sd = 15; range 40 – 160)
- Process Scores (Scaled Score or Cumulative Percentage)
- Contrast Scaled Scores

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### Contrast Scores

Adjust one score based on performance on a previous or more basic task

- Delayed Memory adjusted for Immediate Memory
- Recall Memory adjusted for Recognition
- Recall Memory adjusted for Repetition

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### Contrast Scores – Note!

The basis of the comparison for contrast scores is other people of similar performance levels on the initial/control skill, not age-based peers.

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### Contrast Scores – Note!

If the client earns a scaled score of 13, then s/he is performing better than expected on the dependent variable compared to individuals of similar performance levels on control variable.

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### Contrast Scores – Note!

- ◆ The contrast score is based on relative standing on the control variable.
- ◆ It provides information about performance relative to the control variable skill area.

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### Contrast Score Overview

- Scored on 1-19 Scaled Score Metric.
- Does not replace normative scores.
- Answers specific hypothesis about an examinee's performance relative to his/her performance on other measures.

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### Contrast Score Overview

- Normative score asks: Is this person's delayed memory impaired?
- Contrast score asks: Is this person's delayed memory impaired given his/her initial encoding ability?

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### Contrast Score Interpretation

Higher scores indicate better than expected performance on the dependent variable given performance on the control variable.

For example,

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### Contrast Score Interpretation

- Delayed Memory is better than expected given the examinee's level of ability on immediate memory.
- Delayed Memory is superior when compared to individuals of similar encoding ability.

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### Contrast Score Interpretation

Low scores indicate poorer than expected performance on the dependent score given performance on the control score.

For example,

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### Contrast Score Interpretation

- Delayed Memory is impaired given the examinee's level of ability on immediate memory.
- Delayed Memory is impaired when compared to individuals of similar encoding ability.

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### Contrast Score Interpretation

- Scores in the average range (8-12) indicate no difference in performance between the control and dependent measures. For example,
- Delayed Memory performance is similar to encoding ability.

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### Ability & Memory WAIS-IV and WMS-IV

- Is the examinee's memory ability in **<WMS area>** unusually high or low, given cognitive ability?
  - Predicted-difference methodology recommended - not simple difference
- Evaluate statistical significance and base rate.

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**Ability & Memory  
WAIS-IV and WMS-IV**

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Use GAI for this comparison rather than FSIQ.

- Reduces impact of WM and PS from ability results.
- However, when reporting ability information, use **FSIQ** - GAI is NOT a short-form.

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**APPLICATION**

Dr. Wechsler: What we measure with tests of intelligence is . . . the capacity of the individual to understand the world around him and his ability to cope with its challenges.

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**Remember: Many Factors can Influence Performance!**

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- Acuity
- Attention
- Executive Functioning
- Working Memory
- Language Impairment
- Visual-Spatial Processing
- Fatigue
- Poor Effort
- Impulsivity

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### Input and Output Demands of the Tasks

<p><b>Verbal Comprehension Scale</b></p> <p><b>Core Subtests</b>                  Information                  Similarities                  Vocabulary</p> <p><b>Supplemental Subtests</b>                  Comprehension</p>	<p><b>Perceptual Reasoning Scale</b></p> <p><b>Core Subtests</b>                  Block Design                  Matrix Reasoning                  Visual Puzzles <span style="color: green;">New!</span></p> <p><b>Supplemental Subtests</b>                  Picture Completion                  Figure Weights (16-69) <span style="color: green;">New!</span></p>
<b>FSIQ</b>	
<p><b>Working Memory Scale</b></p> <p><b>Core Subtests</b>                  Arithmetic                  Digit Span</p> <p><b>Supplemental Subtests</b>                  Letter-Number Sequencing (16-69)</p>	<p><b>Processing Speed Scale</b></p> <p><b>Core Subtests</b>                  Coding                  Symbol Search</p> <p><b>Supplemental Subtests</b>                  Cancellation (16-69) <span style="color: green;">New!</span></p>

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### Abilities Measured

<p><b>Verbal Comprehension Scale</b></p> <p><b>Core Subtests</b>                  Information                  Similarities                  Vocabulary</p> <p><b>Supplemental Subtests</b>                  Comprehension</p>	<p><b>Perceptual Reasoning Scale</b></p> <p><b>Core Subtests</b>                  Block Design                  Matrix Reasoning                  Visual Puzzles <span style="color: green;">New!</span></p> <p><b>Supplemental Subtests</b>                  Picture Completion                  Figure Weights (16-69) <span style="color: green;">New!</span></p>
<b>FSIQ</b>	
<p><b>Working Memory Scale</b></p> <p><b>Core Subtests</b>                  Arithmetic                  Digit Span</p> <p><b>Supplemental Subtests</b>                  Letter-Number Sequencing (16-69)</p>	<p><b>Processing Speed Scale</b></p> <p><b>Core Subtests</b>                  Coding                  Symbol Search</p> <p><b>Supplemental Subtests</b>                  Cancellation (16-69) <span style="color: green;">New!</span></p>

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### Application

**SEVEN TEEN**  
**AGE 17 YEARS 1 MONTH**  
**FUNCTIONAL ENVIRONMENT**  
**HIGH SCHOOL**

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### Intake Information

- Seven is a white male who is a Junior in high school.
- He is looking at college options.
- His SAT scores are very good.
- His grades are variable.
- His parents and teachers requested a psychological evaluation to identify factors that might explain the variability in his school performance.

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### Contextual Analysis

- Highschool - Junior
- Challenges related to learning
- In acquiring new information, is he able to encode, consolidate, retrieve information presented verbally/ visually?
- What factors impact his ability to receive, perceive, store, and remember information?

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### Procedures Used

- Clinical Interview
- Self-Report of Personality-Adolescent
- WAIS-IV
- WMS-IV
- WIAT-III

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Advanced Interpretation of the Wechsler Adult Intelligence Scale-Fourth Edition and the  
Wechsler Memory Scale-Fourth Edition  
Gloria Maccow, Ph.D., Assessment Training Consultant

### WAIS-IV Scores

Index/Subtest	Composite Score/ Scaled Score	Index/Subtest	Composite Score/ Scaled Score
<b>Verbal Comprehension</b>	<b>120</b>	<b>Perceptual Reasoning</b>	<b>115</b>
Information	11	Block Design	12
Similarities	14	Matrix Reasoning	13
Vocabulary	16	Visual Puzzles	13
<b>Working Memory</b>	<b>95</b>	<b>Processing Speed</b>	<b>111</b>
Arithmetic	9	Coding	11
Digit Span	9	Symbol Search	13
<b>Full Scale IQ</b>	<b>114</b>	<b>General Ability Index</b>	<b>121</b>

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### Discrepancy Comparisons

Comparison	Score 1	Score 2	Diff.	Critical Value .05	Sign. Diff. Y/N	Base Rate*
VCI - PRI	120	115	5	9.74	N	--
VCI - WMI	120	95	25	10.6	Y	2.8
VCI - PSI	120	111	9	12.47	N	--
PRI - WMI	115	95	20	10.18	Y	7.1
PRI - PSI	115	111	4	12.12	N	--
WMI - PSI	95	111	-16	12.82	Y	13.5
FSIQ - GAI	114	121	-7	3.96	Y	8.1

\*Overall Sample

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### Subtest-Level Ss and Ws

Subtest	Subtest Scaled Score	Mean Scaled Score	Diff.	Critical Value .05	S or W	Base Rate
Block Design	12	12.10	-.10	2.85		
Similarities	14	12.10	1.9	2.82		
Digit Span	9	12.10	-3.1	2.22	W	15%
Matrix Reasoning	13	12.10	0.9	2.54		
Vocabulary	16	12.10	3.9	2.03	S	2-5%
Arithmetic	9	12.10	-3.1	2.73	W	10-15%
Symbol Search	13	12.10	0.9	3.42		
Visual Puzzles	13	12.10	0.9	2.71		
Information	11	12.10	-1.1	2.19		
Coding	11	12.10	-1.1	2.97		

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### Process Analysis

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Perceptual Reasoning Process Score Summary			
Process Score	Raw Score	Scaled Score	Percentile Rank
Block Design No Time Bonus	43	11	63

Working Memory Process Score Summary				
Process Score	Raw Score	Scaled Score	Percentile Rank	Base Rate
Digit Span Forward	9	8	25	--
Digit Span Backward	8	9	37	--
Digit Span Sequencing	8	9	37	--
Longest Digit Span Forward	6	--	--	77
Longest Digit Span Backward	5	--	--	53
Longest Digit Span Sequence	7	--	--	26.5

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### Process Analysis

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Process Level Discrepancy Comparisons						
Process Comparison	Score 1	Score 2	Diff.	Critical Value .05	Sign. Diff. Y / N	Base Rate
BD - BDN	12	11	1	3.08	N	21.5
DSF - DSB	8	9	-1	3.65	N	46.8
DSF - DSS	8	9	-1	3.6	N	45.2
DSB - DSS	9	9	0	3.56	N	
LDSF - LDSB	6	5	1	--	--	87
LDSF - LDSS	6	7	-1	--	--	26
LDSB - LDSS	5	7	-2	--	--	44

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### Digit Span: Cognitive Processes

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The shift from one Digit Span task to another requires cognitive flexibility and mental alertness.

- ♦ *Digit Span Forward* involves rote learning and memory, attention, encoding, and auditory processing.
- ♦ *Digit Span Backward* involves working memory, transformation of information, mental manipulation, and visuospatial imaging.
- ♦ *Digit Span Sequencing* is similar to other tasks that are designed to measure working memory and mental manipulation.

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### VCI: Strengths and Needs

Seven's performance on the verbal subtests contributing to the VCI presents a diverse set of verbal abilities. He performed much better on some verbal tasks than others.

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### VCI: Strengths and Needs

The degree of variability is unusual and may be noticeable to those who know him well. Examination of Seven's performance on individual subtests provides additional information regarding his specific verbal abilities.

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### VCI: Functional Implication

- ◆ Seven may exhibit inconsistent performance when solving problems requiring verbal processes.
- ◆ His performance may depend on specific task demands, such as intact language production (e.g., I < C and V), abstract reasoning (e.g., I < S), and response precision.

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### VCI : Further Assessment

The clinical relevance of this finding should be addressed in terms of

- demands in Seven's current environment,
- any co-occurring physical factors (e.g., recent onset of visual or auditory acuity difficulties or physical impairments) or emotional status (e.g., depression, anxiety).

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### VCI : Vocabulary

- ♦ Seven achieved his best performance among the verbal reasoning tasks on the Vocabulary subtest (scaled score = 16).
- ♦ His performance on V suggests well-developed verbal comprehension abilities, ability to verbalize meaningful concepts, and ability to retrieve information from LTM.

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### WMI : Strengths and Needs

Seven's abilities to sustain attention, concentrate, and exert mental control are a weakness relative to his nonverbal and verbal reasoning abilities.

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### WMI : Functional Implication

A weakness in mental control may make the processing of complex information more *time-consuming* for Seven, *draining* his *mental energies* more quickly as compared to others at his level of ability, and perhaps result in *more frequent errors* on a variety of learning or complex work tasks.

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### WMI : Clinical Review

- ◆ Seven's performance on the Working Memory Index is a weakness relative to his performance on other indexes.
- ◆ This score may indicate poor working memory abilities.
- ◆ Consider other possible reasons for poor performance - poor vigilance, poor sequential reasoning, or poor number or letter skills.

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### Individuals with ADHD

Executive functioning deficits have been identified with the most consistent findings related to

- response inhibition,
- sustained attention,
- working memory, and
- planning

(Willcutt, Doyle, Nigg, Faraone, & Pennington, 2005).

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### Individuals with ADHD

Processing speed deficits are also commonly reported in studies of ADHD.

(Frazier, Demaree, & Youngstrom, 2004; Nigg et al., 2005).

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### Individuals with ADHD

Additional cognitive deficits have been identified including

- verbal working memory (Muir-Broaddus, Rosenstei, Medina, & Soderberg, 2002),
- single-trial learning deficits for word lists (Marchetta, Hurks, Krabbendam, & Jolles, 2008),
- story recall (Muir-Broaddus et al., 2002), and
- CVLT List Learning (e.g., Muir-Broaddus et al., 2002).

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### WAIS-IV Clinical Studies: ADHD

Composite	Clinical Mean	Control Mean	Mean Diff.	p value	Effect Size
VCI	100.9	102.8	1.93	.51	.12
PRI	98.6	103.4	4.82	.08	.34
WMI	94.7	100.6	5.91	.02	.43
PSI	94.0	100.4	6.36	.01	.49
FSIQ	96.9	102.4	5.52	.02	.39

n = 44 (ages 18-31)

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**Questions**

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- ◆ How does the relative weakness in working memory affect Seven's learning?
  - Attention/Focus?
  - Effort/Recruitment of resources?
- ◆ Is the relative weakness modality specific?

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**WAIS-IV and Learning**

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Further assessment of memory and perhaps elements of attention and executive functioning is necessary to determine if the identified weakness in encoding of verbal information is a real weakness.

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**WMS-IV Scores: AMI**

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<i>Index/Subtest</i>	<i>Composite Score/ Scaled Score</i>	<i>Index/Subtest</i>	<i>Composite Score/ Scaled Score</i>
<b>Auditory Memory</b>	<b>100</b>	<b>Visual Working Memory</b>	<b>112</b>
Logical Memory I	13	Spatial Addition	11
Logical Memory II	15	Symbol Span	13
Verbal Paired Associates I	5		
Verbal Paired Associates II	7		

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### Auditory Memory

Ability to listen to oral information, repeat it immediately, and then recall the information after a 20 to 30 minute delay is within the Average range.

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### Subtest-Level Differences

Auditory Memory Index

Subtest	Scaled Score	AMI Mean Score	Diff. from Mean	Critical Value	Base Rate
Logical Memory I	13	10.00	3.00	2.64	5-10%
Logical Memory II	15	10.00	5.00	2.48	1%
Verbal Paired Associates I	5	10.00	-5.00	1.90	<1%
Verbal Paired Associates II	7	10.00	-3.00	2.48	10%

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### Subtest-Level Differences

- His ability to recall verbal information that is conceptually organized and semantically related immediately after hearing it and after a delay is a relative strength.
- His ability to immediately learn verbal associations over multiple exposures and to recall these after a delay is a relative weakness.

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### Ability-Memory Analysis: AMI

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Ability Memory Analysis: GAI = 121						
Predicted Difference Method						
Index	Predicted WMS-IV Index Score	Actual WMS-IV Index Score	Diff.	Critical Value	Sign. Diff. Y / N	Base Rate
Auditory Memory	111	100	11	10.3	Y	20%
Contrast Scaled Score						
Score	Score 1	Score 2	Contrast Scaled Score			
GAI vs. AMI	121	100	8			
VCI vs. AMI	120	100	7			
WMI vs. AMI	95	100	10			

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### Ability-Memory Analysis: AMI

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- Seven's ability to recall information presented orally is below what would be expected, given his general intellectual ability (GAI = 121; AMI = 100). However, such a difference is not rare in general and may not be noticeable to those close to him.
- Seven's ability to recall information presented orally is in the Average range when compared others with similar general intellectual ability (25th percentile). There is no significant difference between his auditory memory and general intellectual functioning (GAI vs. AMI Contrast Scaled Score = 8).

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### Ability-Memory Analysis: AMI

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- Seven's ability to recall information presented orally is in the Low Average range when compared to others with similar verbal comprehension (16th percentile). His auditory memory is lower than expected, given his level of verbal comprehension (VCI vs. AMI Contrast Scaled Score = 7).
- Seven's ability to recall orally presented information is in the Average range when compared to others with similar auditory working memory capacity (50th percentile). There is no significant difference between his auditory memory and auditory working memory (WMI vs. AMI Contrast Scaled Score = 10).

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### Auditory Forgetting and Retrieval

Subtest-Level Contrast Scaled Scores

Score	Score 1	Score 2	Contrast Scaled Score
LM II Recognition vs. LM Delayed Recall	26-50%	15	19
LM Immediate Recall vs. LM Delayed Recall	13	15	14
VPA II Recognition vs. VPA Delayed Recall	3-9%	7	11
VPA Immediate Recall vs. VPA Delayed Recall	5	7	13

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### Auditory Forgetting and Retrieval

Subtest-Level Contrast Scaled Scores indicate:

- Seven has relatively good delayed recall, given his initial level of recall.
- On LM, he demonstrated better free recall than recognition for story details. This is unusual, because most individuals perform better when asked specific questions about a story than when asked to recall story details with no cues.

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### WMS-IV Scores: VWMI

Index/Subtest	Composite Score/ Scaled Score	Index/Subtest	Composite Score/ Scaled Score
<b>Auditory Memory</b>	<b>100</b>	<b>Visual Working Memory</b>	<b>112</b>
Logical Memory I	13	Spatial Addition	11
Logical Memory II	15	Symbol Span	13
Verbal Paired Associates I	5		
Verbal Paired Associates II	7		

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### Ability-Memory Analysis: VWMI

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Ability Memory Analysis: GAI = 121						
Predicted Difference Method						
Index	Predicted WMS-IV Index Score	Actual WMS-IV Index Score	Diff.	Critical Value	Sign. Diff. Y / N	Base Rate
Visual Working Memory	114	112	2	13.76	N	--
Contrast Scaled Score						
Score	Score 1	Score 2	Contrast Scaled Score			
GAI vs. VWMI	121	112	10			
PRI vs. VWMI	115	112	10			
WMI vs. VWMI	95	112	13			

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### Ability-Memory Analysis: VWMI

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Contrast Scores Indicate:

- There is no significant difference between visual working memory and general intellectual functioning (GAI vs. VWMI Contrast Scaled Score = 10) or between working memory capacity for visual information and perceptual reasoning ability (PRI vs. VWMI Contrast Scaled Score = 10).
- Working memory capacity for visual information is somewhat better than expected, given working memory capacity for orally presented information (WMI vs. VWMI Contrast Scaled Score = 13).

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### AMI: Strengths and Needs

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- LM – relative strength; VPA – relative weakness.
- The clinical relevance of this score variability should be addressed in terms of Seven's
  - premorbid abilities,
  - demands in his current environment, and other co-occurring physical factors (e.g., recent onset of auditory acuity difficulties or physical impairments) or
  - emotional status (e.g., depression, anxiety).

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**WMS-IV Clinical Studies: ADHD**

WMS-IV Index	Clinical Mean	Control Mean	Mean Diff.	p value	Effect Size
AMI	96.1	102.4	6.25	.05	0.43
VMI	96.8	106.9	10.10	<.01	0.77
VWMI	98.3	100.3	2.00	.57	0.13
IMI	95.1	104.1	8.97	<.01	0.67
DMI	97.5	106.9	0.47	<.01	0.67
GAI	103.8	103.4	-0.45	.88	-0.03

n = 33 (ages 18-29)

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**Recommendations**

- Seven shows numerous characteristics of attention deficit-hyperactivity disorder; therefore it is recommended that he be medically evaluated. Medication, combined with counseling and home/school interventions, is usually very effective in alleviating the symptoms of this condition.
- It is recommended that Seven be screened by a neuropsychologist to rule out any neurological factors that might underlie his attention and learning difficulties.

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**Recommendations**

Seven may benefit from the following instructional strategies to assist in his attentional difficulties:

- providing outlines, key concepts, and vocabulary prior to lesson preparation;
- breaking lessons into smaller parts and/or increasing the pace of lessons;
- actively involving him in lesson presentation; and
- emphasizing key concepts and material by explicitly attending to them.

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## Recommendations

- Seven may benefit from using associative linkages when encoding information. By linking new information to what has been previously learned, he may be able to gain a more global understanding of the information and improve recall.
- When Seven first encounters new information, he should link it in as many ways as possible to already known information. This strategy creates several avenues for remembering the information later.

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## Recommendations

- Tests for Seven should be structured so that they require recognition rather than recall of information. They should be structured in multiple choice or other selected-response formats, rather than in extended short-answer and essay. Test formats such as these will assist him in retrieving previously learned information.
- Seven should be encouraged to use a "memory book" that would include information such as his daily schedule; important names, addresses, and phone numbers.

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## Summary

- Interpretation should always consider the individual's functional environment.
- Identify the abilities that are necessary for an individual to respond effectively to the demands of the environment.
- Identify the individual's abilities.
- The difference between required abilities and the individual's abilities will direct clinician to interventions.

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Advanced Interpretation of the Wechsler Adult Intelligence Scale-Fourth Edition and the Wechsler Memory Scale-Fourth Edition  
Gloria Maccow, Ph.D., Assessment Training Consultant

**References**

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Frazier, T. W., Demaree, H. A., & Youngstrom, E. A. (2004). Meta-analysis of intellectual and neuropsychological test performance in attention-deficit/hyperactivity disorder. *Neuropsychology, 18*, 543-555.

Marchetta, N. D. J., Hurks, P. P. M., Krabbendam, L., & Jolles, J. (2008). Interference control, working memory, concept shifting, and verbal fluency in adults with attention-deficit/hyperactivity disorder (ADHD). *Neuropsychology, 22*, 74-84.

Muir-Broaddus, J. E., Rosenstei, L. D., Medina, D. E., & Soderberg, C. (2002). Neuropsychological test performance of children with ADHD relative to test norms and parent behavioral ratings. *Archives of Clinical Neuropsychology, 17*, 671-689.

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**References**

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Nigg, J. T., Stavro, G., Ettenhofer, M., Hambrick, D. Z., Miller, T., & Henderson, J. M. (2005). Executive functions and ADHD in adults: Evidence for selective effects on ADHD symptom domains. *Journal of Abnormal Psychology, 114*, 706-717.

Squire, L. R. (1987). *Memory and brain*. New York: Oxford University Press.

Wechsler, D. (1939). *The measurement of adult intelligence*. Baltimore, MD: Williams & Wilkins, p. 229.

Willcutt, E. G., Doyle, A. E., Nigg, J. T., Faraone, S. V., & Pennington, B. F. (2005). Validity of the executive function theory of attention-deficit/hyperactivity disorder: A meta-analytic review. *Biological Psychiatry, 57*, 1336-1346.

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