"Intelligent" intelligence testing with the WJ IV cognitive battery

- WJ IV published & new supplemental/clinical test groupings
- WJ IV assessment trees
  - Within-CHC domain assessment trees ("drilling down")
  - Academic domain referral-focused assessment trees
- Miscellaneous topics and tidbits
- Conclusions and Q/A

WJ IV example case study
(Patrick – 9 years 1 month old Grade 3.6)

Case study provided
By Dr. Nancy Mather

To be included in Alan Kaufman's new WISC-IV book

History or learning problems in reading since starting school.

History of early ear infections and speech and language delays.

Classroom performance and tested reading shows problems in word recognition, reading fluency/speed, and spelling.

Has received significant non-SE tutoring since K in reading (Spalding-intense phonics method).

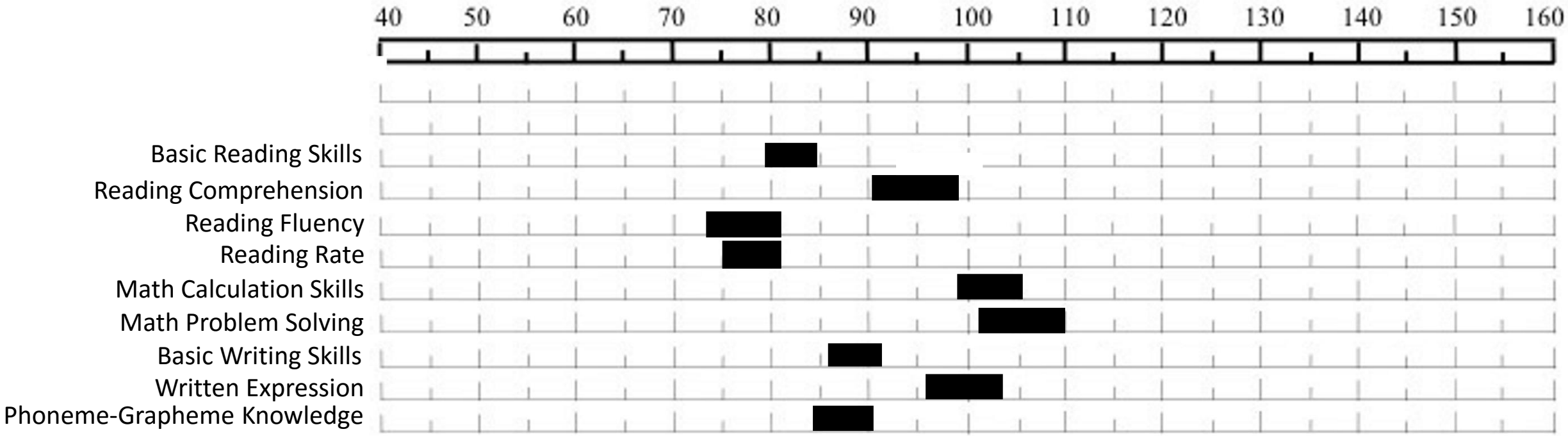
High SES and educated parents.

Problems in paying attention in class. Also difficulty staying in his seat.

Good in mathematics. But in low group. Says math is "too easy"

Avid chess player. Very social.

WJ IV Patrick case study: Select ACH clusters normative comparisons



Intra-ACH Variations Procedure (+-1.5 SD): Patrick case study

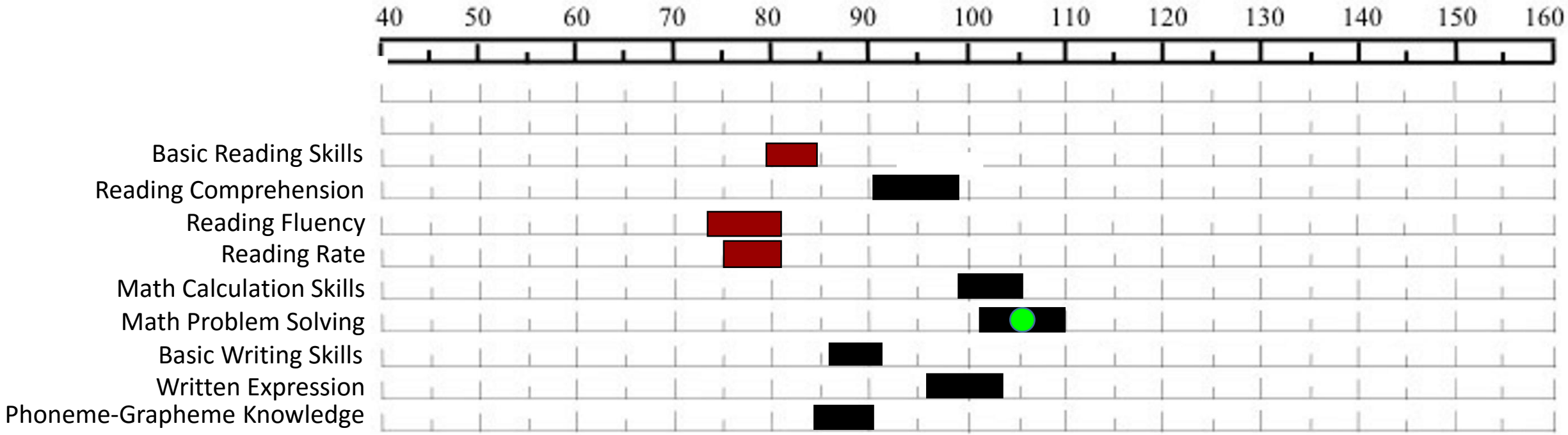
VARIATIONS	STANDARD SCORES Actual	Predicted	Difference	DISCREPANCY PR	SD	Interpretation at + or -1.50 SD (SEE)
Intra-Achievement [Extended] Variations						
BASIC READING SKILLS	82	95	-13	4	-1.72	Weakness
READING COMPREHENSION	95	92	3	62	+0.30	--
READING FLUENCY	77	96	-19	2	-2.12	Weakness
READING RATE	78	94	-16	6	-1.55	Weakness
MATH CALCULATION SKILLS	102	94	8	78	+0.78	--
MATH PROBLEM SOLVING	106	93	13	88	+1.18	--
BASIC WRITING SKILLS	89	94	-5	28	-0.58	--
WRITTEN EXPRESSION	99	92	7	78	+0.78	--
Letter-Word Identification	80	95	-15	3	-1.88	Weakness
Applied Problems	100	92	8	76	+0.70	--

(Continued on next slide)

Intra-ACH Variations Procedure (+-1.5 SD): Patrick case study

Spelling	89	94	-5	28	-0.60	--
Passage Comprehension	95	93	2	58	+0.21	--
Calculation	89	94	-5	31	-0.50	--
Writing Samples	105	93	12	86	+1.06	--
Word Attack	84	96	-12	14	-1.09	--
Oral Reading	87	96	-9	20	-0.83	--
Sentence Reading Fluency	76	94	-18	4	-1.72	Weakness
Math Facts Fluency	112	95	17	93	+1.44	--
Sentence Writing Fluency	94	92	2	55	+0.14	--
Reading Recall	97	95	2	57	+0.16	--
Number Matrices	111	94	17	89	+1.24	--
Editing	88	94	-6	25	-0.68	--
Word Reading Fluency	81	95	-14	10	-1.25	--
Spelling of Sounds	92	95	-3	39	-0.28	--

Significant ACH strengths/weaknesses: Intra-ACH (Extended) variation procedure (+-1.5 SD) – Patrick case study



http://www.iapsych.com/ssprprofile.pdf

Test level weaknesses: Letter-Word Identification; Sentence Reading Fluency, *Word Attack. Word Reading Fluency*

Test level strengths: Math Facts Fluency, *Writing Samples, Number Matrices*

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

Vocabulary (VL) — Picture Vocab. — General Info. / Oral Comp.

Gf — Concept Formation ⊖

Gwm — Numbers Reversed — Under. Directions / Sentence Repetition

List. Comp. (LS)

Causal link?

Glr — Vis. Aud. Lrn.

Speed of Lexical Access (LA) — Retrieval Fluency — Rapid Pic. Nam.

Speed of lexical access-Ext (LA-Ext)

Ga — Nonword Repetition — Segmen-tation

Phonetic Coding (PC) — Sound Blending

Perceptual Speed (P) — Number-Pattern Matching ⊖

Gc Gc-Ext — General Info.

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

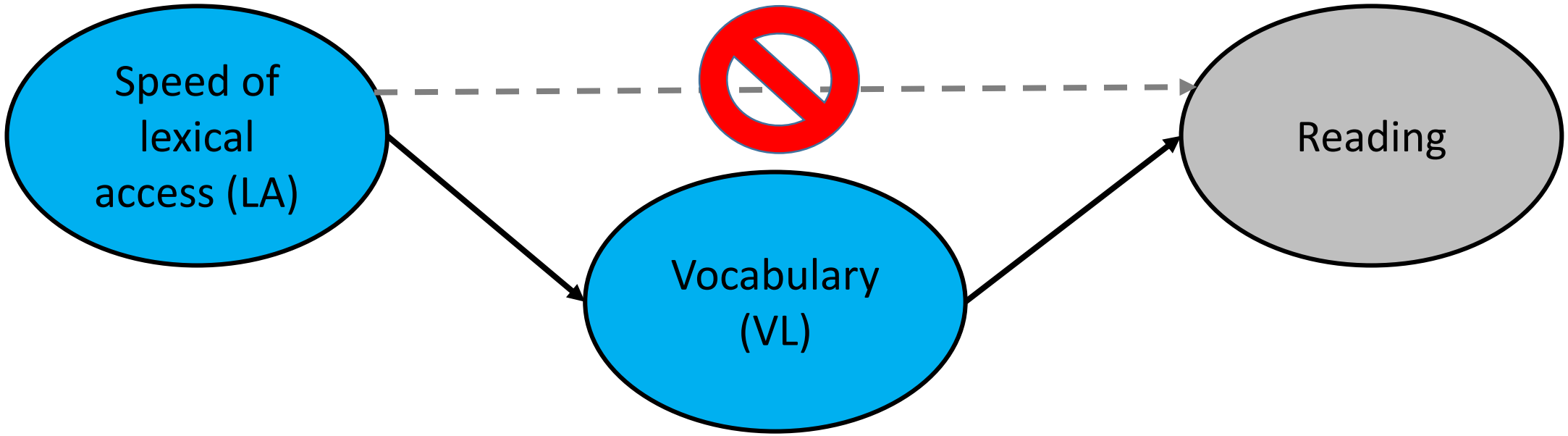
Low

Effect	Coefficient	Standard Error	Std. Coefficient	Tolerance	t	p-Value
CONSTANT	13.80	1.55	0.00	.	8.93	0.00
GF	0.21	0.01	0.21	0.62	14.38	0.00
GA	0.26	0.01	0.26	0.64	18.00	0.00
GLR	0.18	0.01	0.18	0.71	13.14	0.00
SPDLEX	**0.22**	0.01	0.22	0.80	17.31	0.00

Ages 6 to 19 – broad and narrow CHC clusters as predictors of Vocabulary cluster (no Gc due to Vocab being dep. Variable)

Dependent Variable	**VOCAB**
N	4,212
Multiple R	**0.66**
Squared Multiple R	0.44
Adjusted Squared Multiple R	0.44
Standard Error of Estimate	11.65

Hypothesized causal relations between vocabulary, speed of lexical access, and reading achievement – research in process



Ho: Effect of speed of lexical access (LA) on reading achievement is indirect (moderated via vocabulary-VL)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

Vocabulary (VL) → Picture Vocab.

Gf → Concept Formation ⊖

Perceptual Speed (P) → Number-Pattern Matching ⊖

High

Strength

.60	.91 .56 M .77	.89 .49 L .60	.85 .53 M .80
Gs	**LtPMat**	**PairCn**	**NmPMat**
	H (P)	H (P/AC)	H (P)
	.46 .55 .48	.30 .44 .28	.53 .57 .61

(ages 6 to 19)

Low

The bandwith-fidelity trade off or dilemma (Cronbach, 1960)

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

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The primary action is at the narrow ability level

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

DOI: 10.1002/pits.20497

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

KEVIN S. McGREW AND BARBARA J. WENDLING

Woodcock-Muñoz Foundation

Contemporary Cattell–Horn–Carroll (CHC) theory of cognitive abilities has evolved over the past 20 years and serves as the theoretical foundation for a number of current cognitive ability assessments. CHC theory provides a means by which we can better understand the relationships between cognitive abilities and academic achievement, an important component of learning disabilities identification and instructional planning. A research synthesis of the extant CHC cognitive-achievement (COG-ACH) research literature is reported. Systematic and operationally defined research synthesis procedures were employed to address limitations present in the only prior attempted synthesis. Nineteen studies met the criteria for inclusion, which yielded 134 analyses. The 134 analyses were organized by three age groups (6–8, 9–13, and 14–19) and by four achievement domains (basic reading skills, reading comprehension, basic math skills, and math reasoning). The results reveal a much more nuanced set of CHC COG-ACH relations than was identified in the only prior review because of (a) breadth of cognitive abilities and measures (broad vs. narrow), (b) breadth of achievement domains (e.g., basic reading skills and reading comprehension vs. broad reading), and (c) developmental (age) status. The findings argue for selective, flexible, and referral-focused intelligence testing, particularly in the context of emerging Response to Intervention (RTI) assessment models. The results suggest that narrow CHC abilities should be the primary focus of instructionally relevant intelligence testing. Furthermore, the finding that more than 90% of the available research is based on the Woodcock–Johnson Battery argues for significant caution in generalizing the findings to other batteries. CHC-based COG-ACH research with other intelligence batteries is recommended. © 2010 Wiley Periodicals, Inc.

The bandwith-fidelity dilemma or trade-off (Cronbach, 1960)

WJ IV CHC broad and narrow ability clusters

Fld Reas (2)	Cmp Knw(2)	ST Work Mem (2)	Cog Proc Speed(2)	Aud Proc (2)	LT Ret (2)	Visual Proc (2)
Fld Reas (3)	Cmp Knw(3)	ST Work Mem (3)				

Broad CHC ability clusters (10)

Qnt Reas RQ (2)	Vocab VL (2)	AMemSp MS (2)	Perc Spd P (2)	Phn Cod PC (2)	SpLex Ac LA (2)
	List Cmp LS (2)	Num Fac N (2)			

Narrow CHC ability clusters (8)

Sometimes narrow is better than broad

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

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Ga — Nonword Repetition — Segmen-tation

Phonetic Coding (PC) — Sound Blending

Perceptual Speed (P) — Number-Pattern Matching ⊖

Gc / ***Gc-Ext***

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
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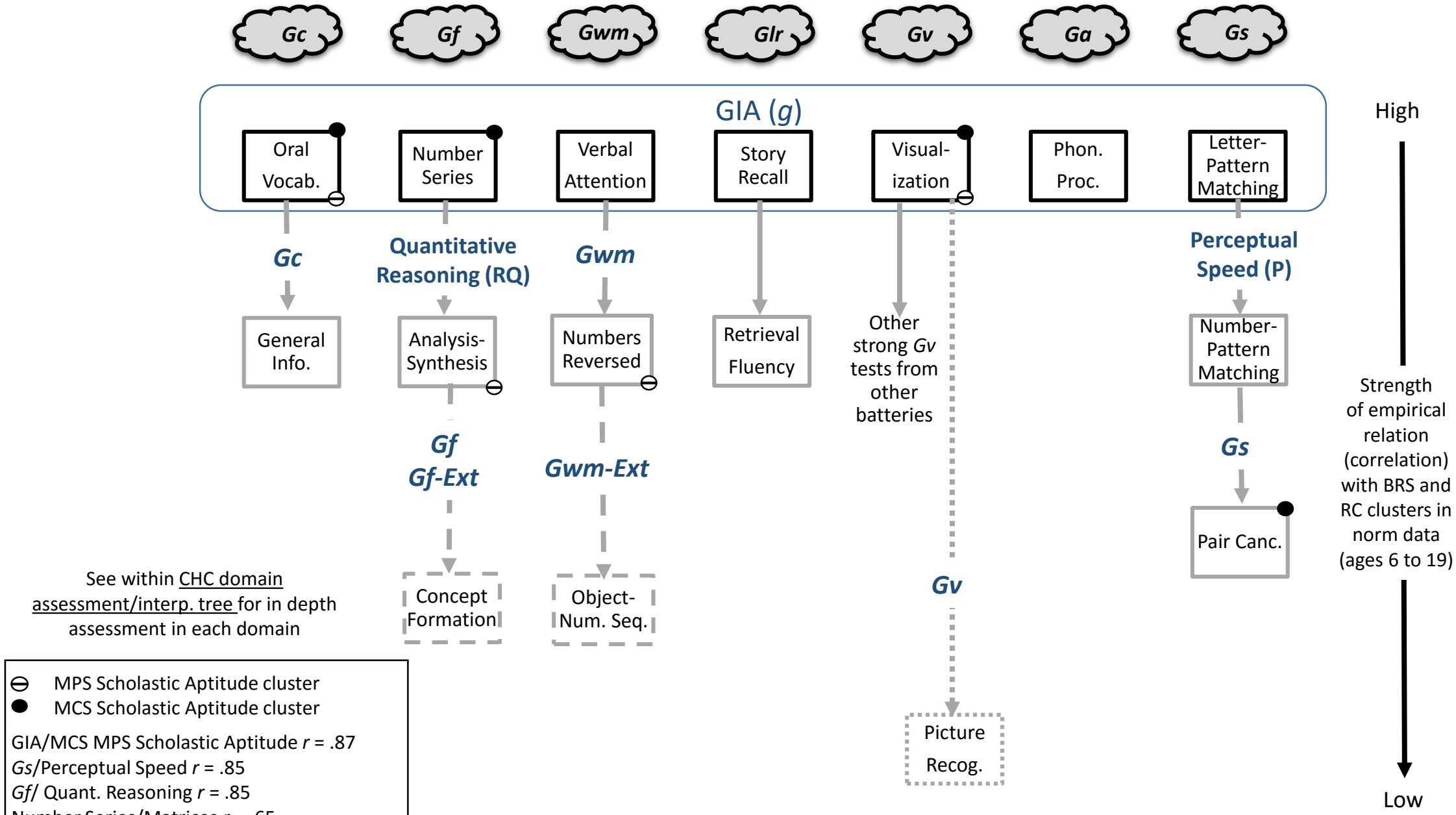
WJ IV Math Calculation Skills and Problem Solving – GIA+cluster *ach-domain* tree

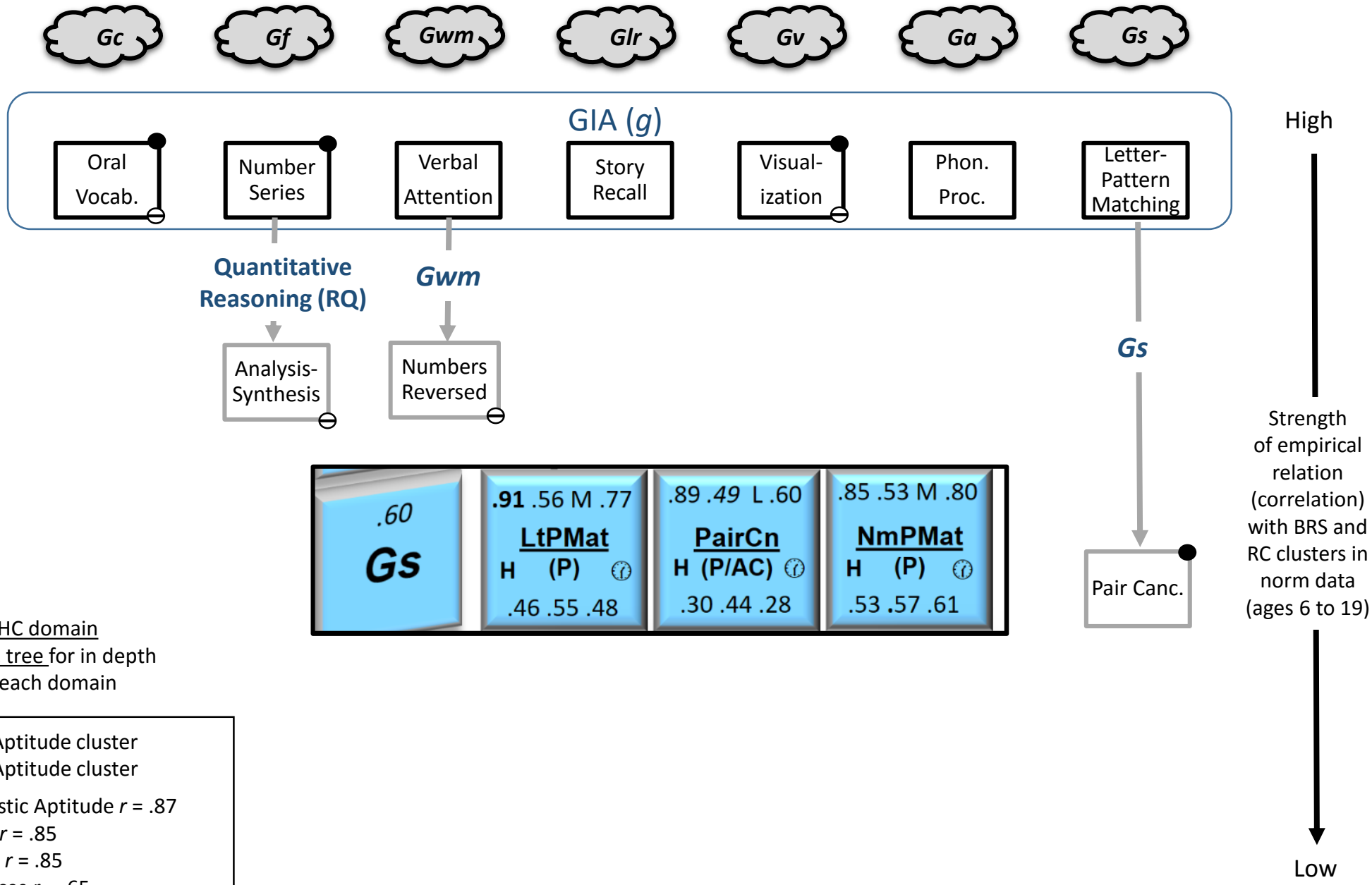


See within CHC domain assessment/interp. tree for in depth assessment in each domain

⊖ MPS Scholastic Aptitude cluster
● MCS Scholastic Aptitude cluster

GIA/MCS MPS Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gf/ Quant. Reasoning *r* = .85
Number Series/Matrices *r* = .65

WJ IV Math Calculation Skills and Problem Solving – GIA+cluster *ach-domain* tree



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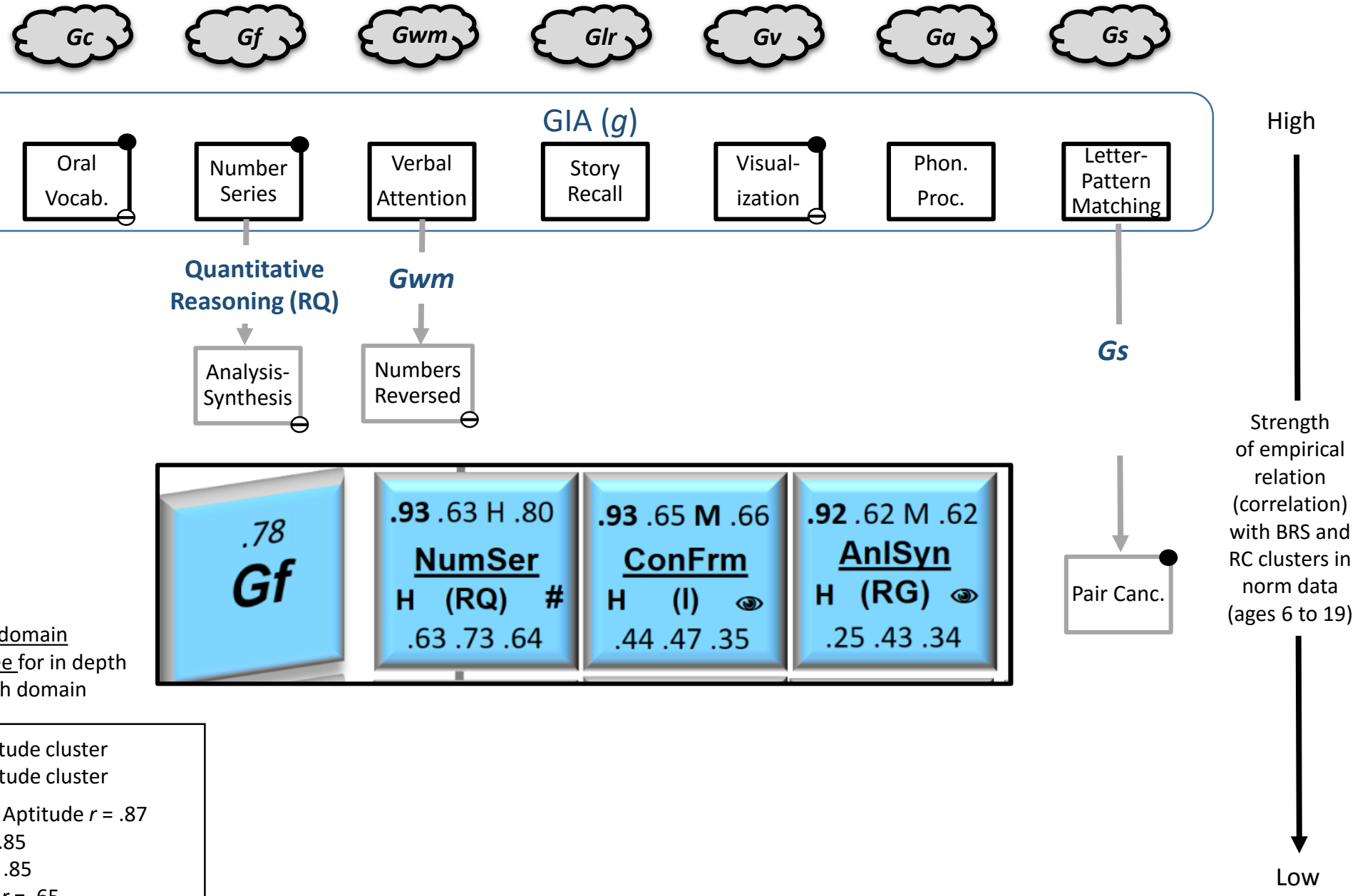

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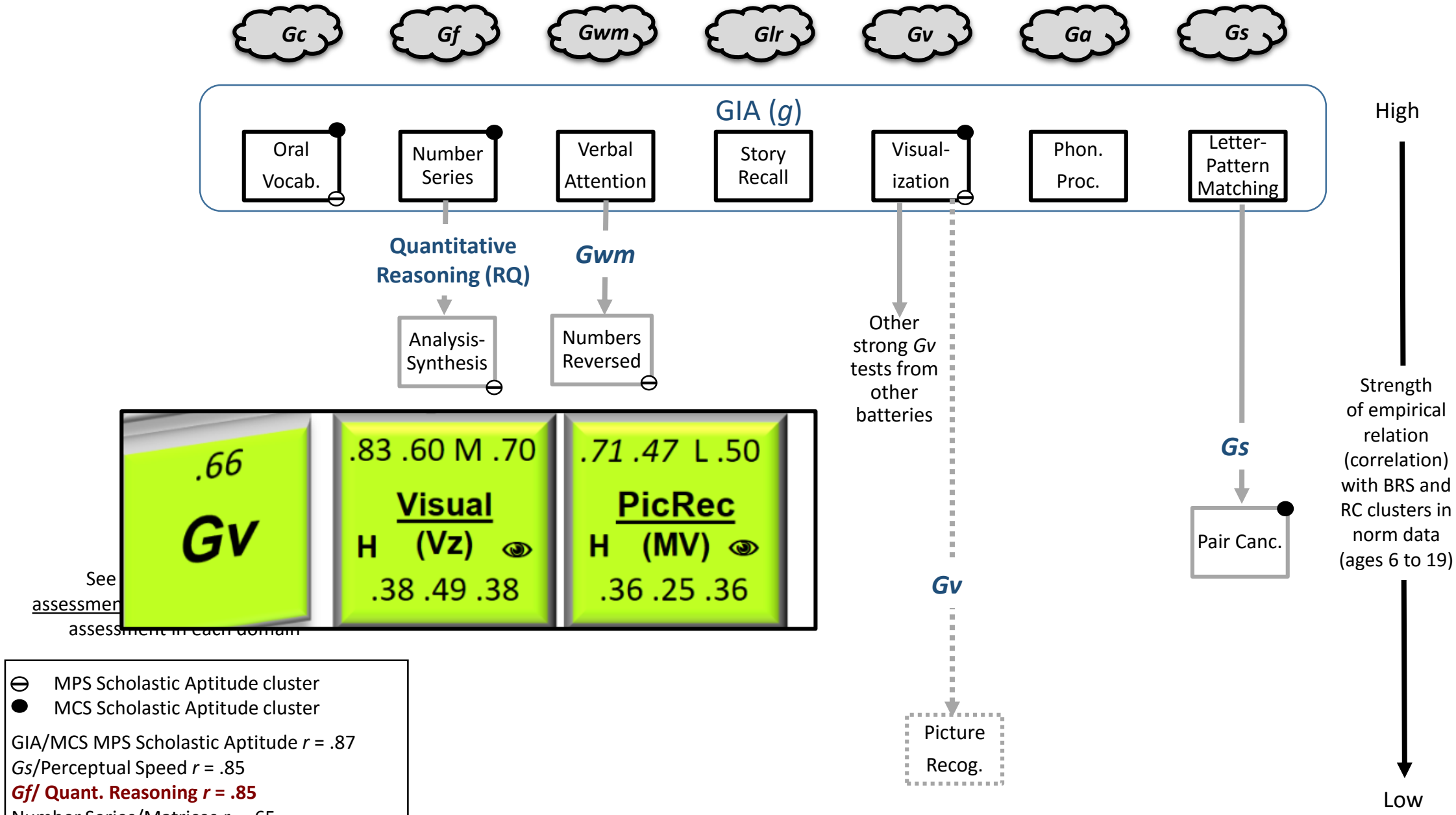
WJ IV Math Calculation Skills and Problem Solving – GIA+cluster *ach-domain* tree



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● MCS Scholastic Aptitude cluster

GIA/MCS MPS Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
***Gf*/ Quant. Reasoning *r* = .85**
Number Series/Matrices *r* = .65

Reading primary concern

The following slides will illustrate the GIA+cluster (Core+) and within-CHC domain assessment trees

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc	Gf	Gwm	Glr	Gv	Ga	Gs	GIA
+2.36	+1.35	-0.76	-1.14	+1.45	-1.37	-1.92	94
119 98/90	111 97/90	89 71/90	85 76/90	114 97/90	83 69/90	75 9/90	80/90
Oral Vocab.	Number Series	Verbal Attention	Story Recall	Visual-ization	Phon. Proc.	Letter-Pattern Matching	

Quantitative Reasoning (RQ)

108 97/90

Concept Formation

+1.07

Perceptual Speed (P)

80 8/90

Number-Pattern Matching

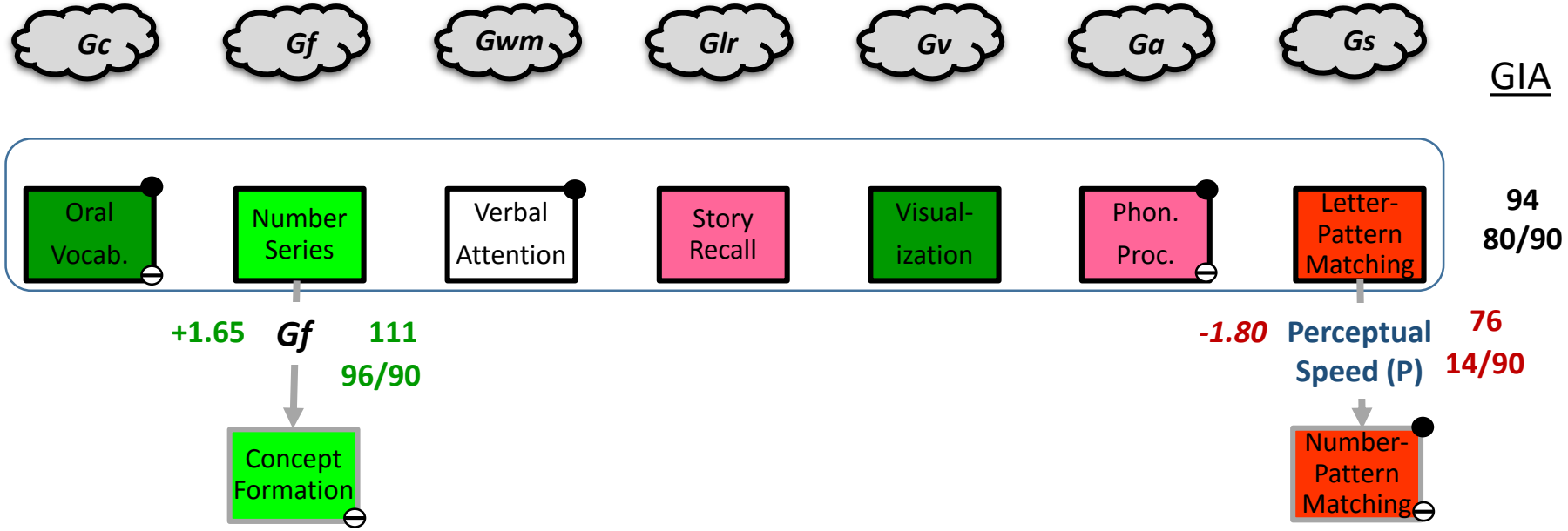
-1.49

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster	85
⊖ RC Scholastic Aptitude Cluster	91

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree



See within CHC domain assessment/interp. tree for in depth assessment in each domain

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⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
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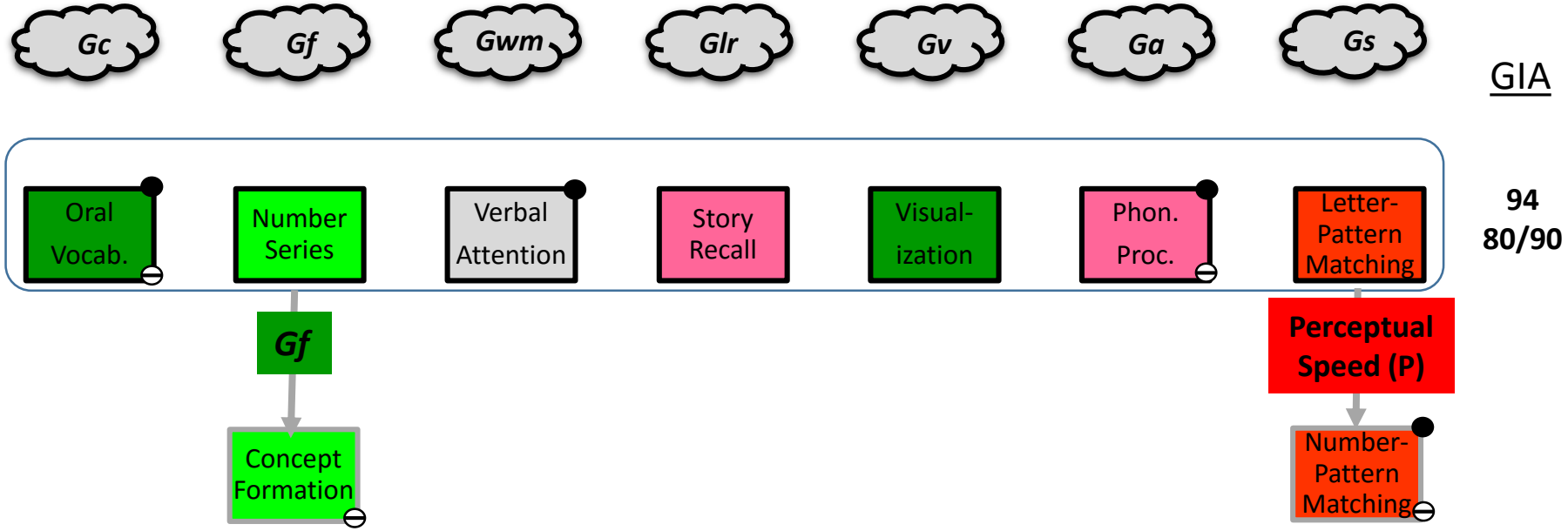
Gc/Vocabulary *r* = .89

85 (-9 from GIA)
91 (-3 from GIA)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree



See within CHC domain assessment/interp. tree for in depth assessment in each domain

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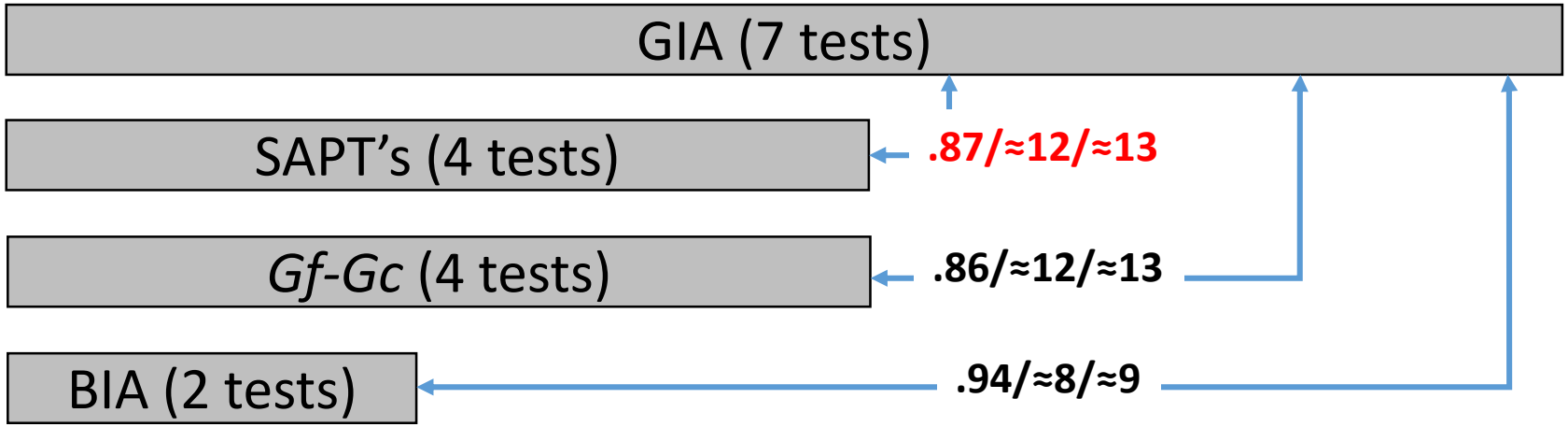
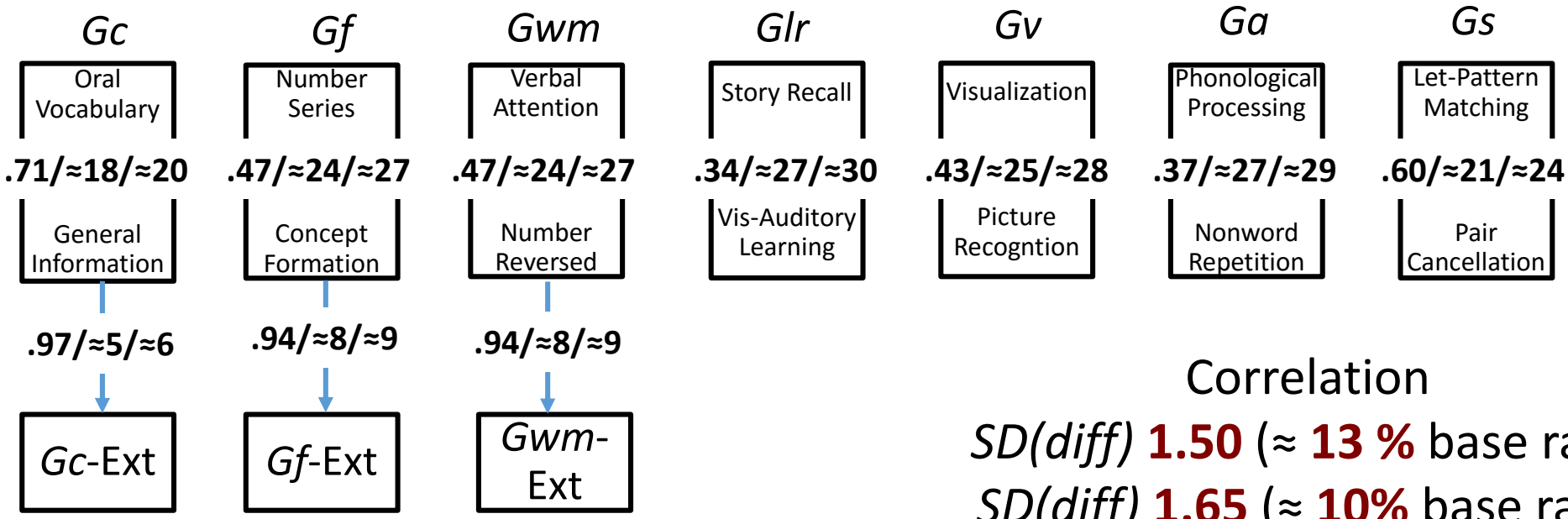
Gc/Vocabulary *r* = .89

85 (-9 from GIA)
91 (-3 from GIA)

Select WJ IV COG cluster/test score significance values (ages 6-19) *



* Rounded values calculated in WJ IV norm data (ages 6 to 19)

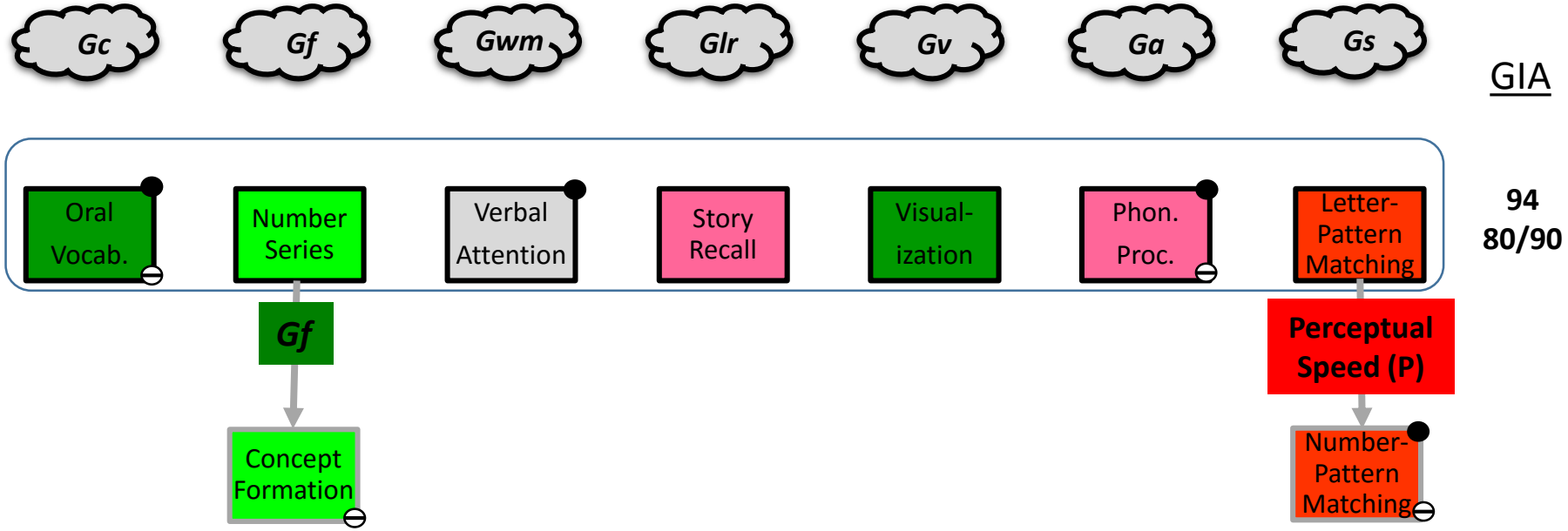


Correlation

SD(diff) **1.50** (≈ **13 %** base rate)

SD(diff) **1.65** (≈ **10%** base rate)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree



See within CHC domain assessment/interp. tree for in depth assessment in each domain

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⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

85 (-9 from GIA)

91 (-3 from GIA)

Within CHC-domain assessment trees: Drilling down into CHC domains

Key to the following slides

Gray shaded CHC domain – primary assessment domain

Dark lines with bold fonts = WJ IV published clusters

Dashed lines with regular fonts = clinical/supplemental test groupings

Dark outlined squares = COG/OL tests: Gray outlined squares = ACH tests

See document with all broad and narrow published and clinical groupings

(www.iapsych.com/articles/wjivgroupings.pdf)

WJ IV author provided and supplemental/clnical groupings or clusters to consider

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CHC domain*	Narrow CHC (or other) ability	WJ IV tests
Gc	*Gc* - **Comprehension-Knowledge**	Oral Vocabulary, General Information
	Gc-Ext: **Comprehension-Knowledge - Extended**	Oral Vocabulary, General Information , Picture Vocabulary
	Lexical Knowledge (VL) - **Vocabulary**	Oral Vocabulary, Picture Vocabulary
	Lexical Knowledge (VL) / Vocabulary-Extended	Oral Vocabulary, Picture Vocabulary, Reading Vocabulary, Rapid Picture Naming?
	Listening Ability (LS) - **Listening Comprehension**	Oral Comprehension, Understanding Directions
	Listening ability (LS) - Extended	Oral Comprehension, Understanding Directions, Story Recall
	General (verbal) information (K0)	General Information, Picture Vocabulary
	General (verbal) information (K0) - Extended	General Information, Picture Vocabulary, Science, Social Studies, Humanities
	Knowledge of culture (K2)	General Information, Picture Vocabulary, Humanities
	Language development (LD)	Oral Vocabulary, Oral Comprehension, Reading Vocabulary, Passage Comprehension
	Receptive & Expressive Language	Oral Comprehension, Story Recall, Understanding Directions, Memory for Sentences
Gf	*Gf* - **Fluid Reasoning**	Number Series, Concept Formation
	Gf-Ext: **Fluid Reasoning - Extended**	Number Series, Concept Formation, Analysis-Synthesis
	Quantitative reasoning (RQ) - **Quant. Reasoning**	Number Series, Analysis-Synthesis
	Quantitative reasoning (RQ) - Extended	Number Series, Analysis-Synthesis, Number Matrices, Applied Problems
	Verbal reasoning (*Gf*-Verbal)	Concept Formation, Analysis-Synthesis, Oral Vocabulary, Passage Comprehension
	Gf-Extended 4; *Gf*+*Gv* hybrid	Number Series, Concept Formation, Analysis-Synthesis, Visualization
Gwm	*Gwm* - **Short-term Working Memory**	Verbal Attention, Numbers Reversed

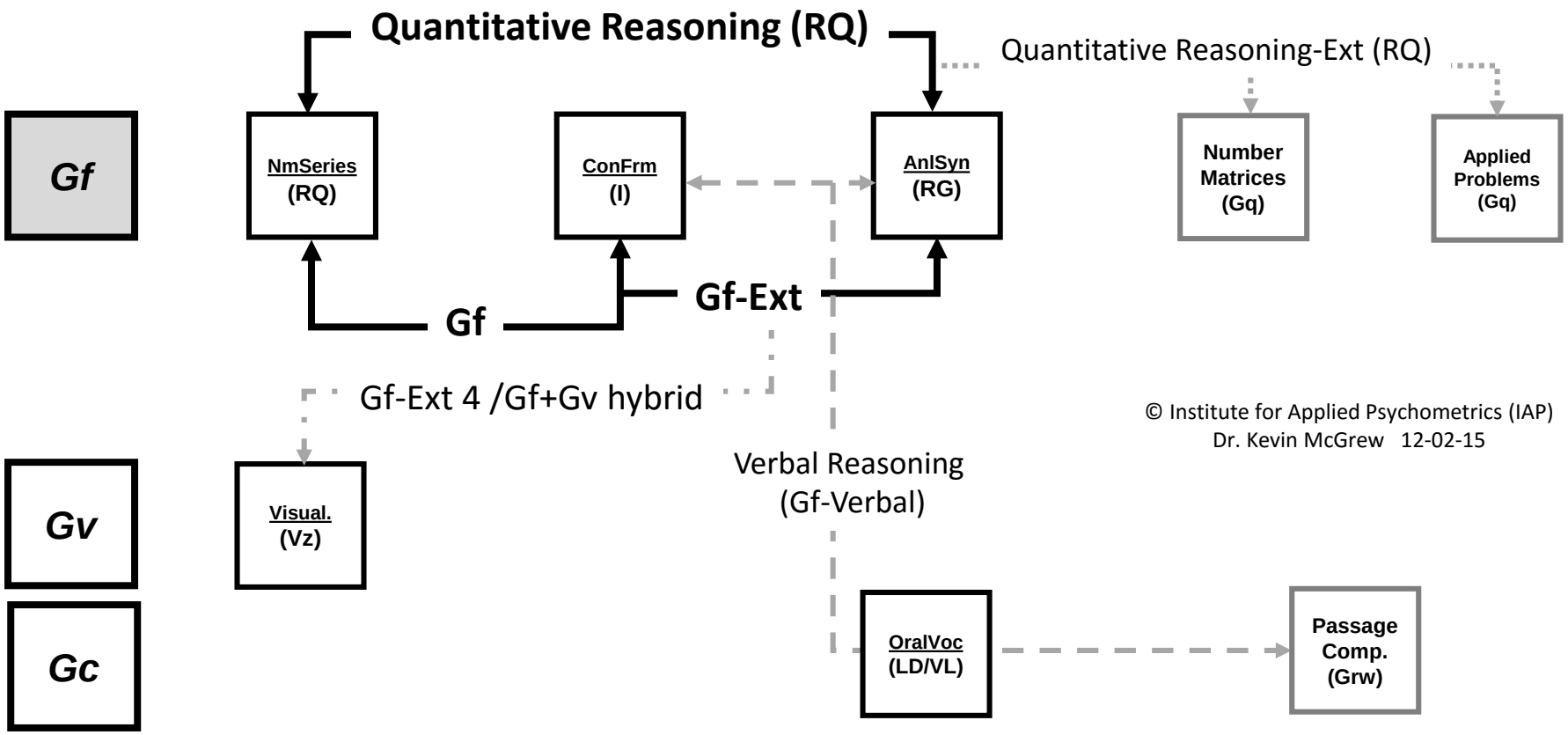
Within CHC-domain assessment and interpretation trees: Purpose/Uses

- Select tests to investigate S/W hypotheses

- Post assessment—record results on trees to possibly identify S/W patterns

(PDF copies of the "WJ IV intelligent testing trees" available for printing @ www.iapsych.com/articles/wjivtrees1.pdf)

Within CHC domain assessment & interpretation tree - *Gf*



Within CHC domain assessment & interpretation tree - *Gf*

110
96/90
+1.62

Quantitative Reasoning (RQ)

Quantitative Reasoning-Ext (RQ)

+1.24

+0.73

+1.35

+1.07

+1.01

Gf

111 NmSeries (RQ) 97/90

108 ConFrm (I) 97/90

107 AnlSyn (RG) 96/90

111 Number Matrices (Gq) 97/90

100 Applied Problems (Gq) 90/90

111
96/90
Gf
+1.65

111
96/90
Gf-Ext
+1.76

Gf-Ext 4 /Gf+Gv hybrid

Gv

114 Visual. (Vz) 97/90

+1.45

Verbal Reasoning
(Gf-Verbal)

Gc

119 OralVoc (LD/VL) 98/90

+2.36

95 Passage Comp. (Grw) 80/90

+0.21

Within CHC domain assessment & interpretation tree - *Gf*

Gf

Gv

Gc

Quantitative Reasoning (RQ)

NmSeries (RQ)

ConFrm (I)

AnlSyn (RG)

Gf

Gf-Ext

Gf-Ext 4 /Gf+Gv hybrid

Visual. (Vz)

Verbal Reasoning (Gf-Verbal)

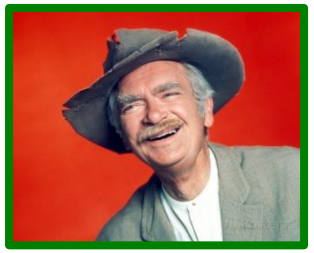
OralVoc (LD/VL)

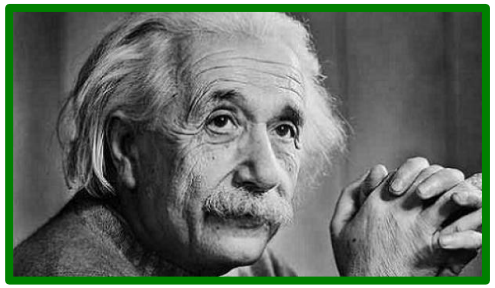
Passage Comp. (Grw)

Quantitative Reasoning-Ext (RQ)

Number Matrices (Gq)

Applied Problems (Gq)





WISC-V

FRI = 112

MR = 11

FW = 13

Dr. Kevin McGrew 01-26-16

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

94
80/90

High

Gf → Concept Formation ⊖

Perceptual Speed (P) → Number-Pattern Matching ⊖

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

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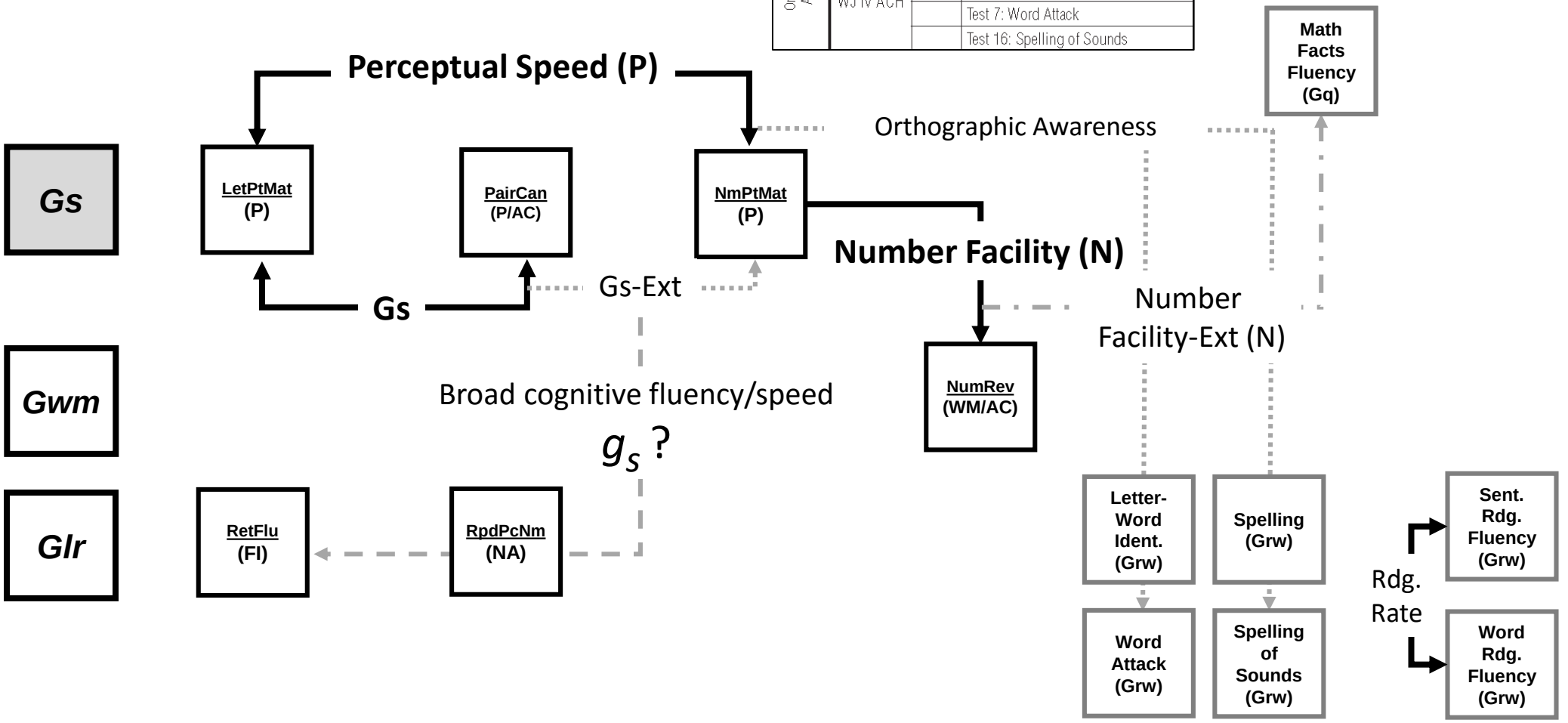
85 (-9 from GIA)
91 (-3 from GIA)

Within CHC domain assessment & interpretation tree - *Gs*

Dr. Kevin McGrew 12-02-15

Orthographic Awareness	WJ IV COG		Test 4: Letter-Pattern Matching
			Test 11: Number-Pattern Matching
	WJ IV ACH		Test 1: Letter-Word Identification
			Test 3: Spelling
			Test 7: Word Attack
			Test 16: Spelling of Sounds



Within CHC domain assessment & interpretation tree - *Gs*

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-1.80 76 14/90

Perceptual Speed (P)

-1.92 | -1.34 | -1.49

75 LetPtMat (P) 9/90

82 PairCan (P/AC) 22/90

80 NmPtMat (P) 8/90

Orthographic Awareness

+1.44 112 99/90 Math Facts Fluency (Gq)

Gs

Gs -1.80 76

Gs-Ext

Number Facility (N)

Number Facility-Ext (N)

NumRev (WM/AC)

Broad cognitive fluency/speed

g_s ?

Gwm

Glr

RetFlu (Fl)

RpdPcNm (NA)

-1.88 80 14/90 Letter-Word Ident. (Grw)

-0.60 89 59/90 Spelling (Grw)

-1.09 84 55/90 Word Attack (Grw)

-0.28 92 80/90 Spelling of Sounds (Grw)

-1.55 Sent. Rdg. Fluency (Grw) -1.72 76 1/90

Rdg. Rate 78 2/90

Word Rdg. Fluency (Grw) -1.25 81 4/90

Within CHC domain assessment & interpretation tree - *Gs*

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Orthographic Awareness	WJ IV COG		Test 4: Letter-Pattern Matching
			Test 11: Number-Pattern Matching
	WJ IV ACH		Test 1: Letter-Word Identification
			Test 3: Spelling
			Test 7: Word Attack
			Test 16: Spelling of Sounds

Perceptual Speed (P)

Gs

LetPtMat (P)

PairCan (P/AC)

NmPtMat (P)

Orthographic Awareness

Math Facts Fluency (Gq)

Number Facility (N)

Gs

Gs-Ext

Number Facility-Ext (N)

Gwm

NumRev (WM/AC)

Broad cognitive fluency/speed

g_s ?

Glr

~~**RetFlu (Fl)**~~

RpdPcNm (NA)

Letter-Word Ident. (Grw)

Spelling (Grw)

Word Attack (Grw)

Spelling of Sounds (Grw)

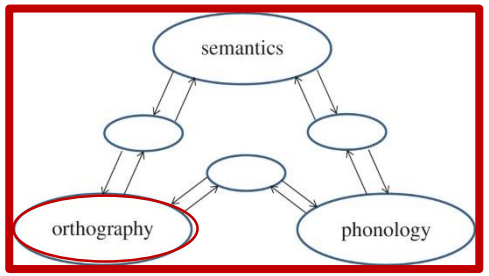
Rdg. Rate

Sent. Rdg. Fluency (Grw)

Word Rdg. Fluency (Grw)

Within CHC domain assessment & interpretation tree - *Gs*

Dr. Kevin McGrew 01-26-16



Gs

Gwm

Glr

Perceptual Speed (P)

LetPtMat (P)

PairCan (P/AC)

NmPtMat (P)

Gs

Gs-Ext

Orthographic Awareness

Math Facts Fluency (Gq)

Number Facility (N)

Number Facility-Ext (N)

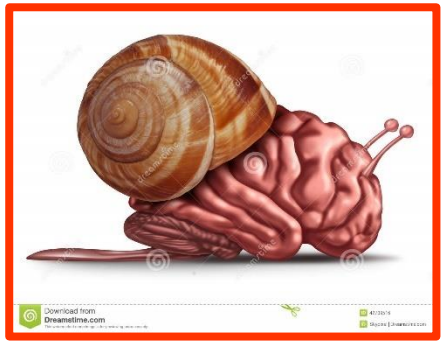
NumRev (WM/AC)

Broad cognitive fluency/speed

g_s ?

~~RetFlu (Fl)~~

RpdPcNm (NA)



WISC-V

PSI = 78

CD = 6

SS = 5

Letter-Word Ident. (Grw)

Spelling (Grw)

Word Attack (Grw)

Spelling of Sounds (Grw)

Rdg. Rate

Sent. Rdg. Fluency (Grw)

Word Rdg. Fluency (Grw)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

Oral Vocab. ⊖ | Number Series | Verbal Attention ● | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

94
80/90

High

Gf

Concept Formation ⊖

Perceptual Speed (P)

Number-Pattern Matching ⊖

Gs

Pair Canc.

Ortho. Aware.

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

85 (-9 from GIA)
91 (-3 from GIA)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

Vocabulary (VL)

- Picture Vocab.
- ***Gc Gc-Ext*** → General Info.
- Oral Comp.
- **List. Comp. (LS)** → Under. Directions

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

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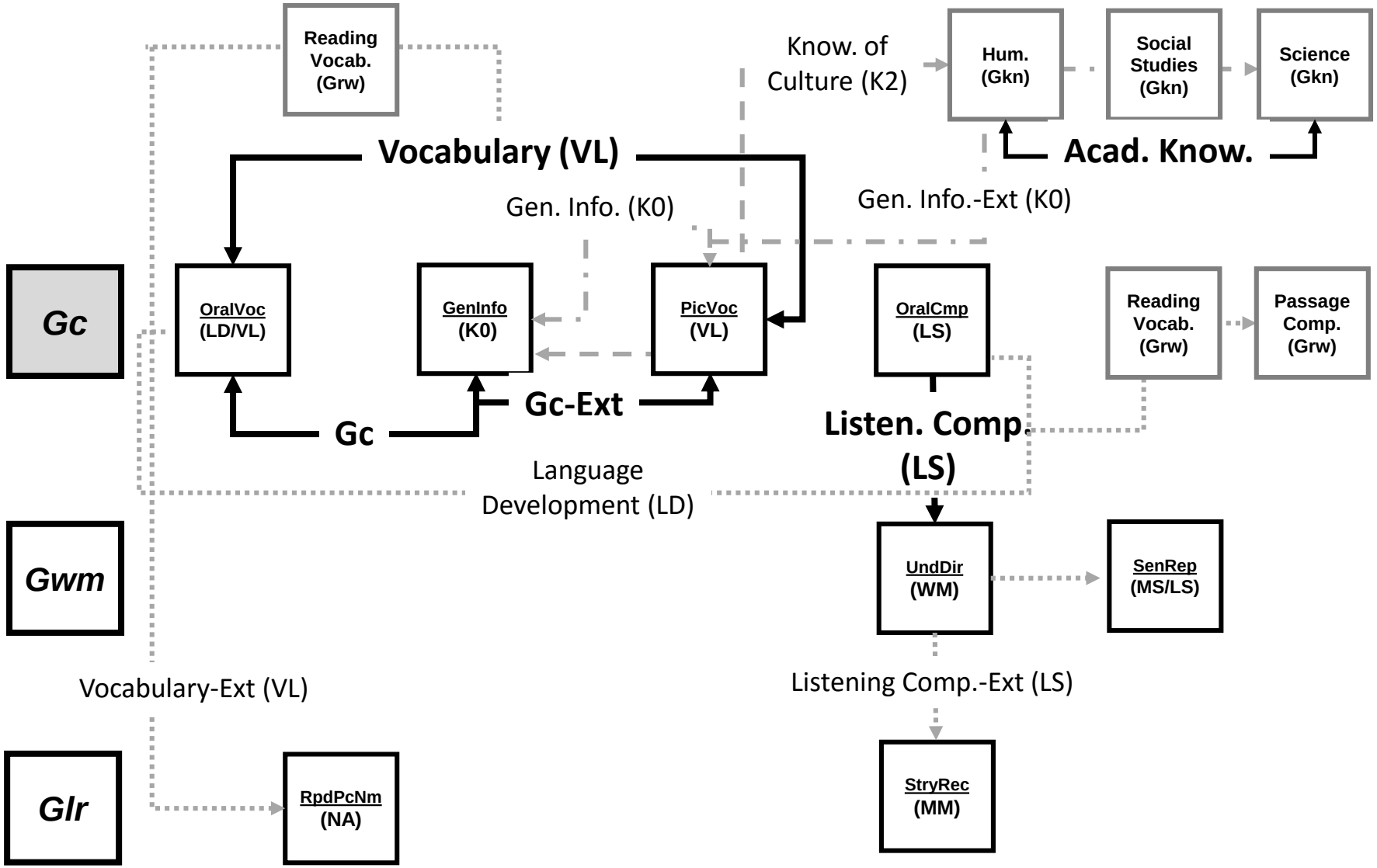
High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

Within CHC domain assessment & interpretation tree - *Gc*



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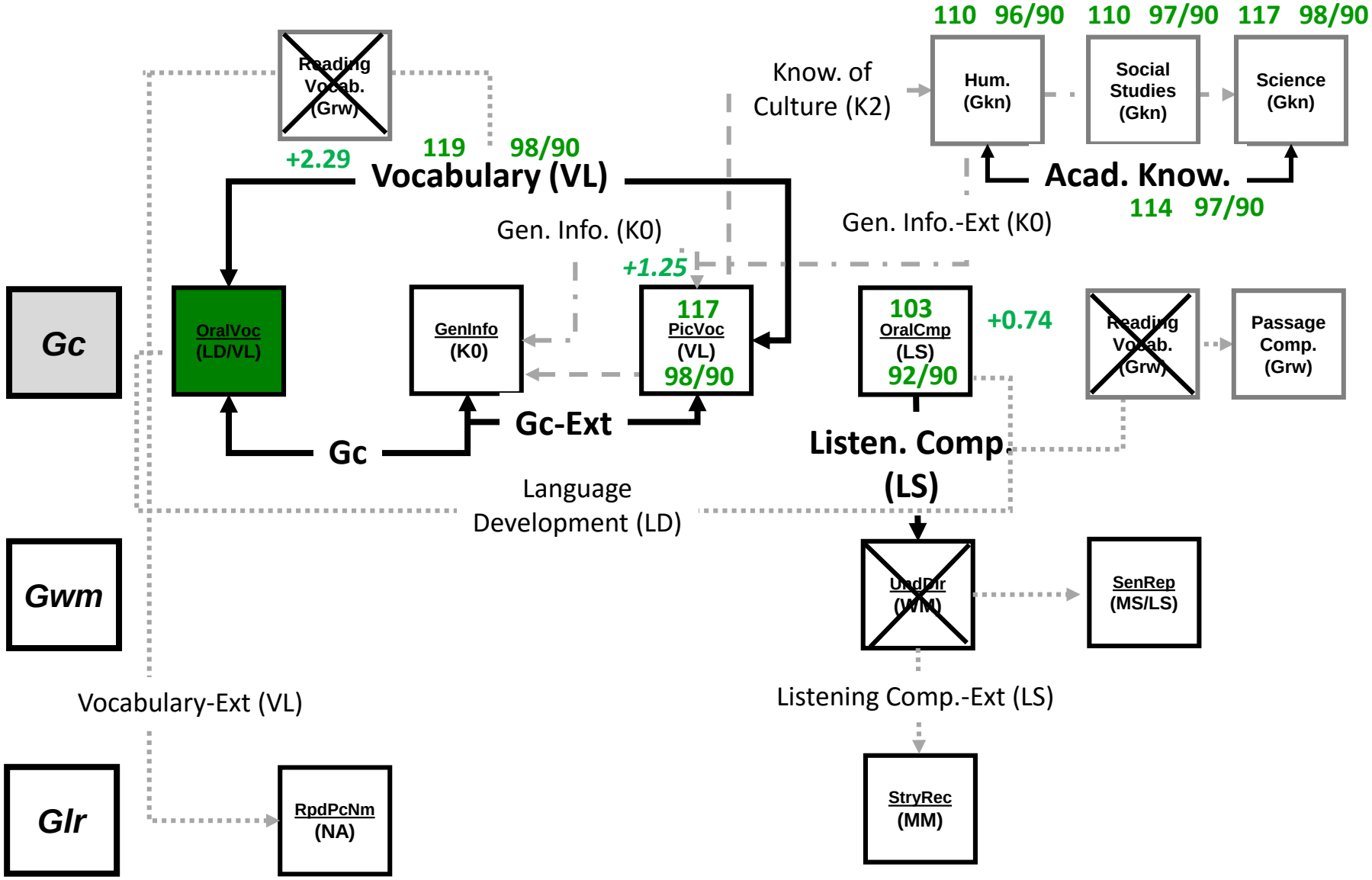
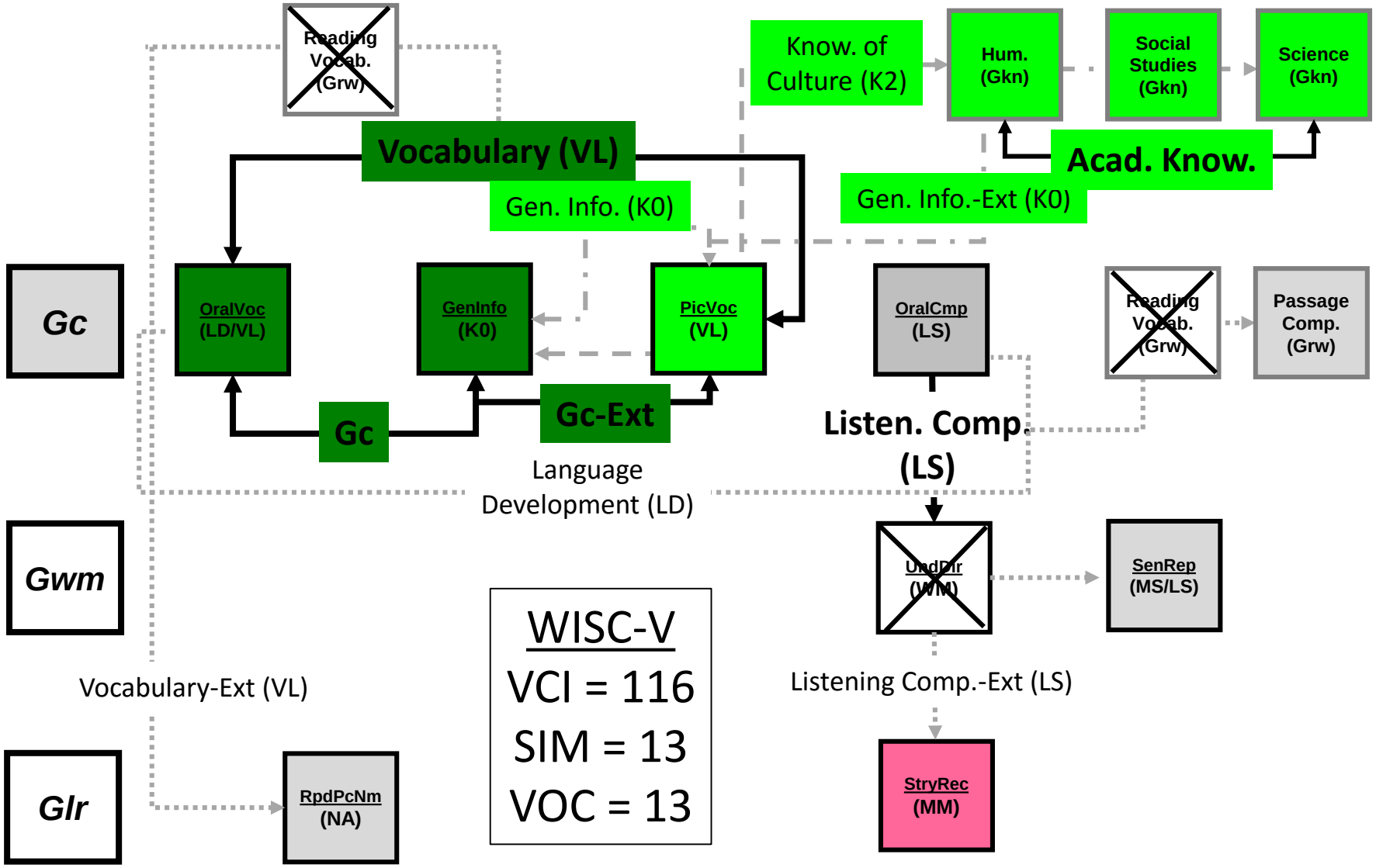
Within CHC domain assessment & interpretation tree - *Gc*



Dr. Kevin McGrew 12-28-15

Within CHC domain assessment & interpretation tree - *Gc*



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WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc *Gf* *Gwm* *Glr* *Gv* *Ga* *Gs*

GIA

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

94
80/90

Vocabulary (VL) → Picture Vocab. → *Gc* *Gc-Ext* → General Info. (dashed) / Oral Comp.

Gf → Concept Formation ⊖

Perceptual Speed (P) → Number-Pattern Matching ⊖ → *Gs* → Pair Canc.

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

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85 (-9 from GIA)
91 (-3 from GIA)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc *Gf* *Gwm* *Glr* *Gv* *Ga* *Gs*

GIA

94
80/90

Oral Vocab. ⊖
Number Series
Verbal Attention
Story Recall
Visual-ization
Phon. Proc. ⊖
Letter-Pattern Matching

Vocabulary (VL)
Picture Vocab..

Gf
Concept Formation ⊖

Perceptual Speed (P)
Number-Pattern Matching ⊖

Gs
Pair Canc.

Ortho. Aware.

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
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GIA/BRS RC Scholastic Aptitude *r* = .87
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Gc/Vocabulary *r* = .89

85 (-9 from GIA)
91 (-3 from GIA)

Within CHC domain assessment & interpretation tree - *Gv*

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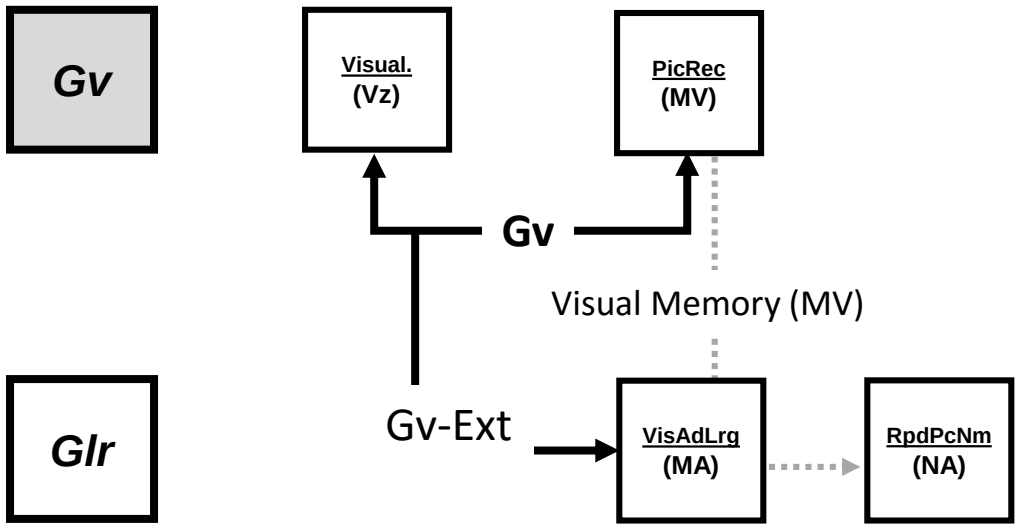
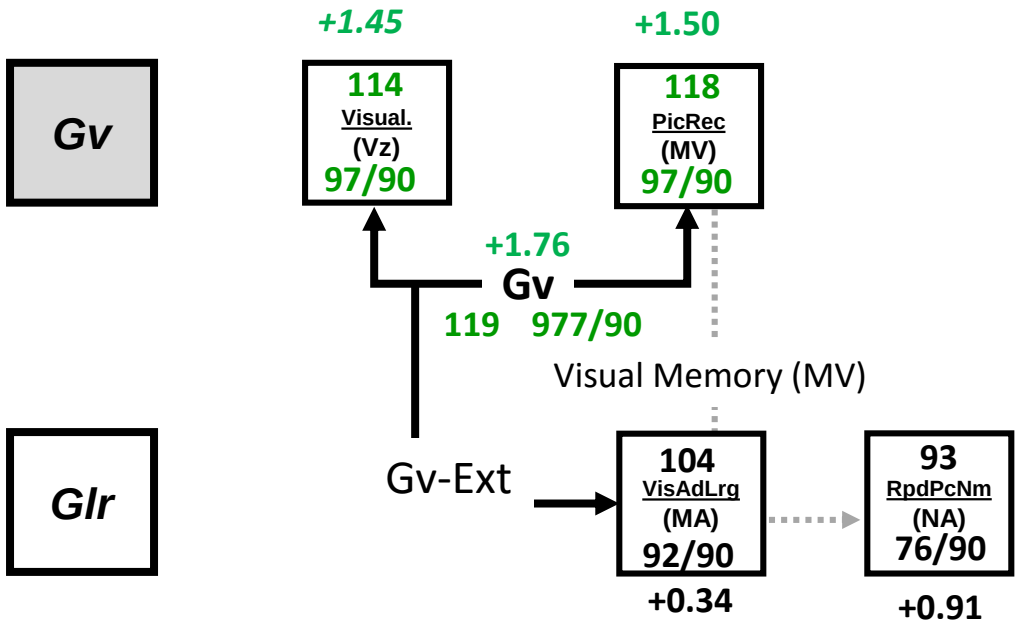


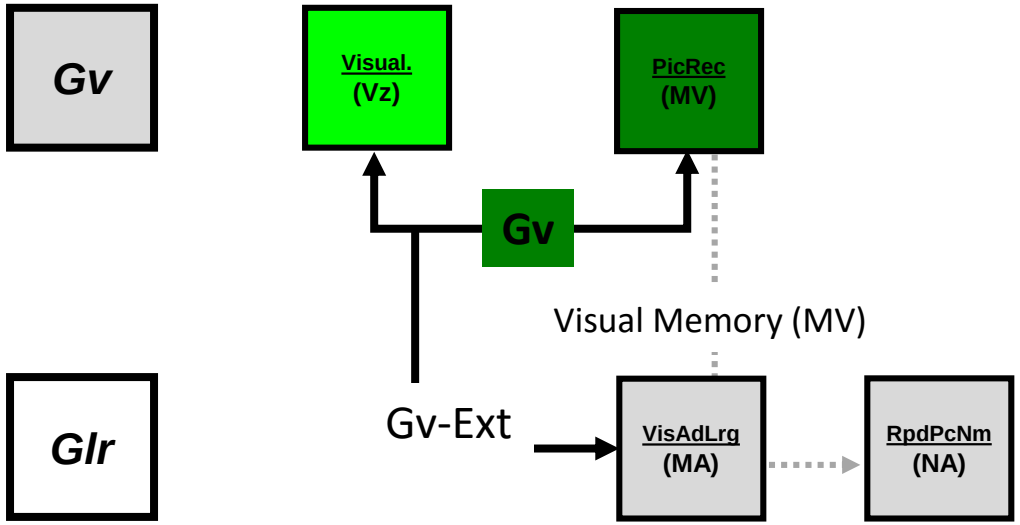
Within CHC domain assessment & interpretation tree - *Gv*

Dr. Kevin McGrew 12-28-15



Within CHC domain assessment & interpretation tree - *Gv*

Dr. Kevin McGrew 12-28-15

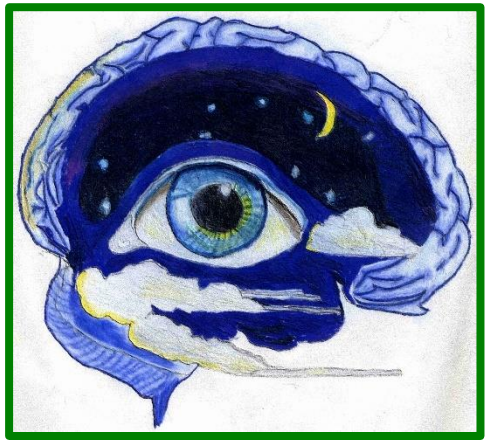


WISC-V

VSI = 111

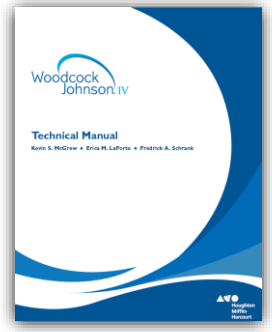
BD = 11

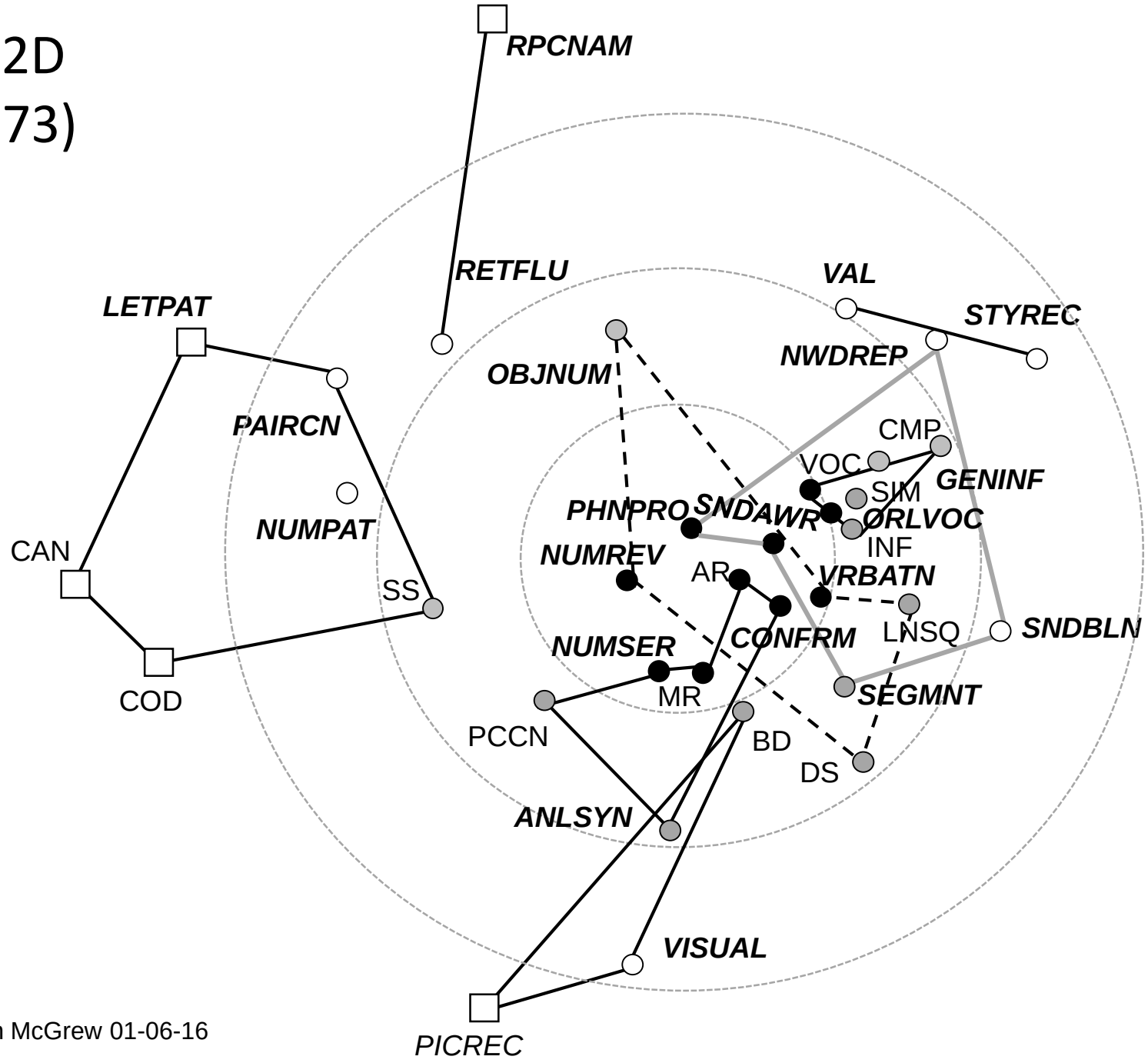
VP = 13



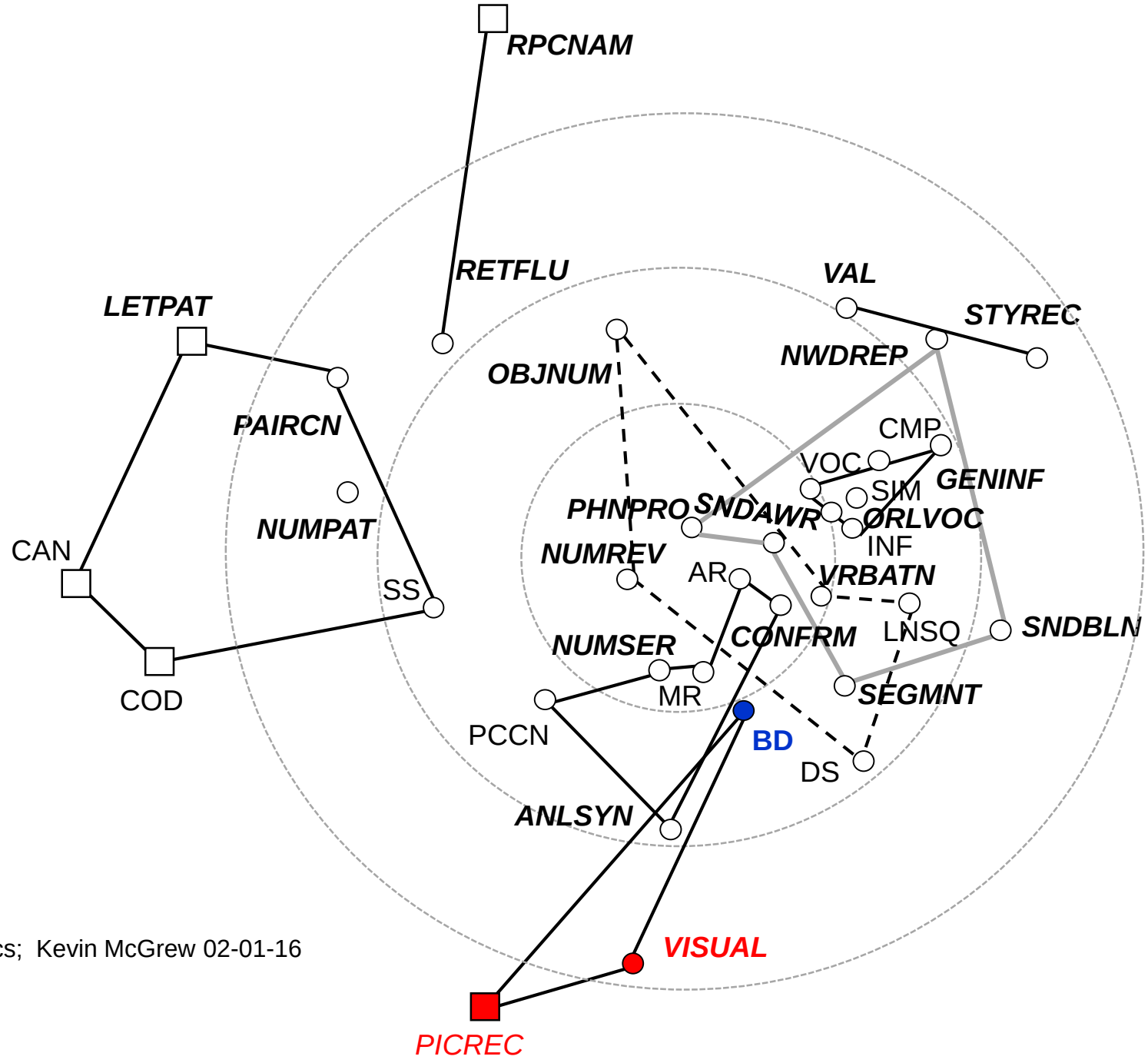
WJ IV and WISC-IV 2D MDS solutions (n=173)

- ● **H** = High
- ⬬ **M** = Moderate
- ○ M = Low Mod.
- □ L = Low





WJ IV and WISC-IV 2D MDS solutions (n=173)



Visual Puzzles?

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc | Gf | Gwm | Glr | Gv | Ga | Gs

GIA

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

94
80/90

High

Vocabulary (VL)

Picture Vocab.

Gf

Concept Formation ⊖

Perceptual Speed (P)

Number-Pattern Matching ⊖

Gs

Pair Canc.

Ortho. Aware.

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
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85 (-9 from GIA)
91 (-3 from GIA)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

Ga

Nonword Repetition

Segmen-tation

Phonetic Coding (PC)

Sound Blending

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

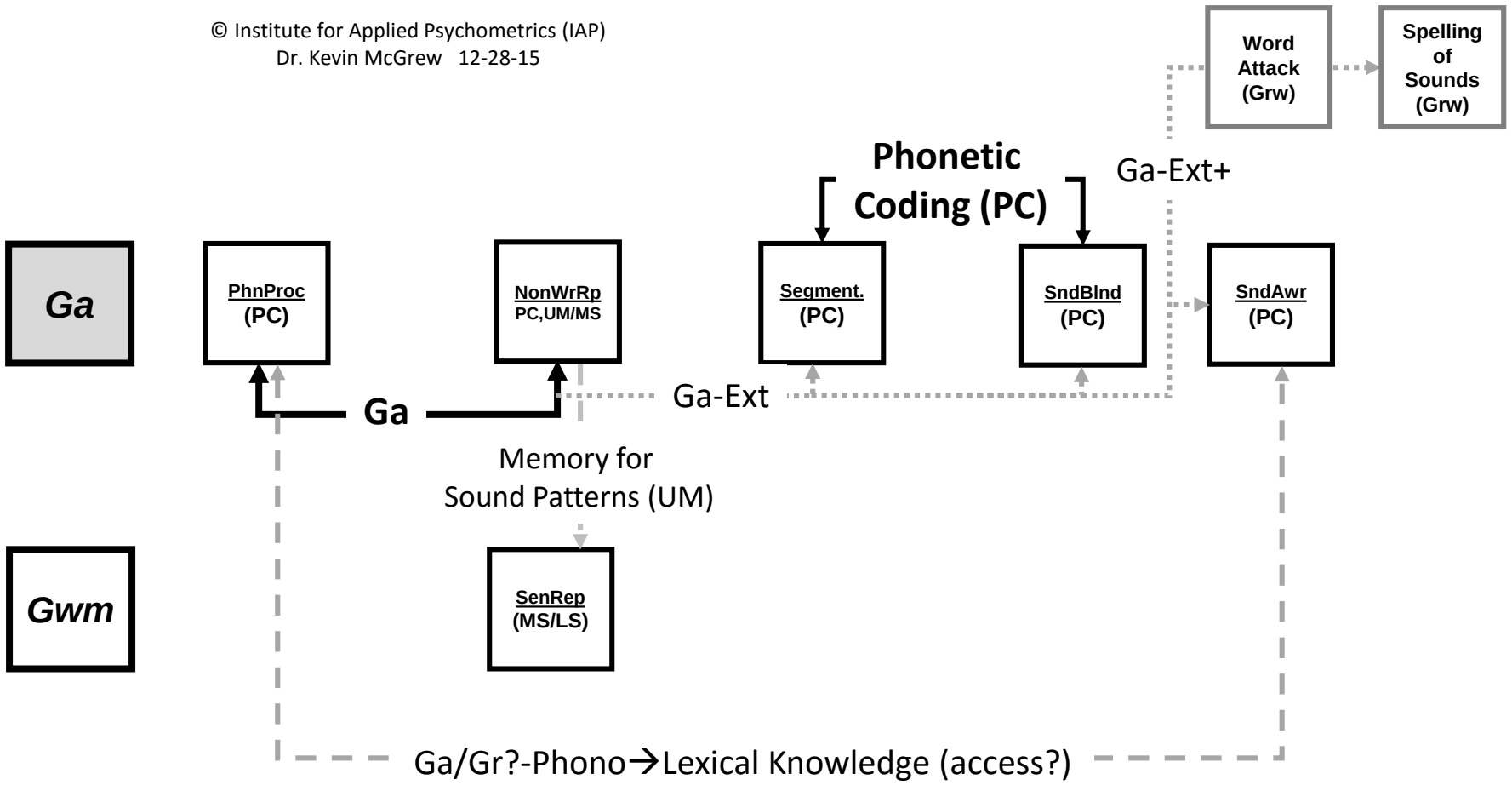
Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

Within CHC domain assessment & interpretation tree - *Ga*



Within CHC domain assessment & interpretation tree - *Ga*

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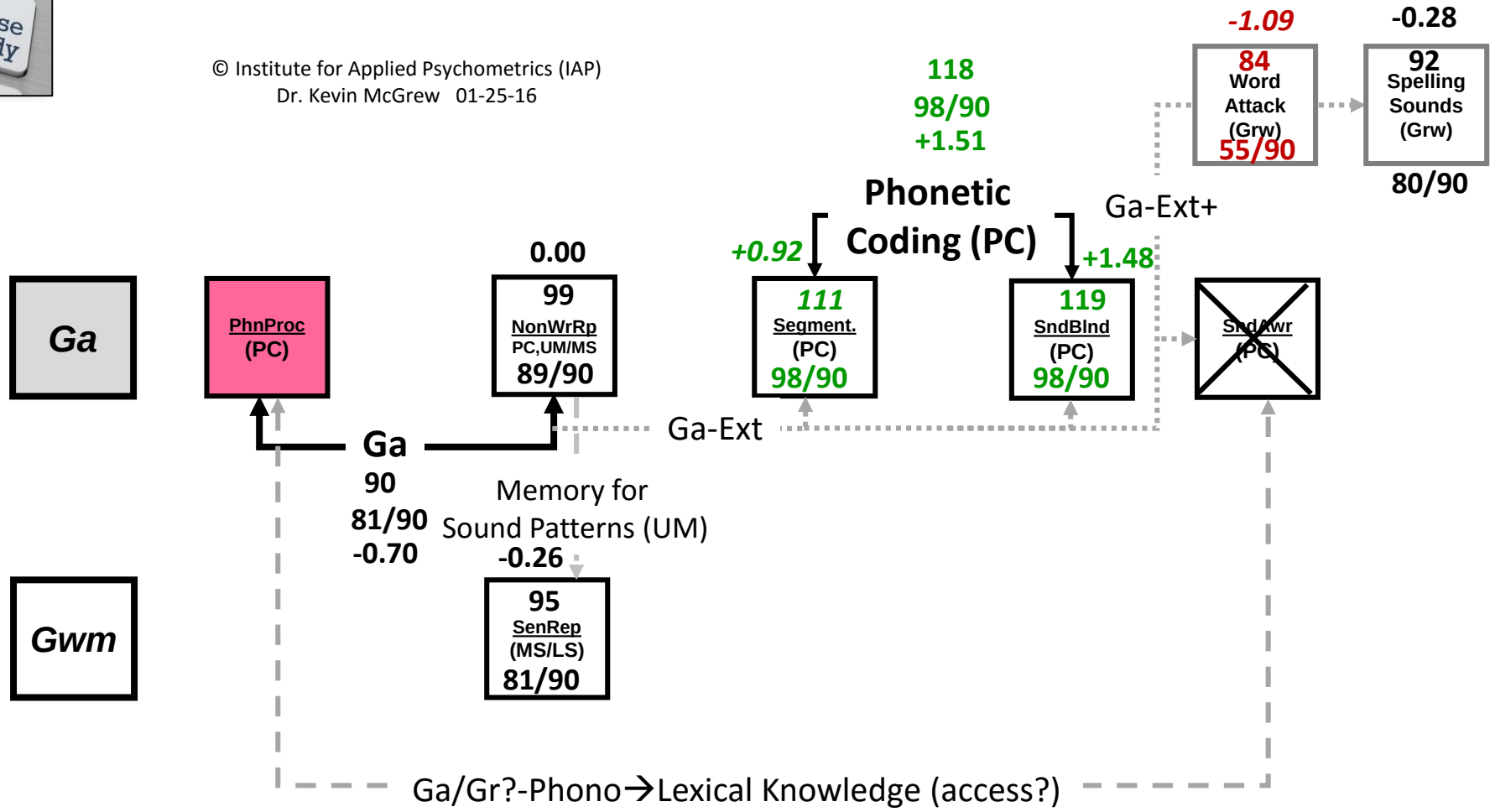
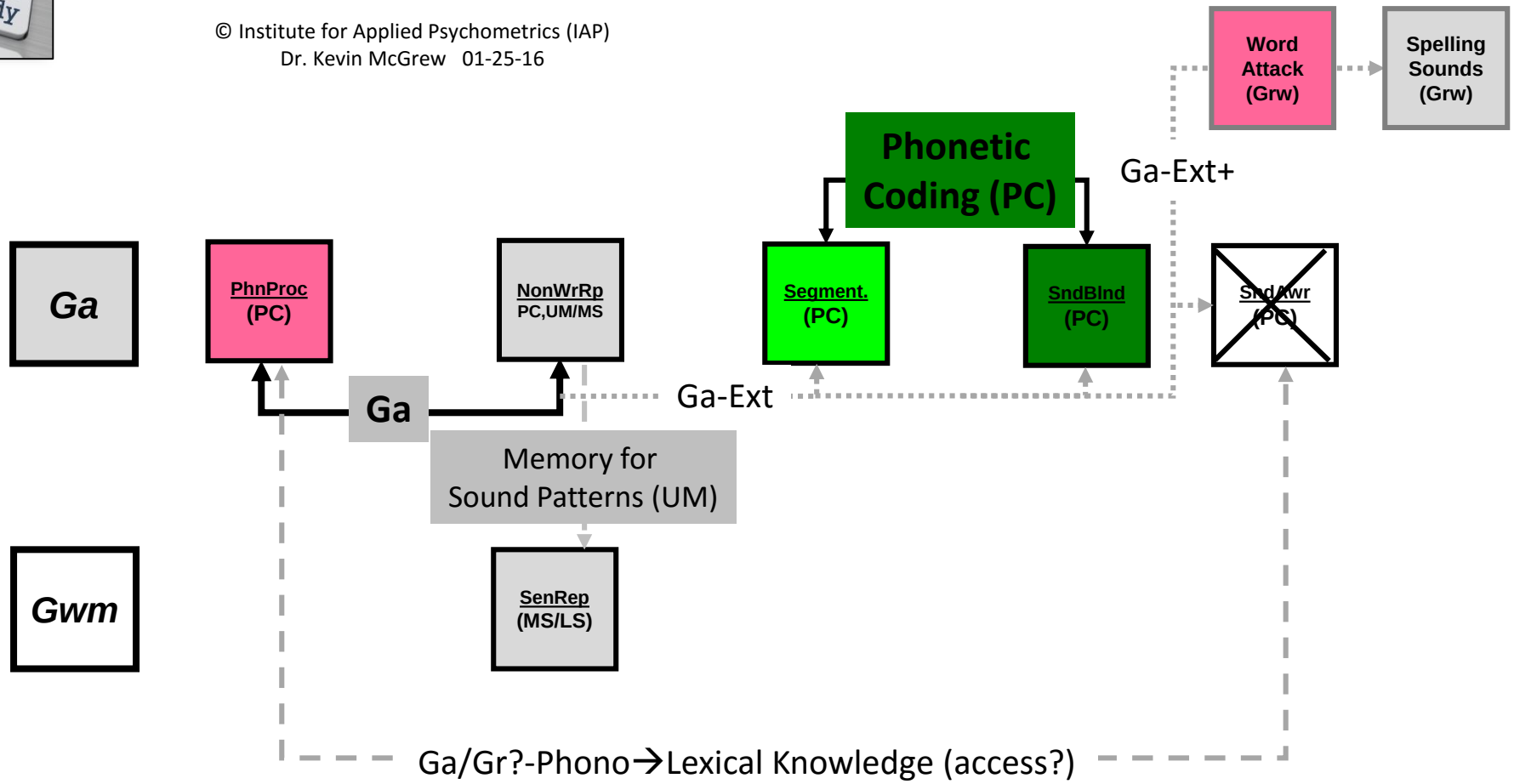
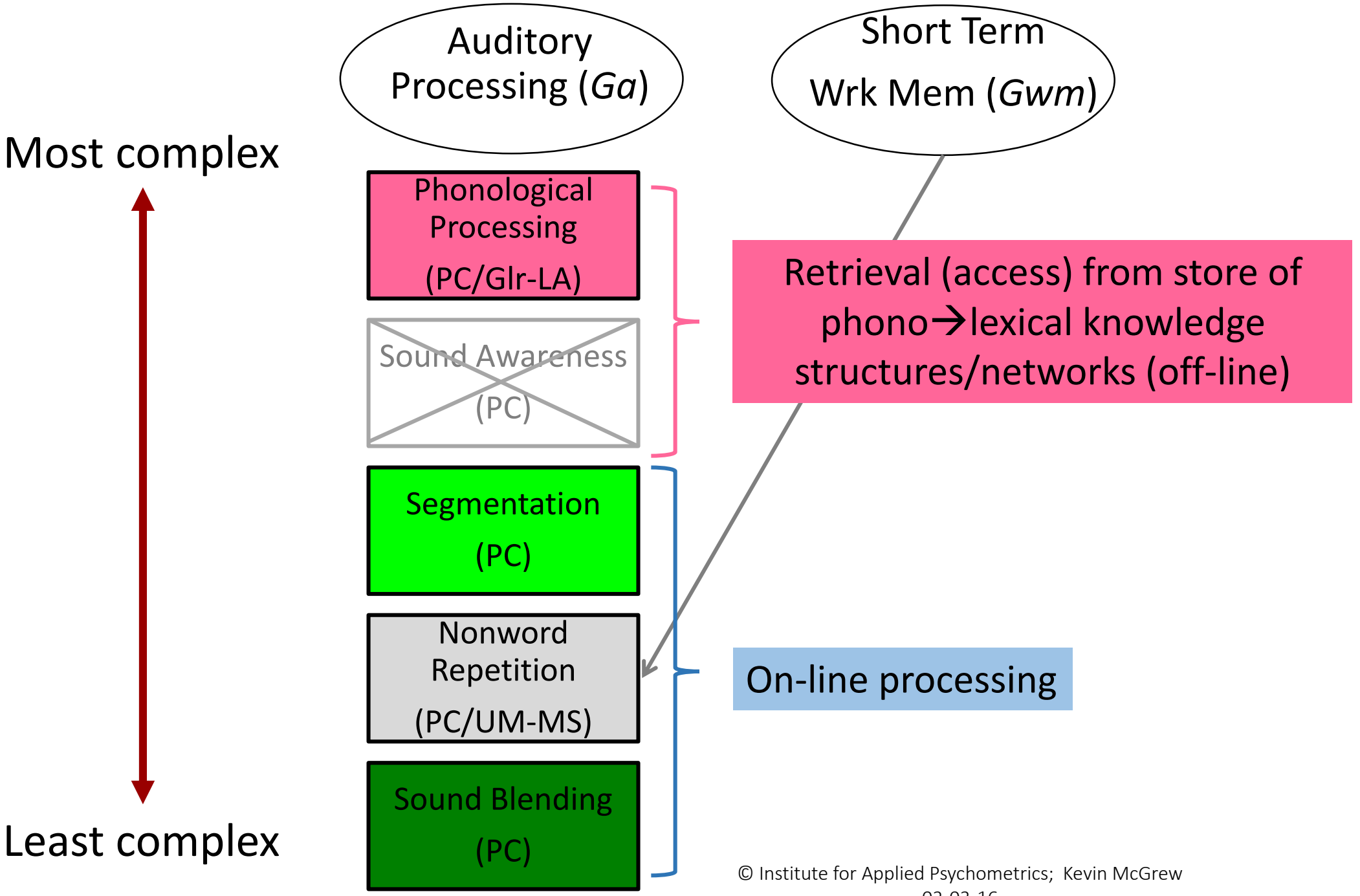


Within CHC domain assessment & interpretation tree - *Ga*

Dr. Kevin McGrew 01-25-16





Trends in Cognitive Sciences October 2014, Vol. 18, No. 10

Dyslexia: reconciling controversies within an integrative developmental perspective

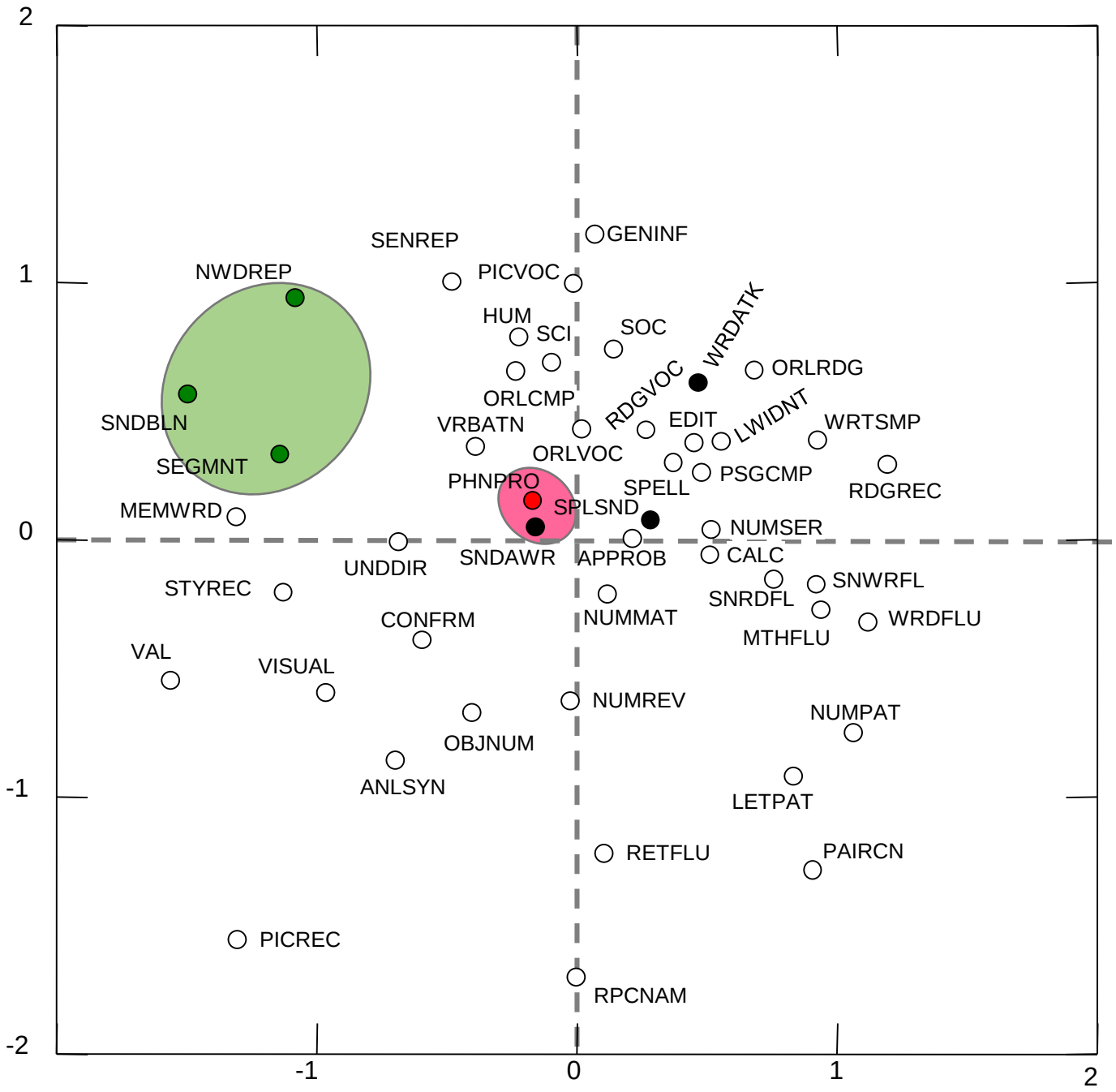
Bart Boets[1,2]

[1] Child and Adolescent Psychiatry, KU Leuven, Leuven, Belgium
[2] Department of Brain and Cognitive Sciences and McGovern Institute for Brain Research, Massachusetts Institute of Technology (MIT), Cambridge, MA USA

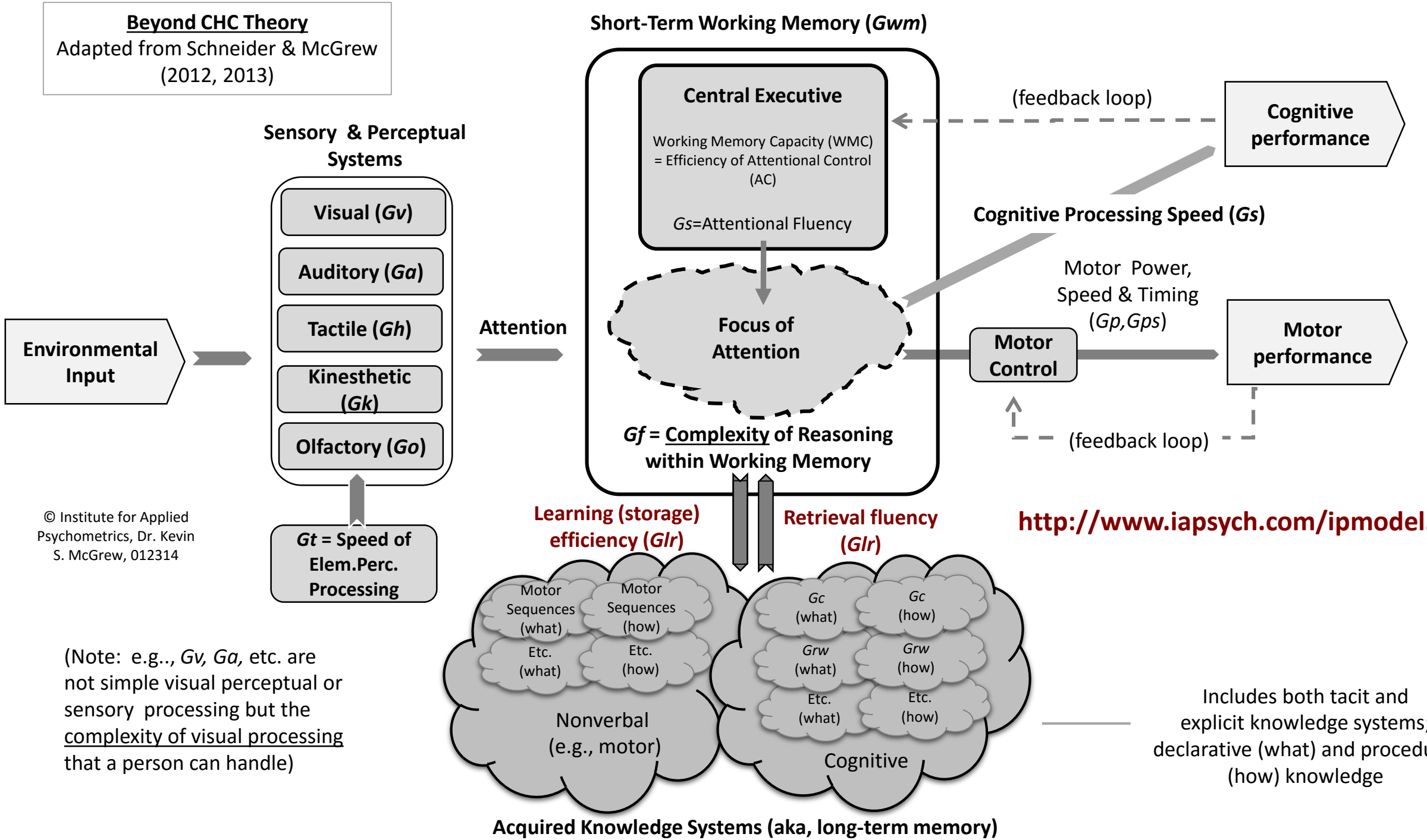
However, the leading phonological deficit hypothesis on dyslexia has recently been challenged by studies asserting that the phonological representations *per se* may be intact in individuals with dyslexia, but the ability to access them is impaired. Ramus and colleagues reached this conclusion based on a series of in-depth cognitive studies in adults

from the growing evidence for a dysfunctional fronto-temporal connection in dyslexia, which has been interpreted as neural evidence for impaired access to phonological representations [4]. There is reason to believe that this particu-

Exploratory MDS of WJ IV norm subjects ages 6-19



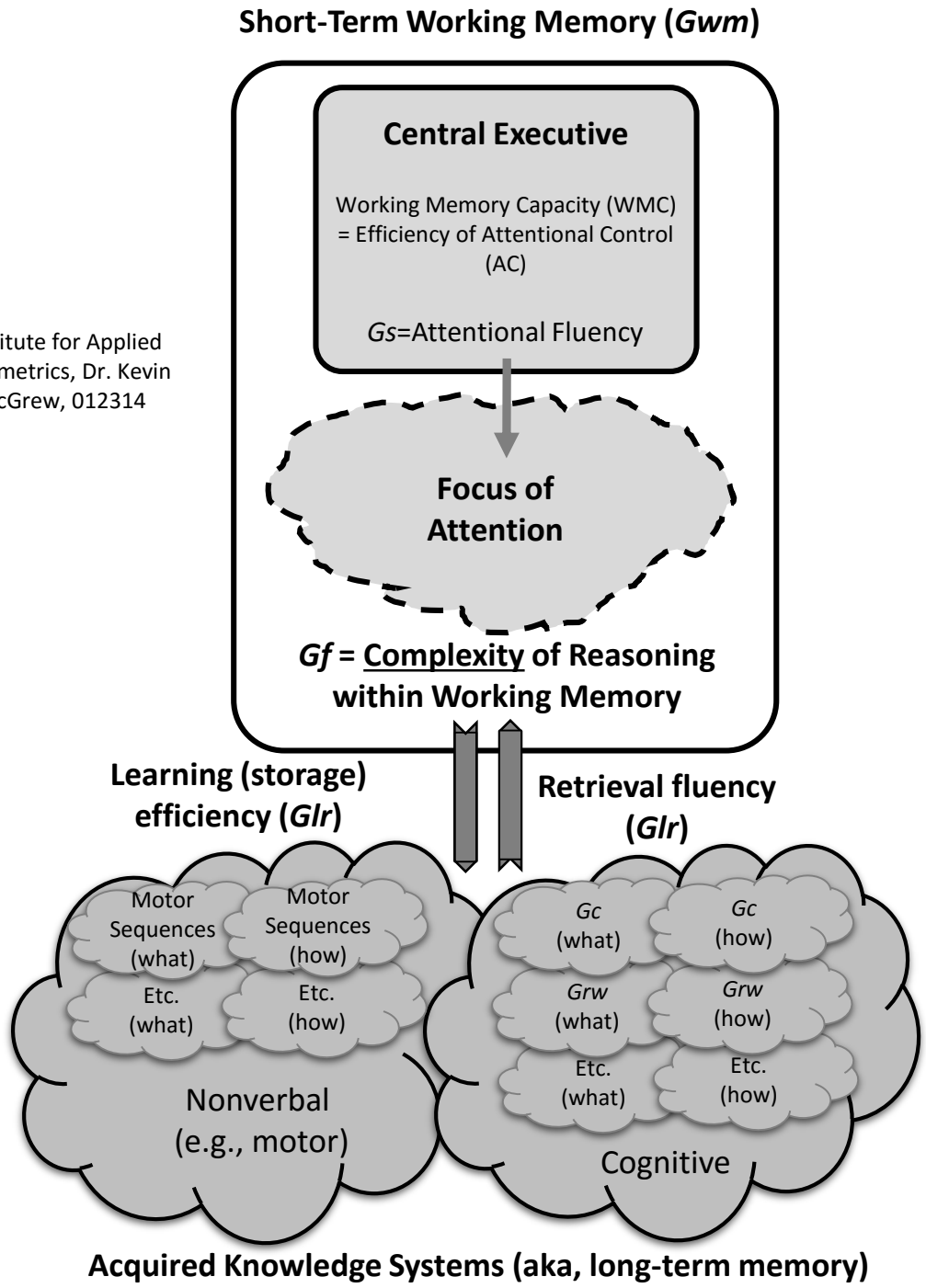
Beyond CHC Theory
Adapted from Schneider & McGrew (2012, 2013)

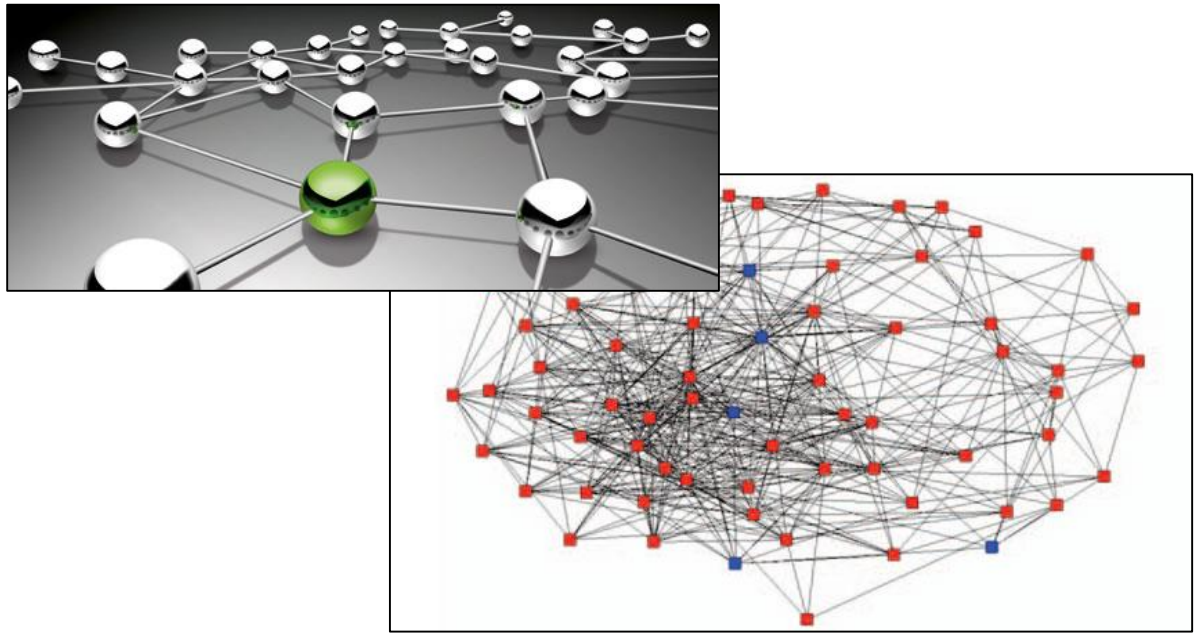


http://www.iapsych.com/ipmodel.pdf

(Note: e.g.., *Gv, Ga,* etc. are not simple visual perceptual or sensory processing but the complexity of visual processing that a person can handle)

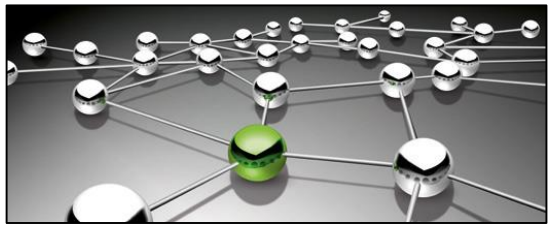
Includes both tacit and explicit knowledge systems; declarative (what) and procedural (how) knowledge



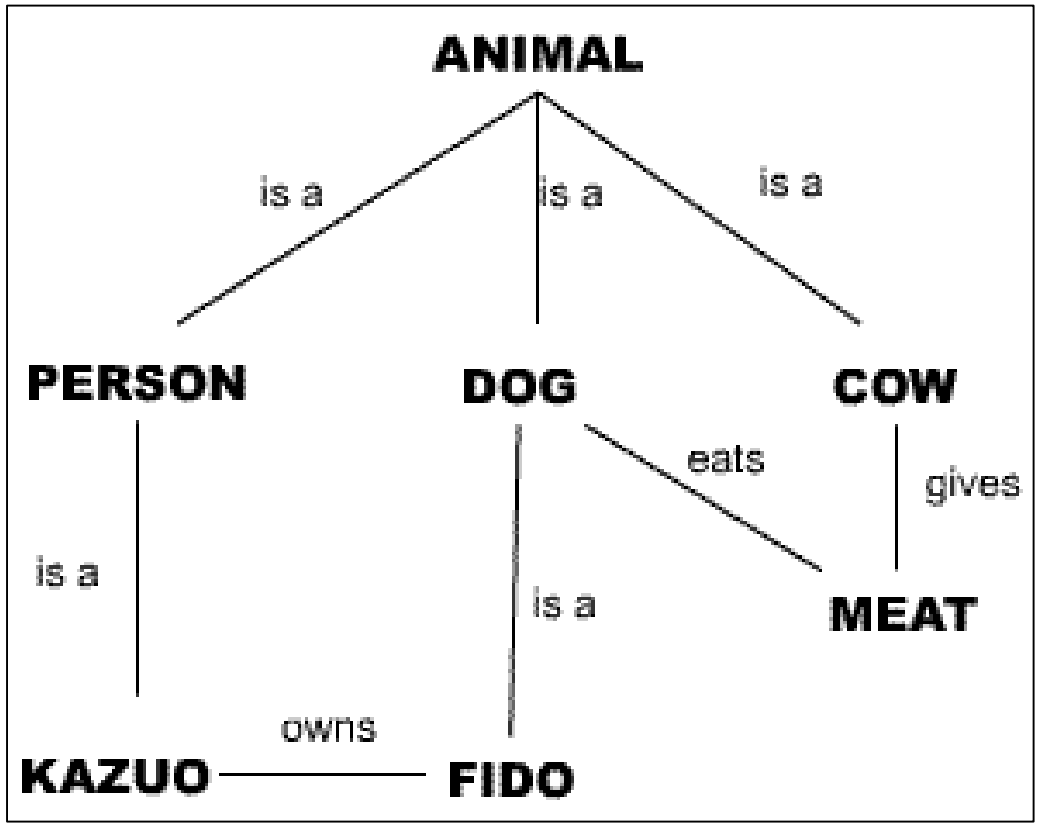


Acquired knowledge systems are organized as node-link networks

Retrieval fluency (*Glr*) is efficiency of searching and retrieving from a specific knowledge network

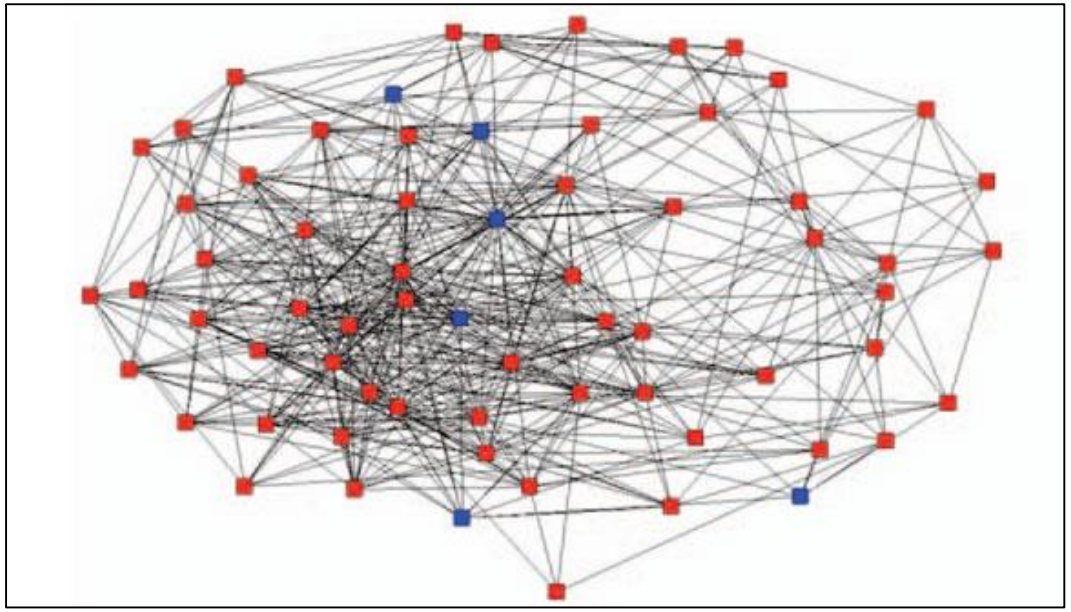


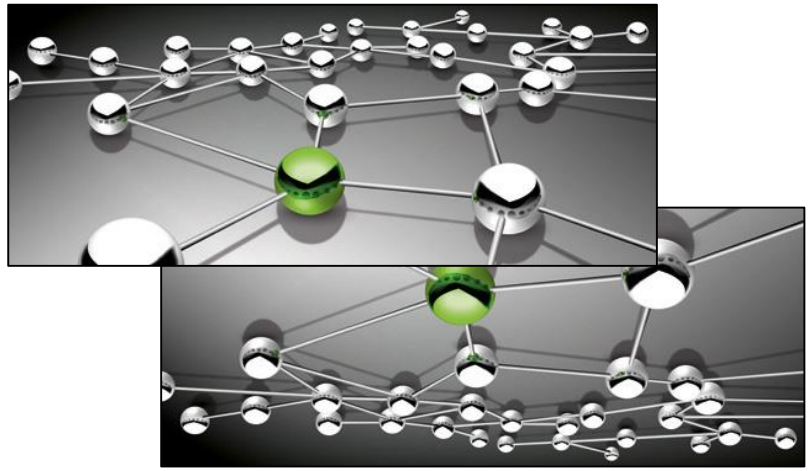
Semantic networks

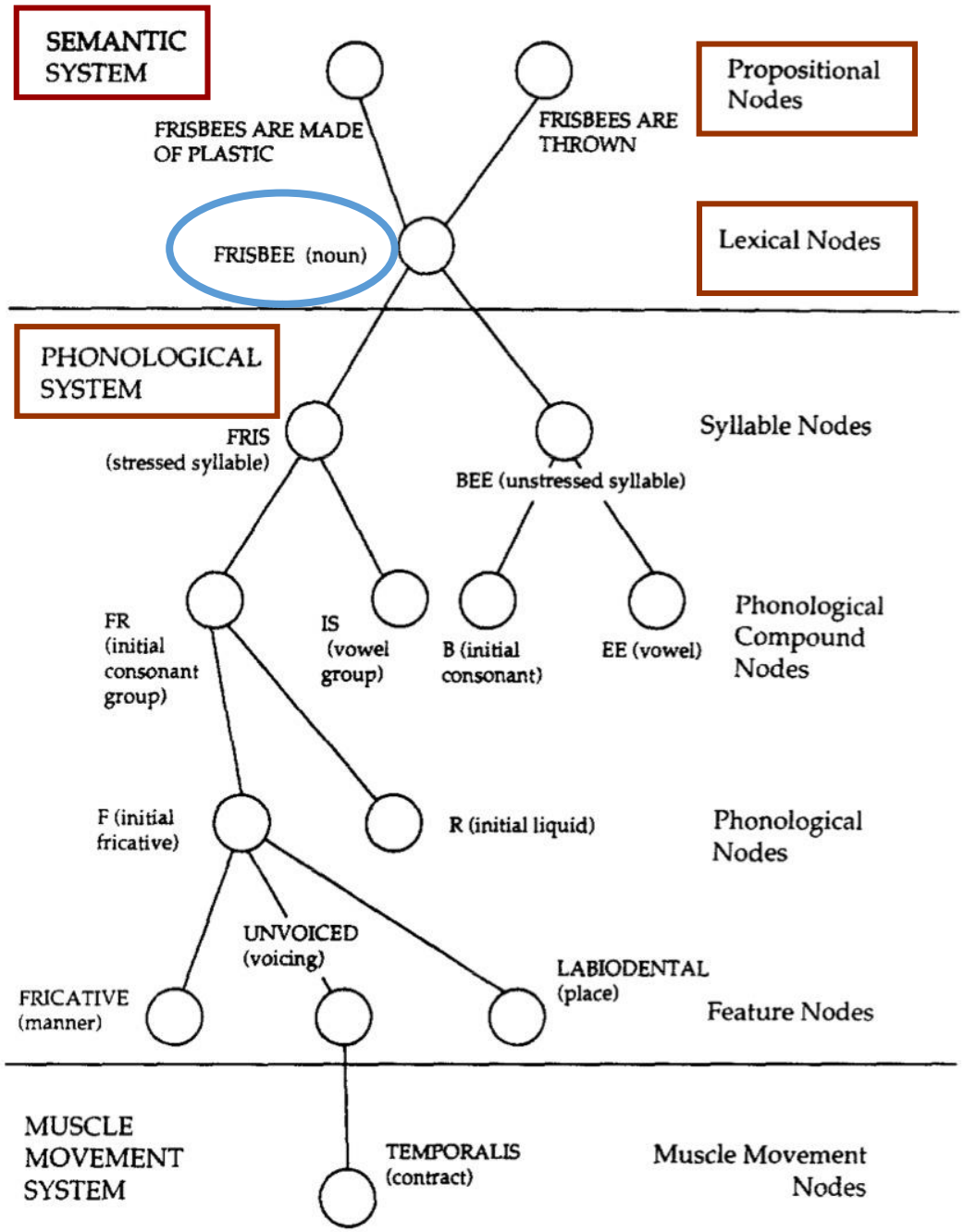


-Lexical nodes

-Propositional nodes






SEMANTIC SYSTEM
FRISBEES ARE MADE OF PLASTIC
FRISBEES ARE THROWN
Propositional Nodes
FRISBEE (noun)
Lexical Nodes
PHONOLOGICAL SYSTEM
FRIS (stressed syllable)
BEE (unstressed syllable)
Syllable Nodes
FR (initial consonant group)
IS (vowel group)
B (initial consonant)
EE (vowel)
Phonological Compound Nodes
F (initial fricative)
R (initial liquid)
Phonological Nodes
UNVOICED (voicing)
FRICATIVE (manner)
LABIODENTAL (place)
Feature Nodes
MUSCLE MOVEMENT SYSTEM
TEMPORALIS (contract)
Muscle Movement Nodes

Example of network science research: How the structure of a phonological network influences processing in the psycholinguistic system

Journal of Memory and Language 73 (2014) 131–147

Contents lists available at ScienceDirect

Journal of Memory and Language

journal homepage: www.elsevier.com/locate/jml

Keywords in the mental lexicon

Michael S. Vitevitch *, Rutherford Goldstein [1]

Department of Psychology, University of Kansas, United States

Information processing
(mechanical models)

Sample phonological network: "Speech" and phonological neighbors

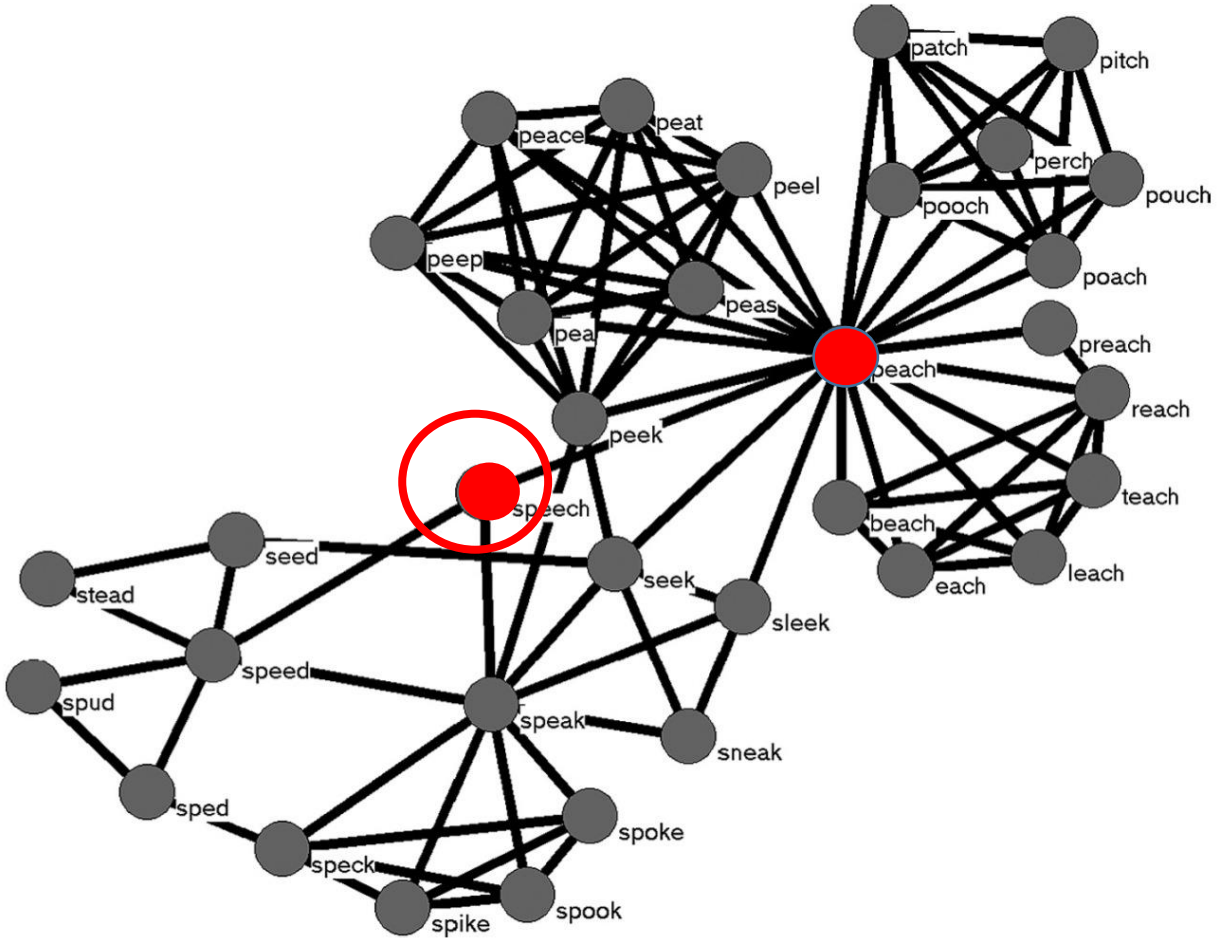
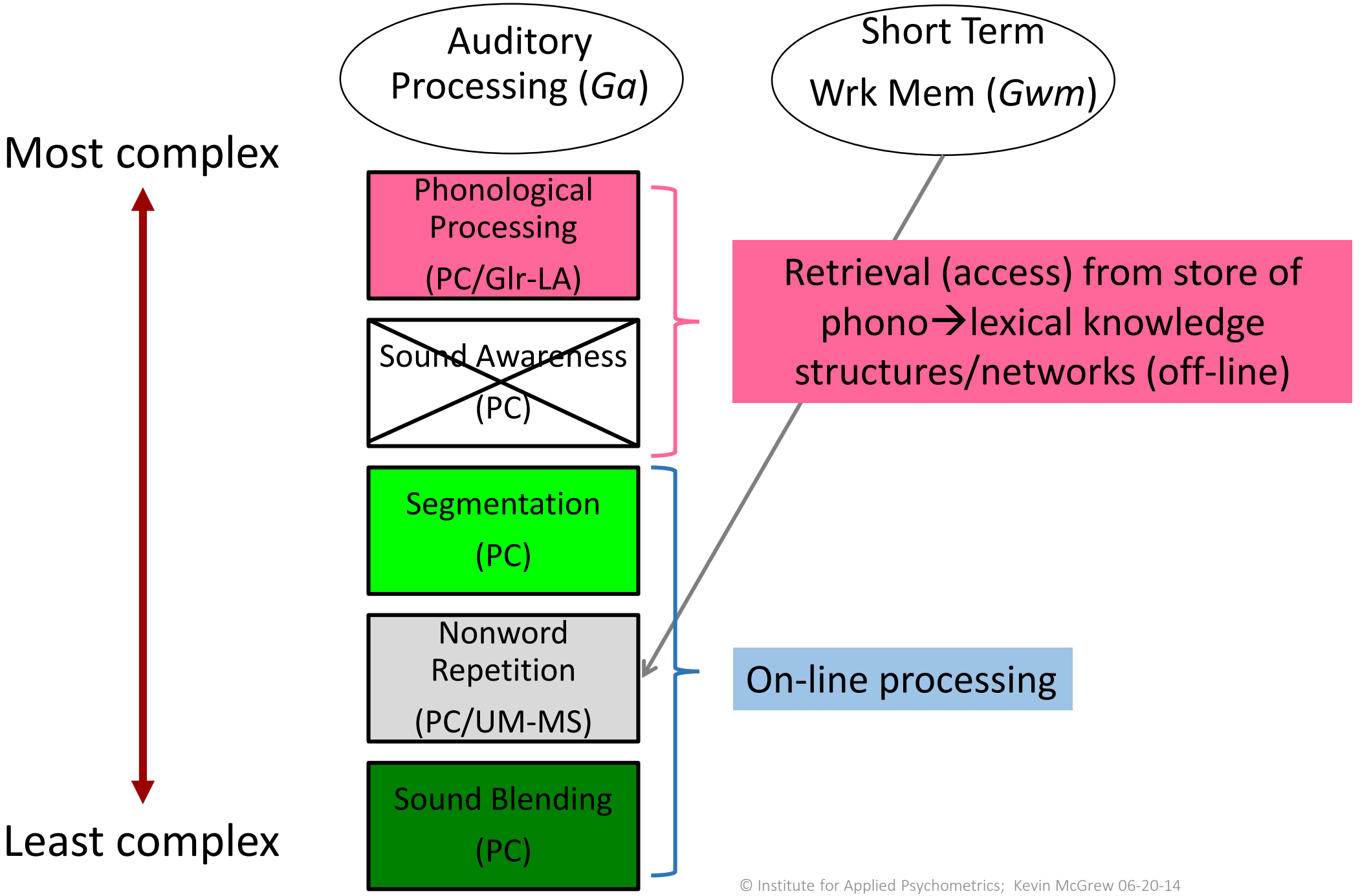


Fig. 1. A sample of words from the phonological network analyzed in Vitevitch (2008). The word "speech" and its phonological neighbors (i.e., words that differ by the addition, deletion or substitution of a phoneme) are shown. The phonological neighbors of those neighbors (i.e., the 2-hop neighborhood of "speech") are also shown.



Beyond CHC Theory
Adapted from Schneider & McGrew (2012, 2013)

Short-Term Working Memory (*Gwm*)

Central Executive

Working Memory Capacity (WMC) = Efficiency of Attentional Control (AC)

Gs=Attentional Fluency

(feedback loop)

Cognitive performance

Cognitive Processing Speed (*Gs*)

Sensory & Perceptual Systems

Visual (*Gv*)

Auditory (*Ga*)

Tactile (*Gh*)

Kinesthetic (*Gk*)

Olfactory (*Go*)

Environmental Input

Attention

Focus of Attention

Motor Power, Speed & Timing (*Gp*,*Gps*)

Motor Control

Motor performance

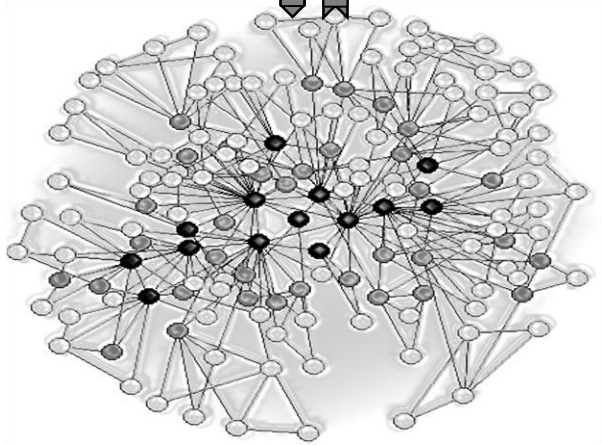
(feedback loop)

***Gf* = Complexity of Reasoning within Working Memory**

Learning (storage) efficiency (*Glr*)

Retrieval fluency (*Glr*)

***Gt* = Speed of Elem.Perc. Processing**



Semantic and phonological knowledge network

(Note: e.g.., *Gv, Ga,* etc. are not simple visual perceptual or sensory processing but the complexity of visual processing that a person can handle)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

94
80/90

Oral Vocab. ⊖ | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. ⊖ | Letter-Pattern Matching

Vocabulary (VL) → Picture Vocab.

Gf → Concept Formation ⊖

Ga → Nonword Repetition → Segmen-tation ⋯ **Phonetic Coding (PC)** → Sound Blending

Phono→lex. Knowledge?

Perceptual Speed (P) → Number-Pattern Matching ⊖ → ***Gs*** → Pair Canc.

Ortho. Aware.

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

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Gc/Vocabulary *r* = .89

85 (-9 from GIA)
91 (-3 from GIA)

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

Gwm

Numbers Reversed

~~Under. Directions~~

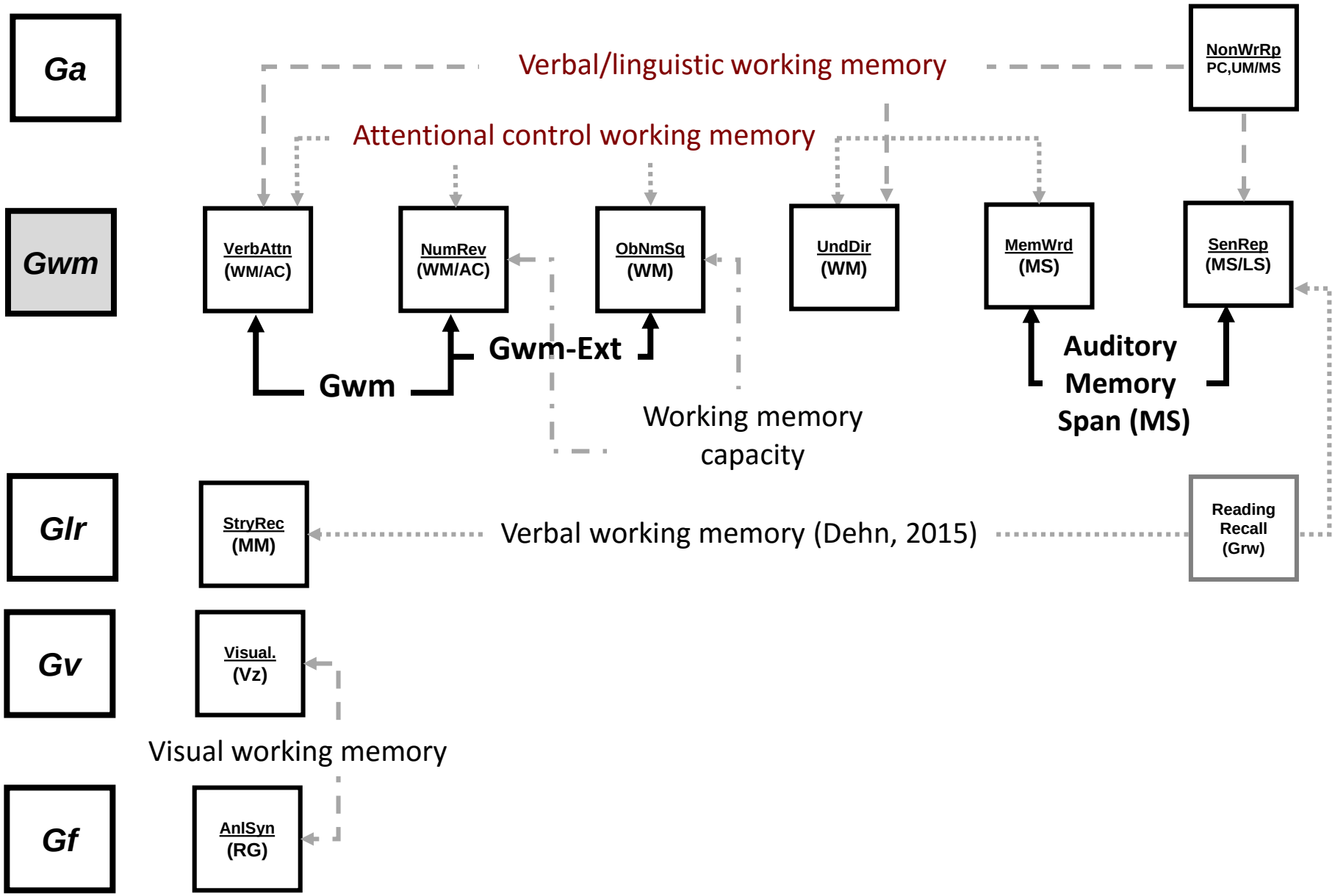
Sentence Repetition

High

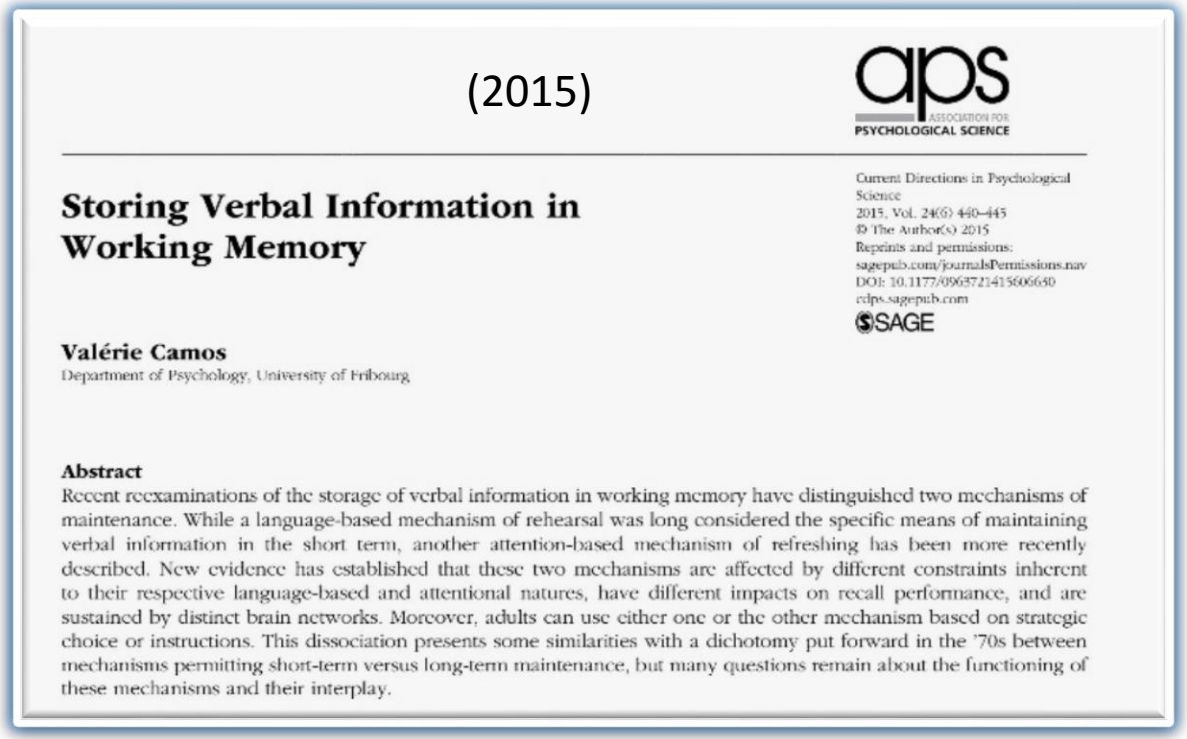
Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

Within CHC domain assessment & interpretation tree - *Gwm*



Two primary mechanisms of verbal working memory maintenance



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Storing Verbal Information in Working Memory

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Abstract
Recent reexaminations of the storage of verbal information in working memory have distinguished two mechanisms of maintenance. While a language-based mechanism of rehearsal was long considered the specific means of maintaining verbal information in the short term, another attention-based mechanism of refreshing has been more recently described. New evidence has established that these two mechanisms are affected by different constraints inherent to their respective language-based and attentional natures, have different impacts on recall performance, and are sustained by distinct brain networks. Moreover, adults can use either one or the other mechanism based on strategic choice or instructions. This dissociation presents some similarities with a dichotomy put forward in the '70s between mechanisms permitting short-term versus long-term maintenance, but many questions remain about the functioning of these mechanisms and their interplay.

Tasks that make greater use of the articulatory rehearsal maintenance mechanism

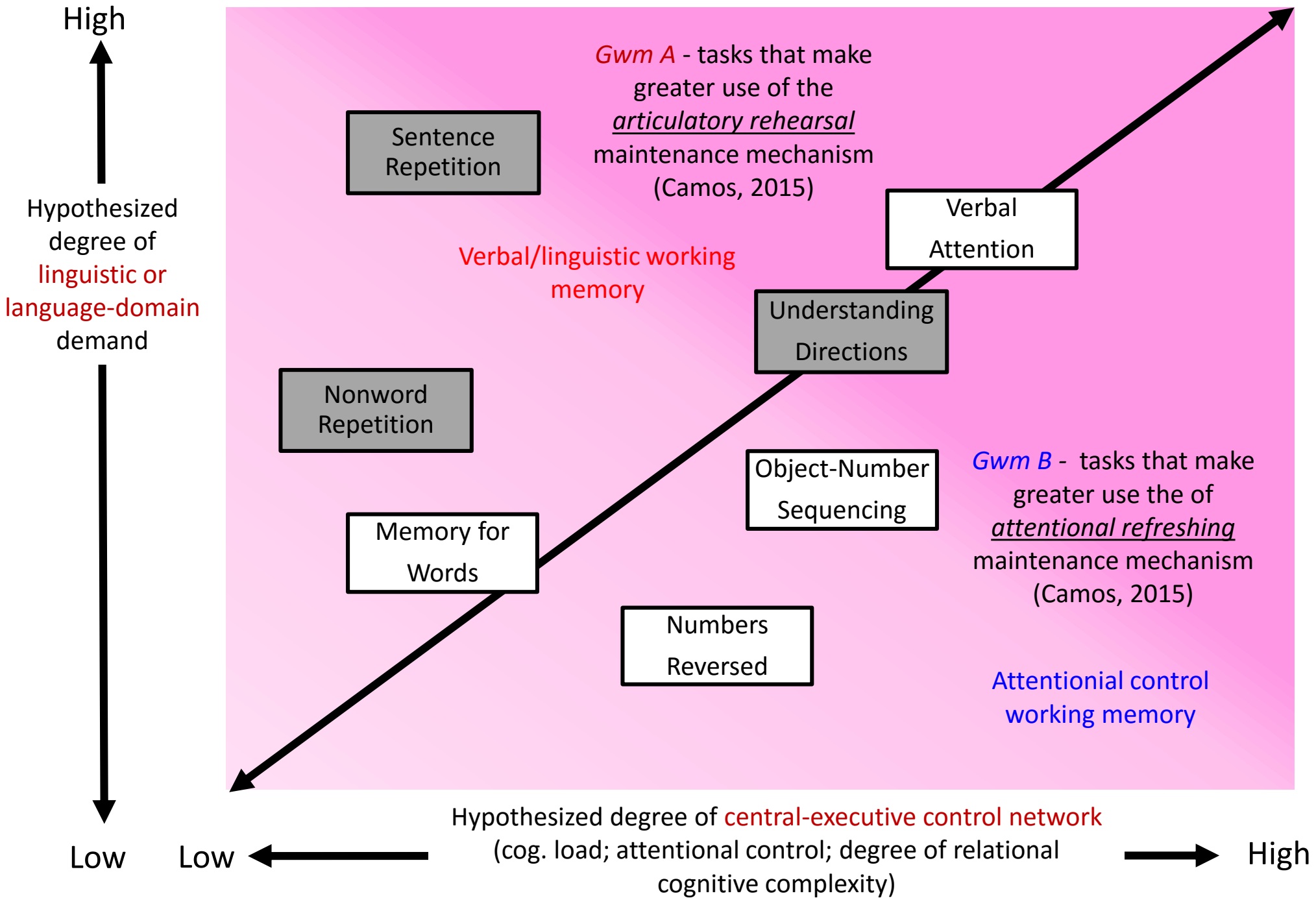
- A language production process mechanism
- Phonological effects research
- Covert/overt rehearsal

Tasks that make greater use the of attentional refreshing maintenance mechanism

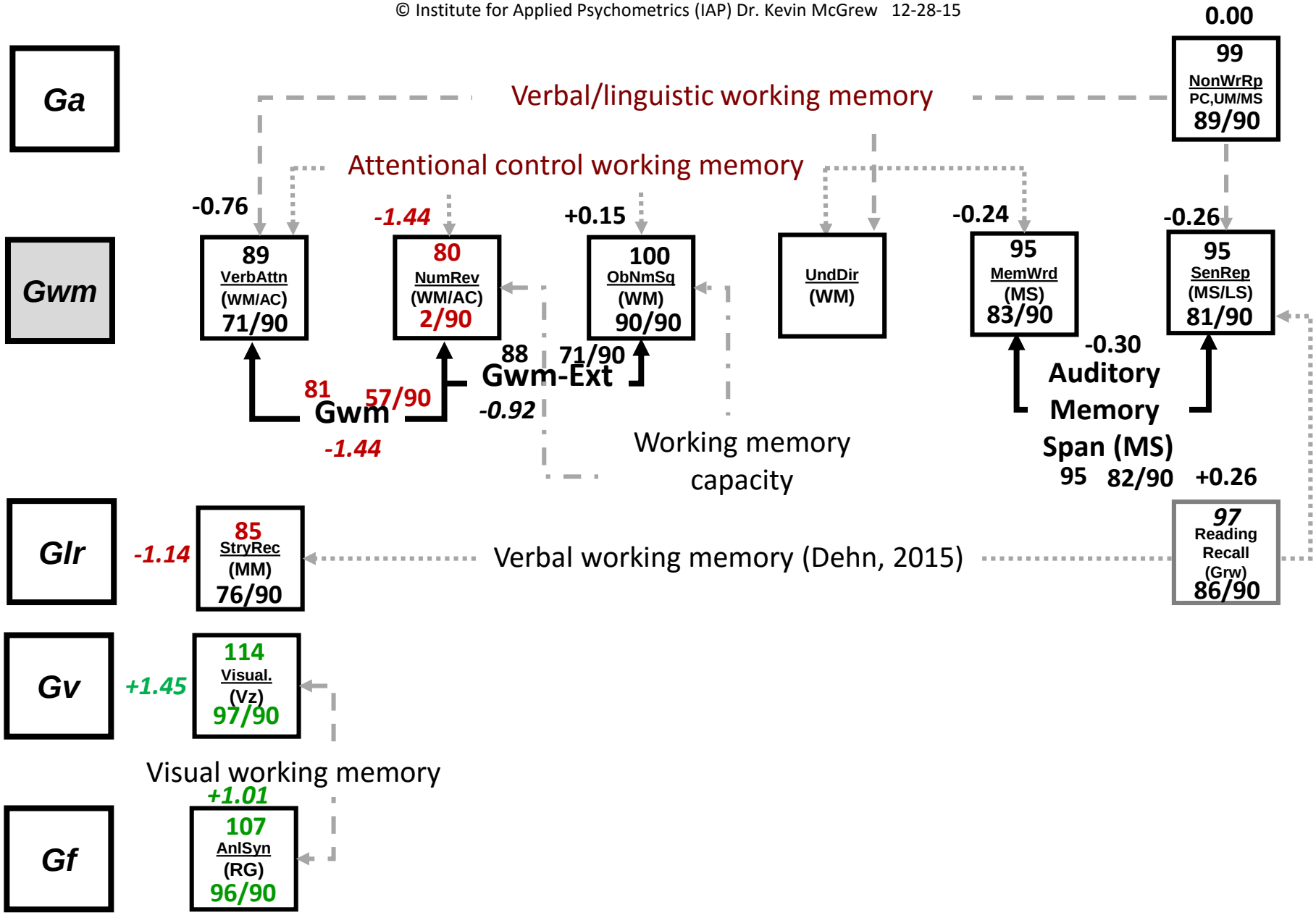
- Reactivation memory trace mechanism across stimulus domains (lang, visual, spatial)
- Increasing focus and inhibiting distractions
- Controlling and directing focus of attention

Distances between tests intended to reflect relative hypothesized differences (not quantified) along two axis

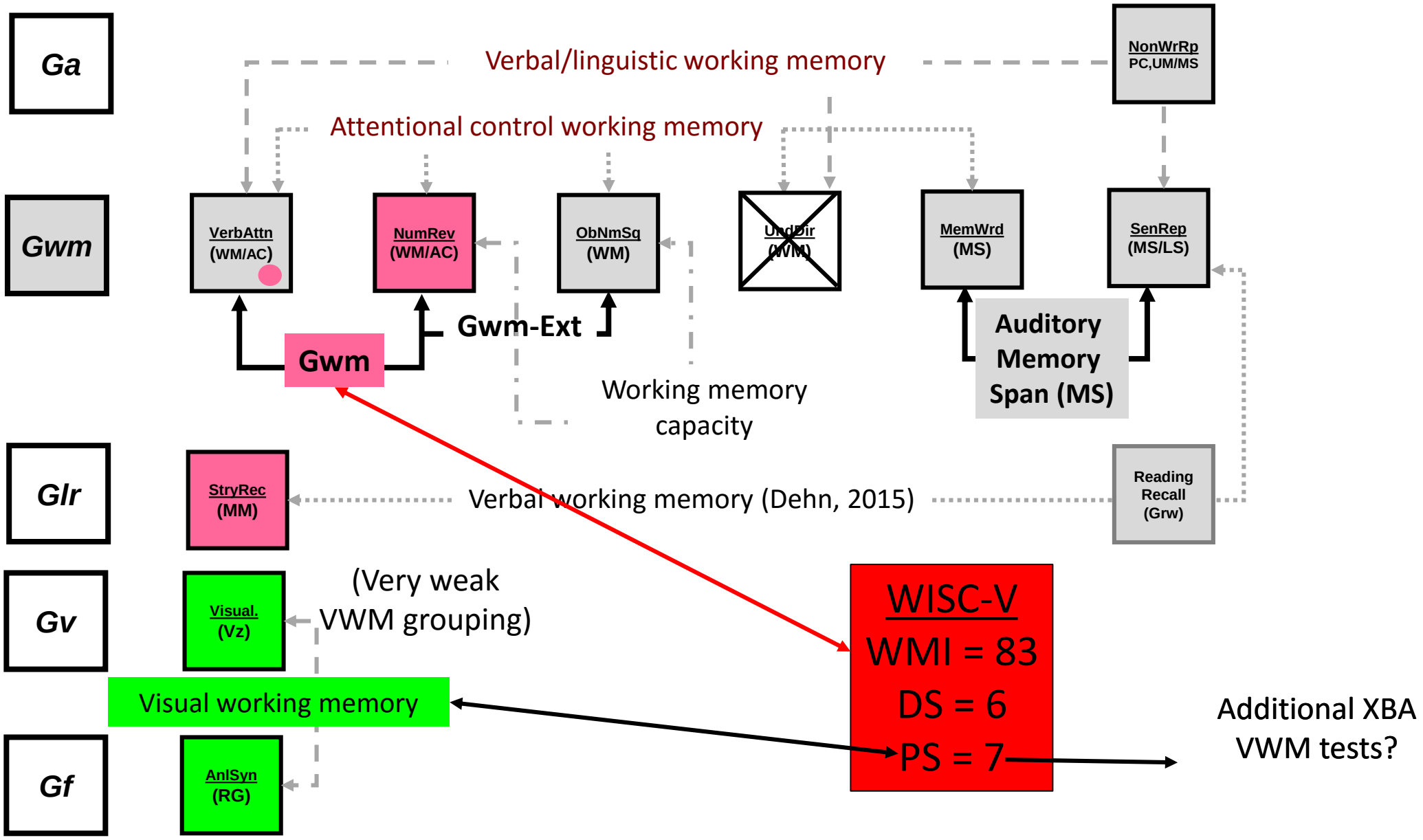
Linguistic/language dimension classifications based on inspection of correlations with other WJ IV tests of *Gc* and *Ga* and Flanagan & Ortiz (2015) linguistic demand classifications



Within CHC domain assessment & interpretation tree - *Gwm*



Within CHC domain assessment & interpretation tree - *Gwm*



WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

94
80/90

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

Vocabulary (VL) → Picture Vocab.

Gf → Concept Formation

Gwm → Numbers Reversed → ~~Under. Directions~~ | Sentence Repetition

Ga → Nonword Repetition → Segmen-tation → **Phonetic Coding (PC)** → Sound Blending

Perceptual Speed (P) → Number-Pattern Matching → ***Gs*** → Pair Canc.

Ortho. Aware.

XBA VWM testing?

Phono→lex. Knowledge?

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

~~Retrieval Fluency~~

Speed of Lexical Access (LA)

Rapid Pic. Nam.

Glr

Vis. Aud. Lrn.

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

See within CHC domain assessment/interp. tree for in depth assessment in each domain

● BRS Scholastic Aptitude Cluster
⊖ RC Scholastic Aptitude Cluster

GIA/BRS RC Scholastic Aptitude *r* = .87
Gs/Perceptual Speed *r* = .85
Gc/Vocabulary *r* = .89

Within CHC domain assessment & interpretation tree - *Glr*

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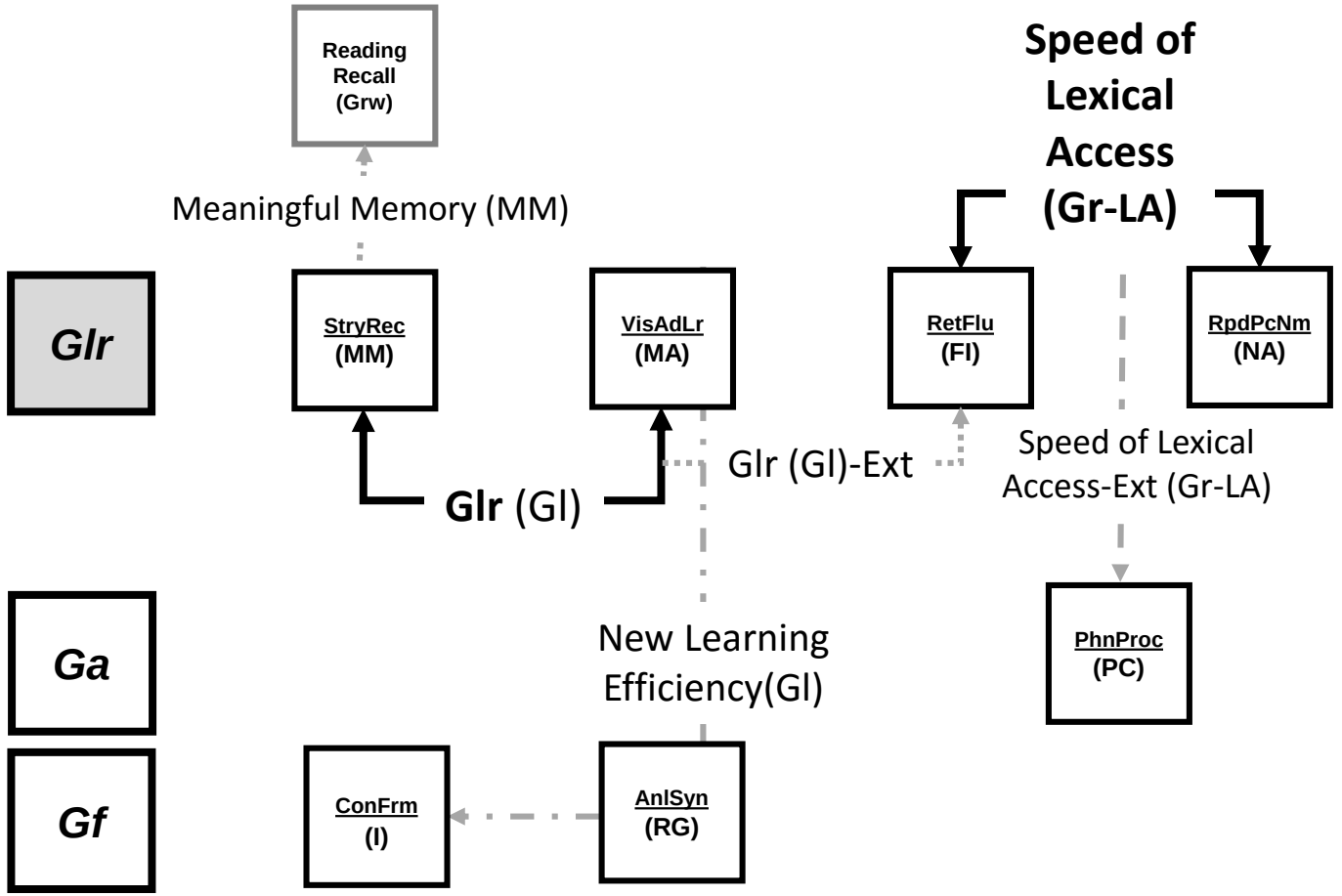
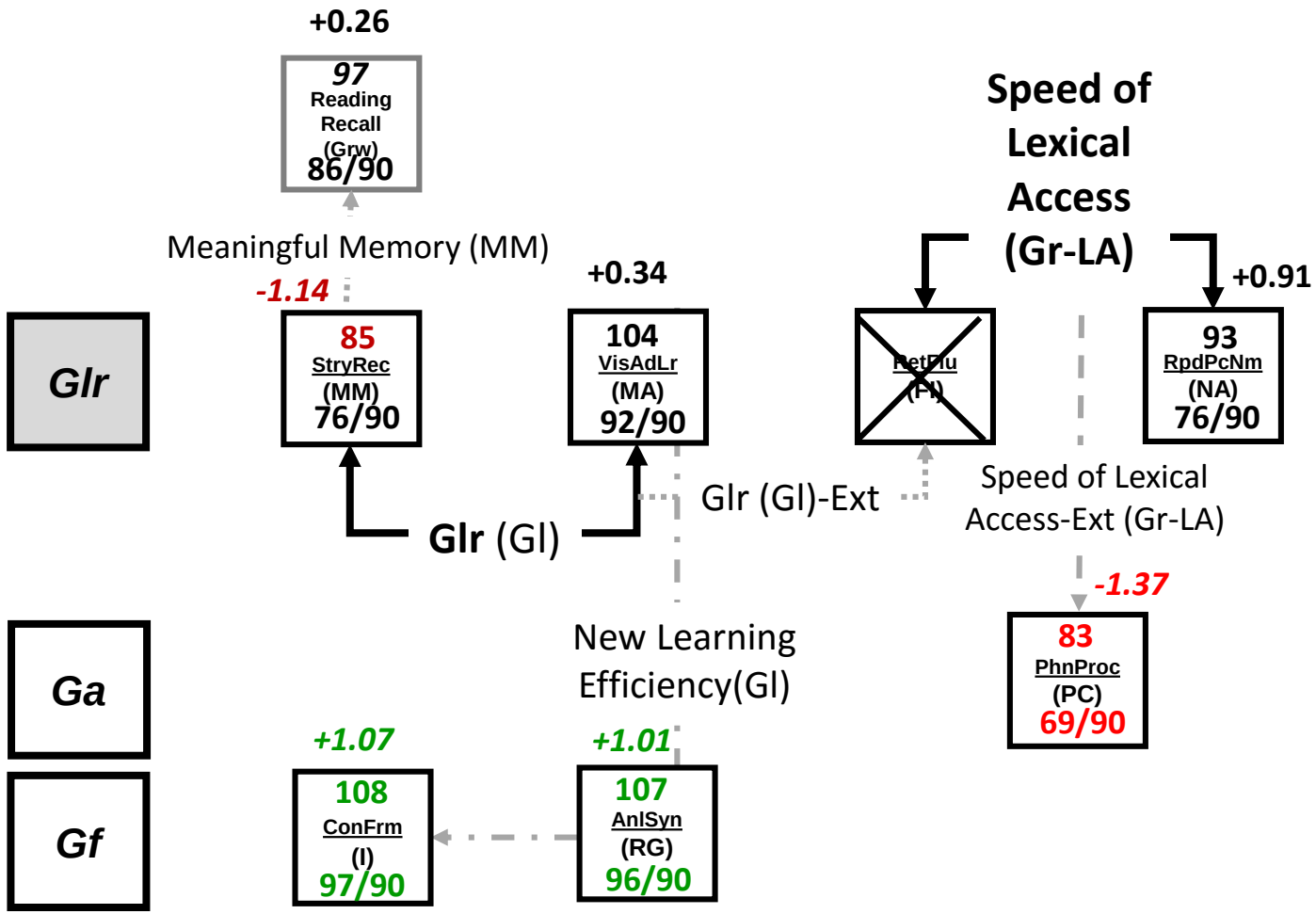


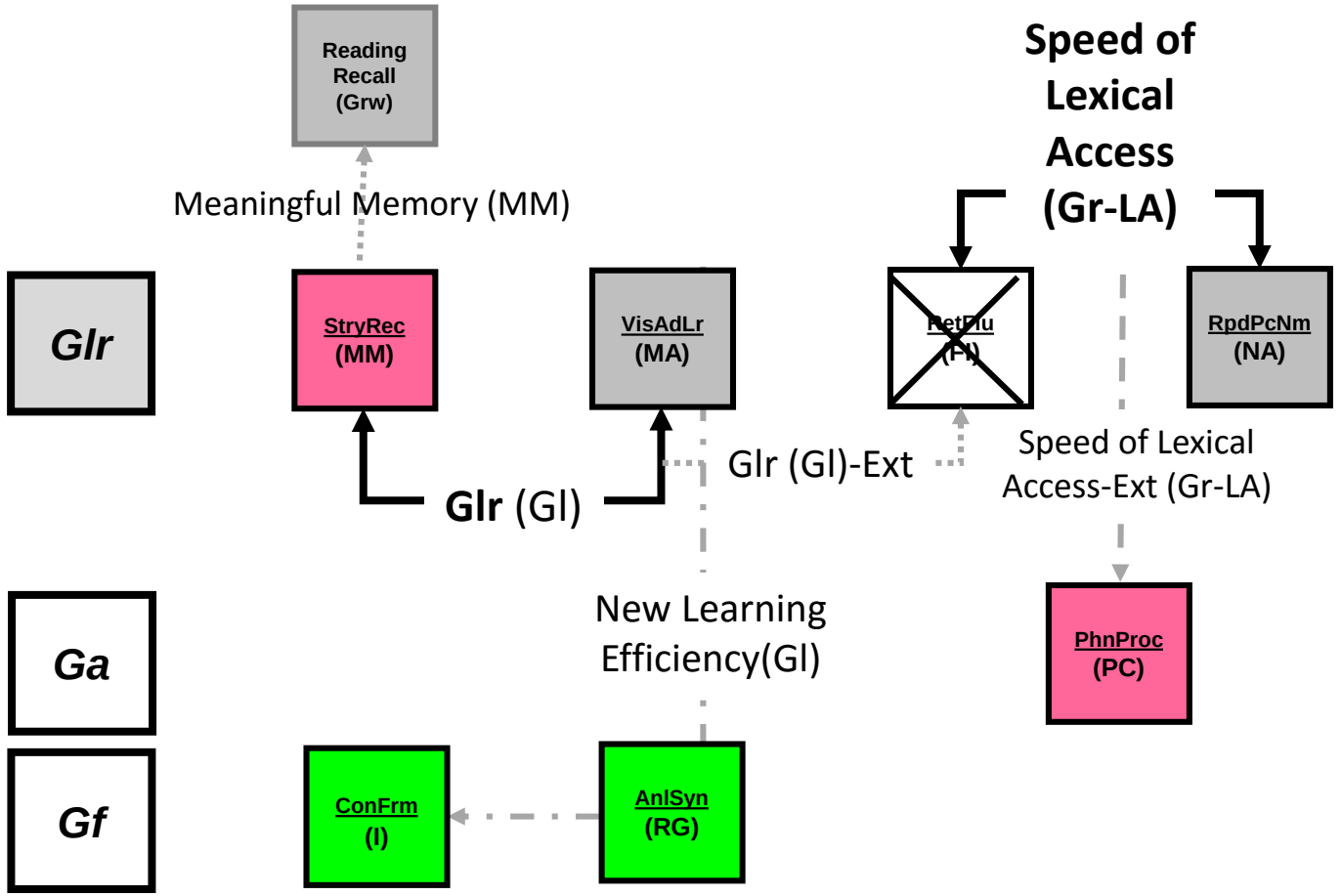
Within CHC domain assessment & interpretation tree - *Glr*

Dr. Kevin McGrew 12-28-15



Within CHC domain assessment & interpretation tree - *Glr*

Dr. Kevin McGrew 12-28-15



Conclusion

Although many of Patrick's test scores were within the Average range, he demonstrated very limited to limited proficiency on all reading and spelling tests. What is of greatest concern is the fact that Patrick has made insufficient academic progress in reading even with substantial additional assistance from both home and school. Although he has received targeted reading instruction with the Spalding method since kindergarten, he continues to struggle using phonics, pronouncing multisyllabic words, and reading at an adequate rate. The persistence and relative severity of his reading difficulties, his slow processing speed, his limited response to systematic interventions, his slow word perception, and the types of reading and spelling errors he makes, all support the conclusion that Patrick has a severe reading disorder. In addition, his mild difficulties regulating attention also interfere with his listening and learning. School programming considerations and instructional goals and strategies are provided below to address Patrick's weaknesses while building upon many of his well-developed skills.

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

Oral Vocab. | Number Series | Verbal Attention | Story Recall | Visual-ization | Phon. Proc. | Letter-Pattern Matching

94
80/90

Vocabulary (VL) → Picture Vocab.

Gf → Concept Formation

Gwm → Numbers Reversed → Under Directions; Sentence Repetition

Story Recall → Rapid Pic. Nam.

Glr → Vis. Aud. Lrn.

Ga → Nonword Repetition → Segmen-tation → **Phonetic Coding (PC)** → Sound Blending

Phono→lex Knowledge?

Perceptual Speed (P) → Number-Pattern Matching → ***Gs*** → Pair Canc.

Ortho. Aware.

High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

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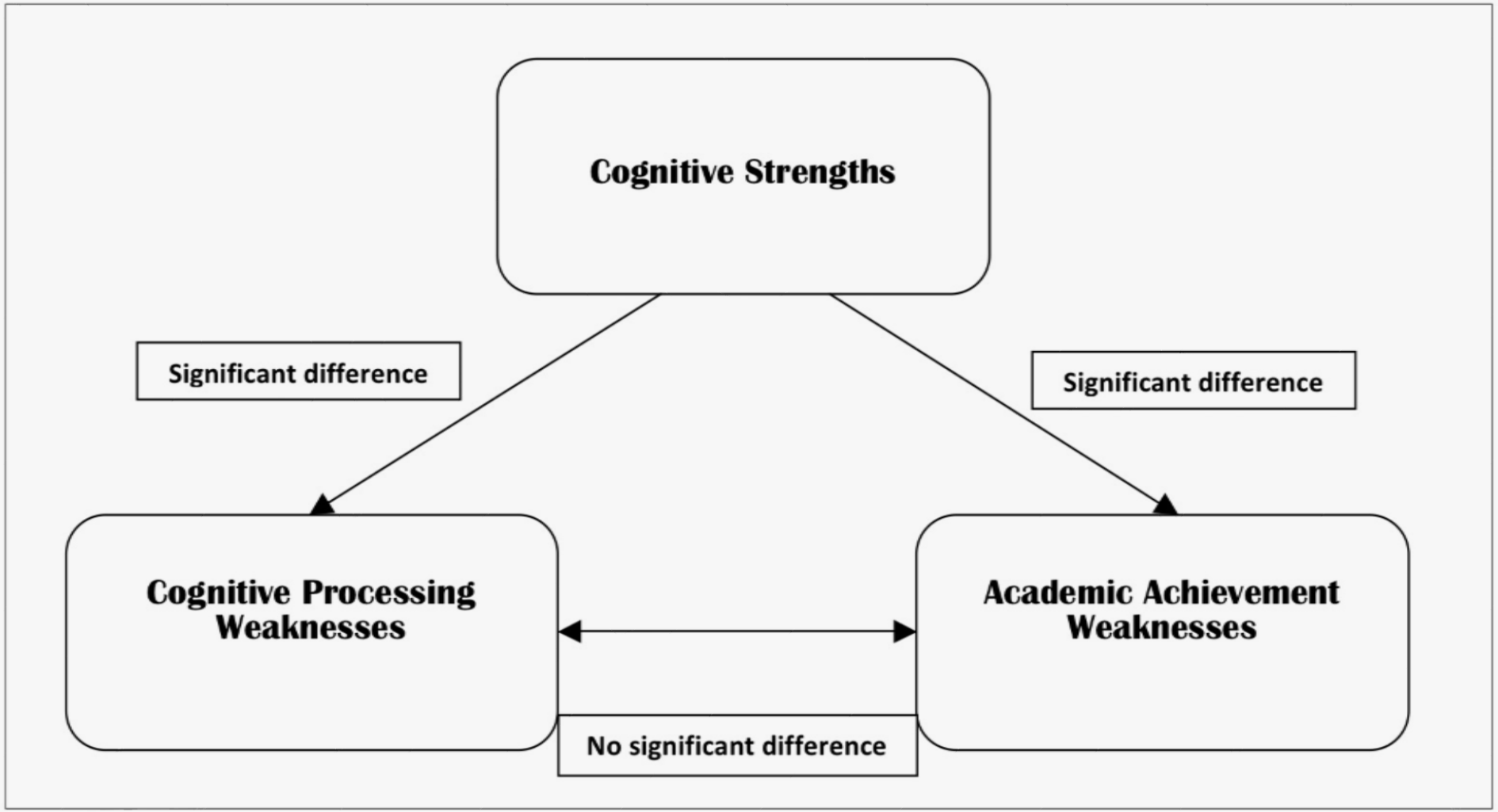


Figure 1. Pattern of Strengths and Weaknesses Conceptual Model.

Cognitive & achievement strengths

- **Gc-Vocabulary**
- **Gf-Fluid Reasoning**
- Gv(?)
- Ga-Phonetic coding (phon. proc.)

- Math achievement
- Reading comprehension
- Writing achievement

Is there internal cog/ach strength consistency?

Significant difference

Significant difference

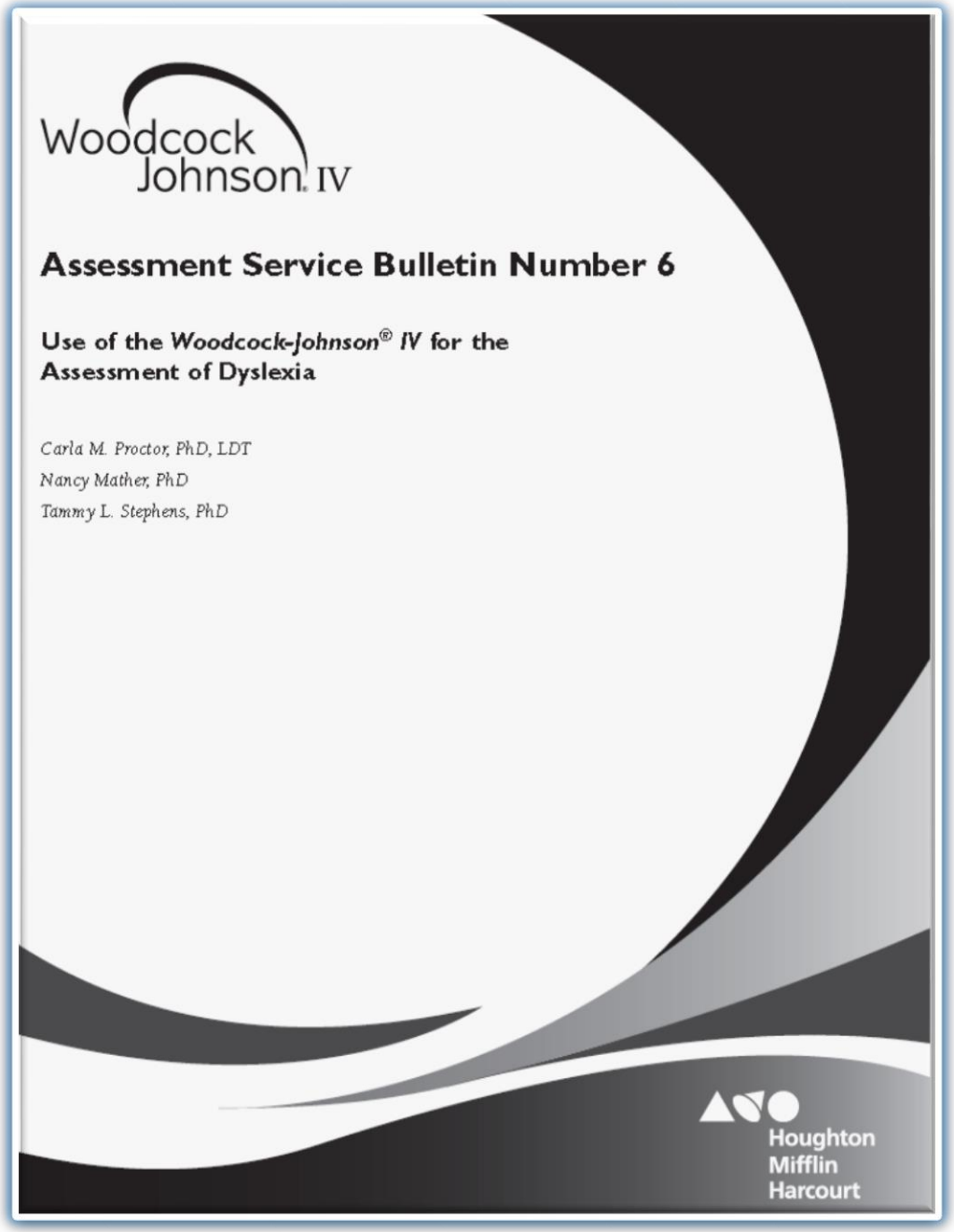
Cog. proc. weaknesses

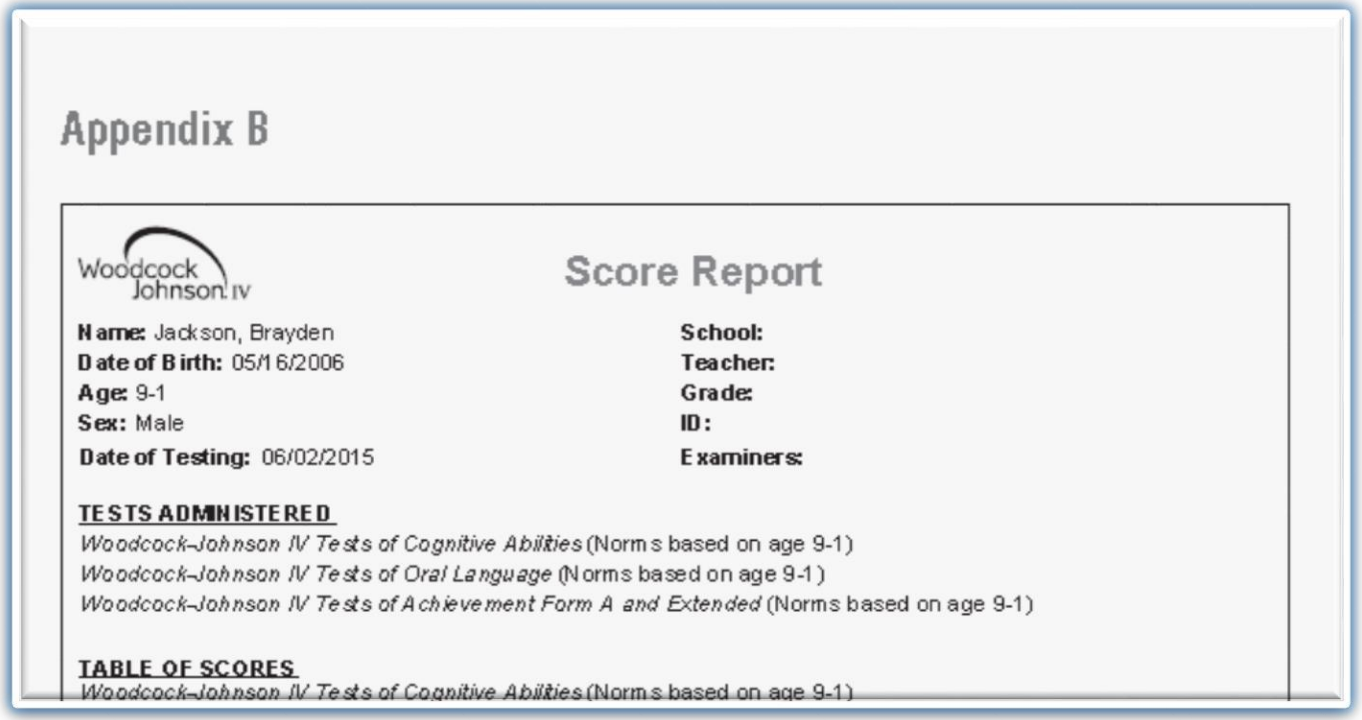
Academic weaknesses

- Gwm
- Gs-Perceptual speed
- Ga-Phono→lex. know. (access)
- Orthographic awareness

No difference (consistency)

- Basic reading skills
- Reading fluency
- Reading rate





Patrick is Brayden in ASB 6

Figure 1.

Scores in Primary Reading and Writing Difficulties.

WJ IV Dyslexia Profile of Scores

Area Tested		Battery	Test Date	Cluster/Test	Low/Below Average SS <40–89 PR <1–24	Average SS 90–110 PR 25–75	High/Above Average SS >110 PR >75	RPI	Comments
Primary Reading and Writing Difficulties	Letter-Sound	Informal		Letter Identification: Case: Lower __/26 Upper __/26 Letter sounds: C __/21 V __/5 (short)					
	Basic Read. Skills	WJ IV ACH		Test 1: Letter-Word Identification				__/90	
				Test 7: Word Attack				__/90	
	Reading Fluency (rate & accuracy)	WJ IV ACH		**Reading Fluency**				__/90	
				Test 8: Oral Reading				__/90	
				Test 9: Sentence Reading Fluency				__/90	
				Reading Rate				__/90	
				Test 9: Sentence Reading Fluency				__/90	
				Test 15: Word Reading Fluency				__/90	
	Spell.	WJ IV ACH		Test 3: Spelling				__/90	
				Test 16: Spelling of Sounds				__/90	
	Phoneme-Grapheme Knowledge	WJ IV ACH		**Phoneme-Grapheme Knowledge**				__/90	
				Test 7: Word Attack				__/90	
				Test 16: Spelling of Sounds				__/90	

Figure 3.
Relevant Cognitive Ability scores.

WJ IV Dyslexia Profile of Scores

Area Tested		Battery	Test Date	Cluster/Test	Low/Below Average SS <40–89 PR <1–24	Average SS 90–110 PR 25–75	High/Above Average SS >110 PR >75	RPI	Comments
Cognitive Abilities: Possible Contributing Factors	Phonological Awareness	WJ IV COG		**Auditory Processing**				__/90	
				Test 5: Phonological Processing				__/90	
				Test 12: Nonword Repetition				__/90	
		WJ IV OL		**Phonetic Coding**				__/90	
				Test 3: Segmentation				__/90	
				Test 7: Sound Blending				__/90	
				Test 9: Sound Awareness				__/90	
	Orthographic Awareness	WJ IV COG		Test 4: Letter-Pattern Matching				__/90	
				Test 11: Number-Pattern Matching				__/90	
		WJ IV ACH		Test 1: Letter-Word Identification				__/90	
				Test 3: Spelling				__/90	
				Test 7: Word Attack				__/90	
				Test 16: Spelling of Sounds				__/90	
	Memory	WJ IV OL		**Auditory Memory Span**				__/90	
				Test 5: Sentence Repetition				__/90	
		WJ IV COG		Test 18: Memory for Words				__/90	
				Short-Term Working Memory ☐ Extended				__/90	
				Test 3: Verbal Attention				__/90	
				Test 10: Numbers Reversed				__/90	
				Test 16: Object-Number Sequencing (Extended)				__/90	
	Rapid Naming	WJ IV OL		**Speed of Lexical Access**				__/90	
				Test 4: Rapid Picture Naming				__/90	
				Test 8: Retrieval Fluency				__/90	
	Processing Speed	WJ IV COG		**Cognitive Processing Speed (*Gs*)**				__/90	
				Test 4: Letter-Pattern Matching				__/90	
				Test 17: Pair Cancellation				__/90	
		WJ IV COG		**Perceptual Speed**				__/90	
				Test 4: Letter-Pattern Matching				__/90	
				Test 11: Number-Pattern Matching				__/90	

Figure 4.

Scores not related to reading: possible strengths.

WJ IV Dyslexia Profile of Scores

Area Tested		Battery	Test Date	Cluster/Test	Low/Below Average SS <40–89 PR <1–24	Average SS 90–110 PR 25–75	High/Above Average SS >110 PR >75	RPI	Comments
Ability to Learn Independent of Reading	General Intelligence	WJ IV COG		**General Intellectual Ability (GIA)**				___/90	
				Test 1: Oral Vocabulary (*Gc*)				___/90	
				Test 2: Number Series (*Gf*)				___/90	
				Test 3: Verbal Attention (*Gwm*)				___/90	
				Test 4: Letter-Pattern Matching (*Gs*)				___/90	
				Test 5: Phonological Processing (*Ga*)				___/90	
				Test 6: Story Recall (*Glr*)				___/90	
				Test 7: Visualization (*Gv*)				___/90	
	Reasoning and Knowledge	WJ IV COG		***Gf-Gc* Composite**				___/90	
				Test 1: Oral Vocabulary (*Gc*)				___/90	
				Test 2: Number Series (*Gf*)				___/90	
				Test 8: General Information (*Gc*)				___/90	
				Test 9: Concept Formation (*Gf*)				___/90	
	Oral Language	WJ IV OL		**Oral Expression**				___/90	
				Test 1: Picture Vocabulary				___/90	
				Test 5: Sentence Repetition				___/90	
				Listening Comprehension				___/90	
				Test 2: Oral Comprehension				___/90	
				Test 6: Understanding Directions				___/90	
				Vocabulary				___/90	
				Test 1: Picture Vocabulary				___/90	
		WJ IV COG		Test 1: Oral Vocabulary				___/90	
	Math	WJ IV ACH		**Math Calculation Skills**				___/90	
				Test 5: Calculation				___/90	
				Test 10: Math Facts Fluency				___/90	
				Math Problem Solving				___/90	
				Test 2: Applied Problems				___/90	
				Test 13: Number Matrices				___/90	
	Academic Knowledge	WJ IV ACH		**Academic Knowledge**				___/90	
				Test 18: Science				___/90	
				Test 19: Social Studies				___/90	
				Test 20: Humanities				___/90	
		WJ IV COG		Test 8: General Information				___/90	

WJ IV Basic Reading Skills and Comprehension– Core GIA+ cluster *ach-domain* tree

Gc Gf Gwm Glr Gv Ga Gs

GIA

94
80/90

Oral Vocab. → Vocabulary (VL) → Picture Vocab.

Number Series → *Gf* → Concept Formation

Verbal Attention → *Gwm* → Numbers Reversed → ~~Under Directions~~ / Sentence Repetition

Story Recall → Rapid Pic. Nam.

Visual-ization

Phon. Proc. → *Ga* → Nonword Repetition → Segmen-tation → **Phonetic Coding (PC)** → Sound Blending

Letter-Pattern Matching → **Perceptual Speed (P)** → Number-Pattern Matching → *Gs* → Pair Canc.

Ortho. Aware.

Glr → Vis. Aud. Lrn.

XBA VWM testing?

Phono→lex Knowledge?

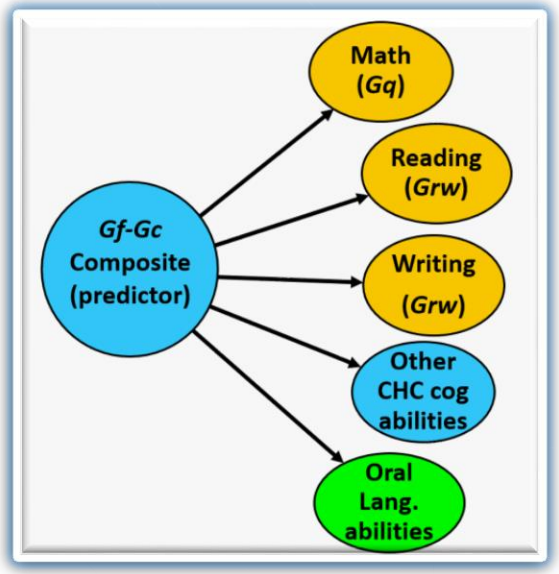
High

Strength of empirical relation (correlation) with BRS and RC clusters in norm data (ages 6 to 19)

Low

Cognitive & achievement strengths

- **Gc-Vocabulary**
- **Gf-Fluid Reasoning**
- Gv(?)
- Ga-Phonetic coding (phon. proc.)
- Math achievement
- Reading comprehension
- Writing achievement



Significant difference

Significant difference

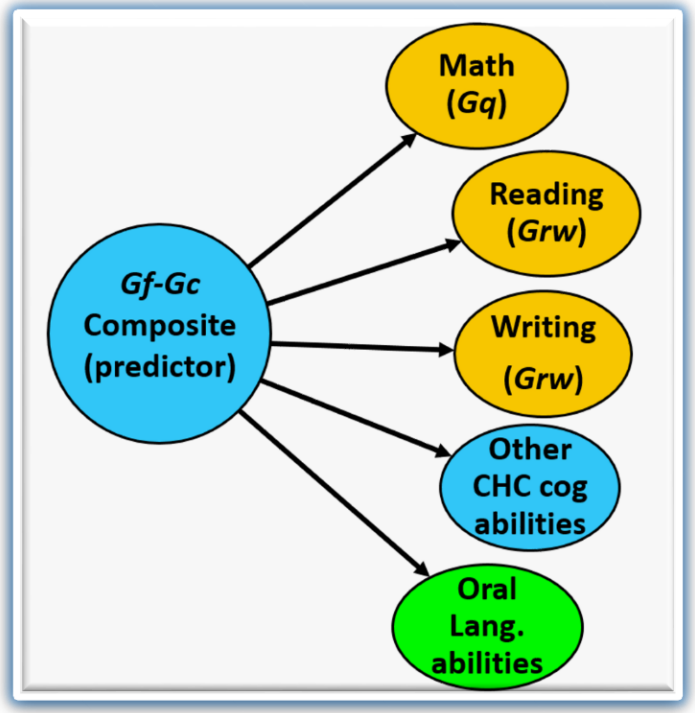
Cog. proc. weaknesses

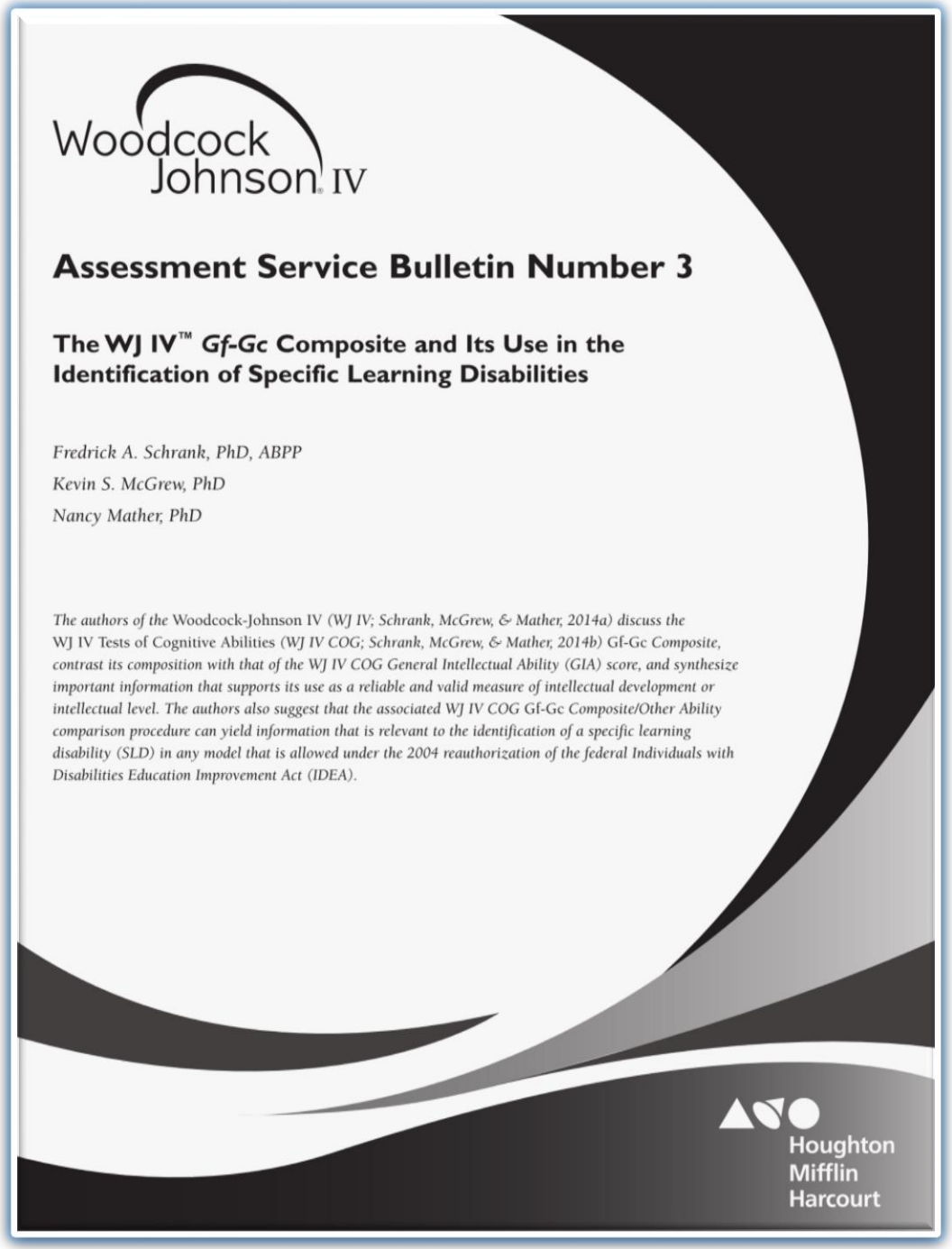
Academic weaknesses

- Gwm
- Gs-Perceptual speed
- Ga-Phono→lex. know. (access)
- Orthographic awareness

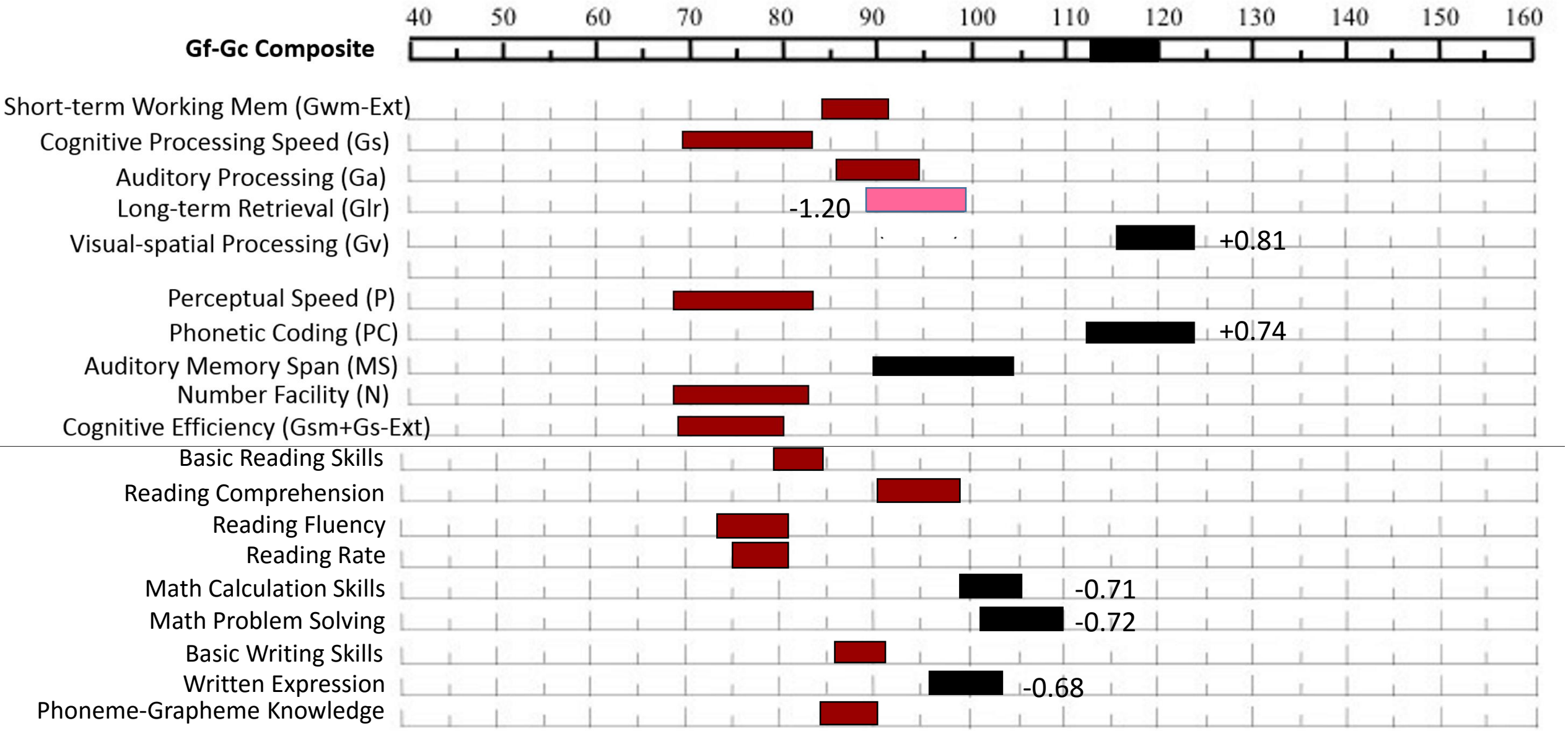
No difference (consistency)

- Basic reading skills
- Reading fluency
- Reading rate


Math
(Gq)
Reading
(Grw)
Gf-Gc
Composite
(predictor)
Writing
(Grw)
Other
CHC cog
abilities
Oral
Lang.
abilities


Woodcock Johnson IV
Assessment Service Bulletin Number 3
The WJ IV™ Gf-Gc Composite and Its Use in the Identification of Specific Learning Disabilities
Fredrick A. Schrank, PhD, ABPP
Kevin S. McGrew, PhD
Nancy Mather, PhD
The authors of the Woodcock-Johnson IV (WJ IV; Schrank, McGrew, & Mather, 2014a) discuss the WJ IV Tests of Cognitive Abilities (WJ IV COG; Schrank, McGrew, & Mather, 2014b) Gf-Gc Composite, contrast its composition with that of the WJ IV COG General Intellectual Ability (GIA) score, and synthesize important information that supports its use as a reliable and valid measure of intellectual development or intellectual level. The authors also suggest that the associated WJ IV COG Gf-Gc Composite/Other Ability comparison procedure can yield information that is relevant to the identification of a specific learning disability (SLD) in any model that is allowed under the 2004 reauthorization of the federal Individuals with Disabilities Education Improvement Act (IDEA).
Houghton Mifflin Harcourt

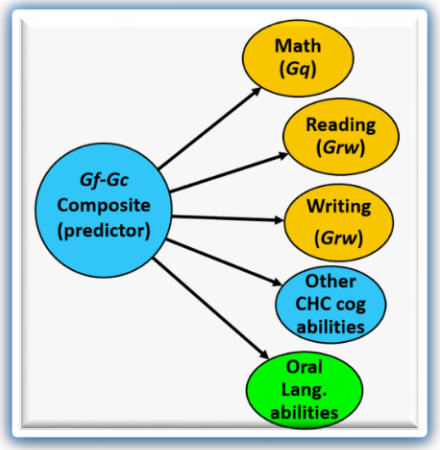
Significant broad, narrow & clinical COG/ACH strengths/weaknesses: **Gf-Gc Composite** procedure (+-1.5 SD) – Patrick case study



Cognitive & achievement strengths

If full-blown assessment

- Gf-Gc
- Gv?
- Ga-Phonetic Coding?



Significant difference

Significant difference

Cog. proc. weaknesses

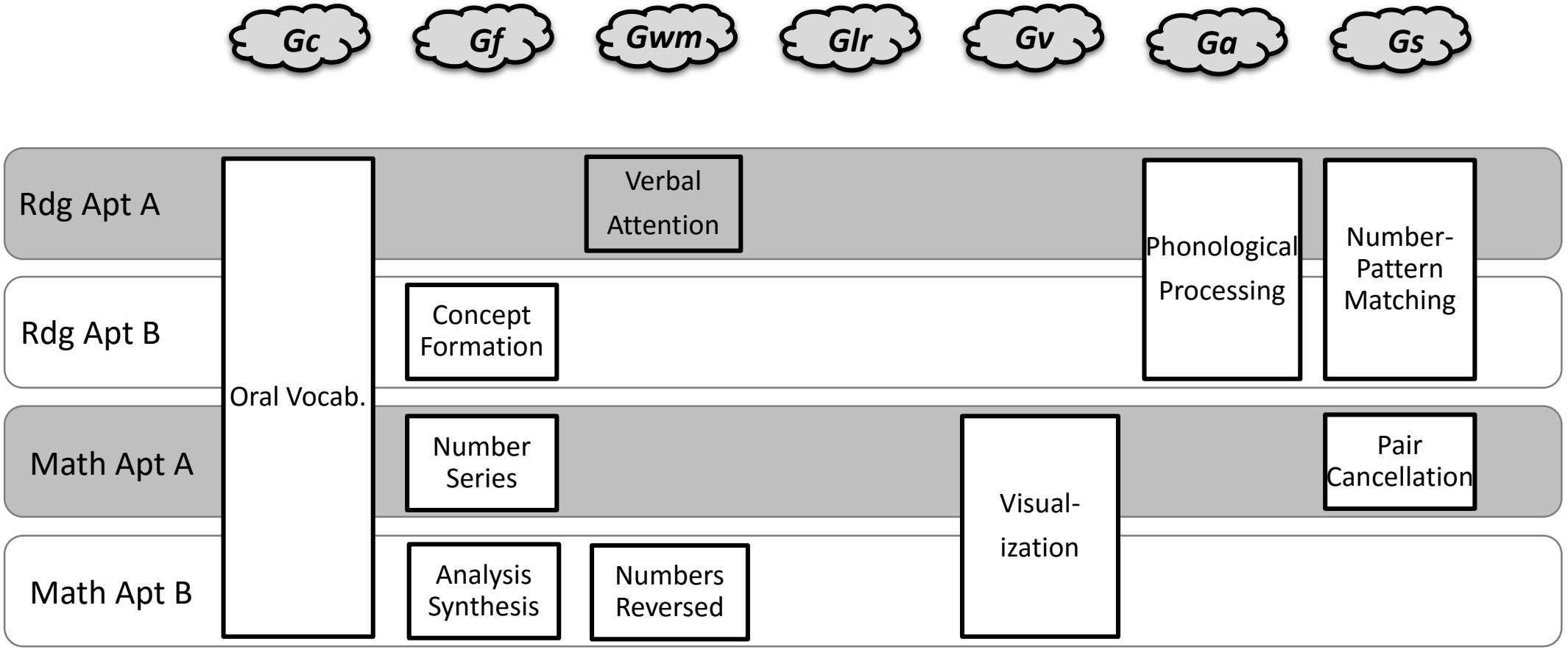
- Gwm (Ext)
- Gs
- Gs-Perceptual speed
- Glr?
- ~~Number Facility~~
- Cog. Efficiency (Ext)

No difference (consistency)

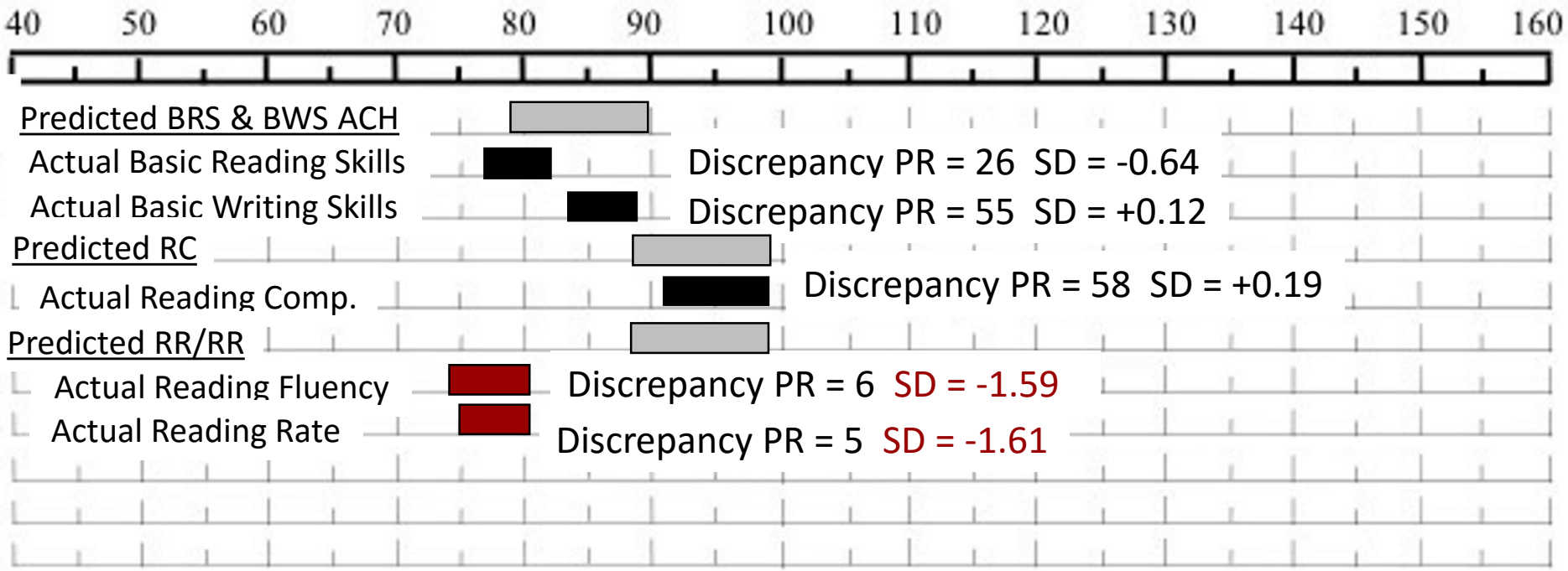
Academic weaknesses

- Basic Reading Skills
- Reading Comprehension
- Reading Fluency
- Reading Rate
- Basic Writing Skills
- Phoneme-Grapheme Know.

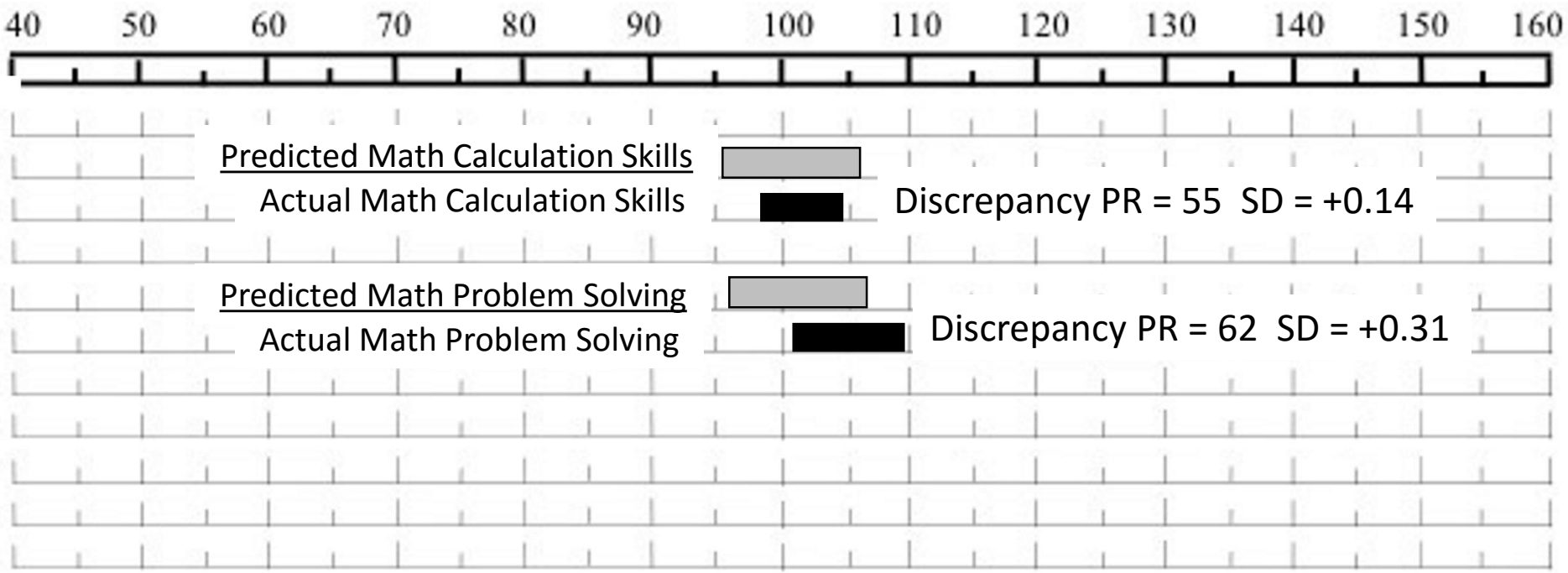
Composition of WJ IV reading and math scholastic aptitude clusters



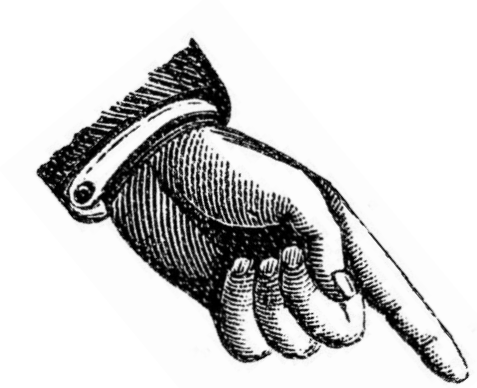
WJ IV Patrick case study:
Reading scholastic aptitude/achievement comparisons (+-1.5 SD):



WJ IV Patrick case study:
Math scholastic aptitude/achievement comparisons (+-1.5 SD):

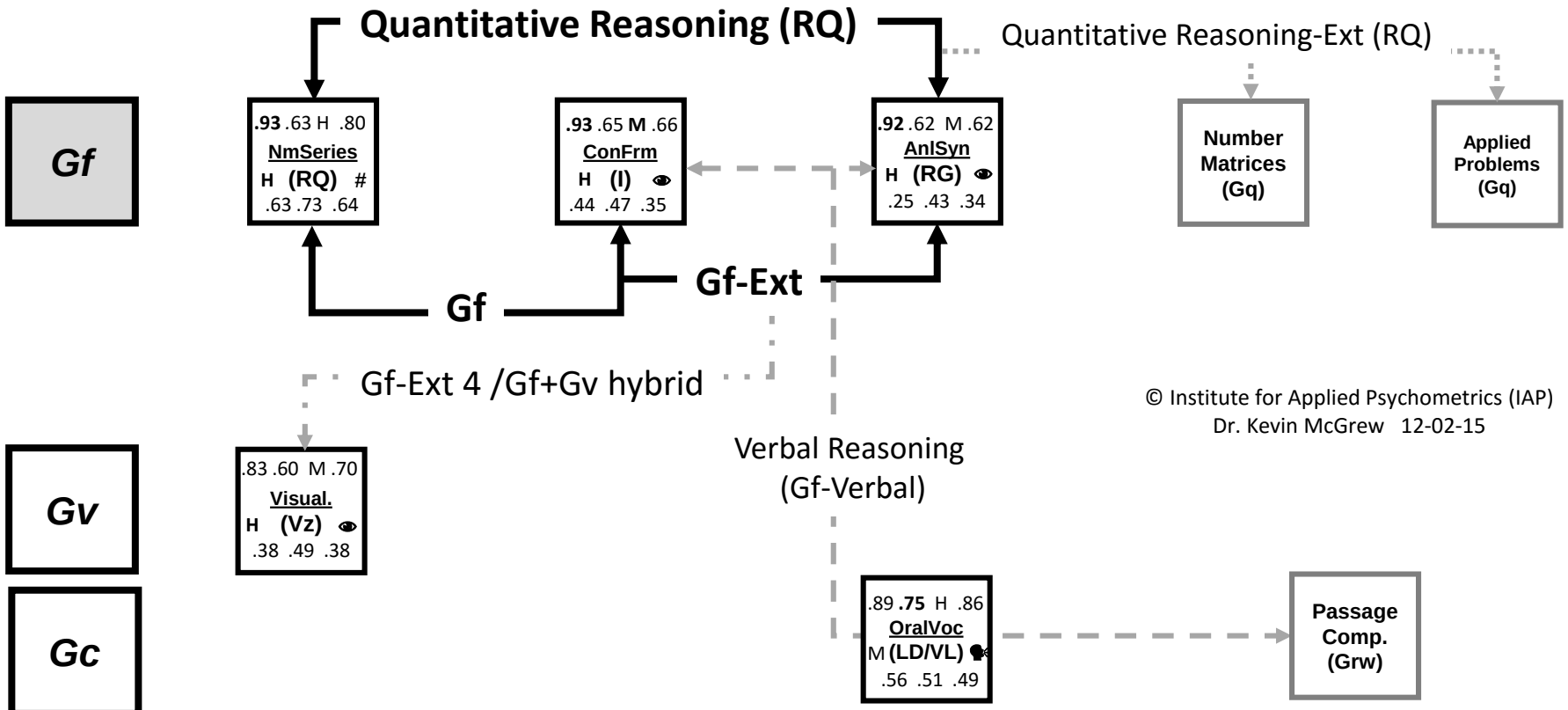


Within CHC-domain assessment and interpretation trees: "Drilling down" in the CHC domain



Psychometrically-detailed within CHC-domain assessment and interpretation trees

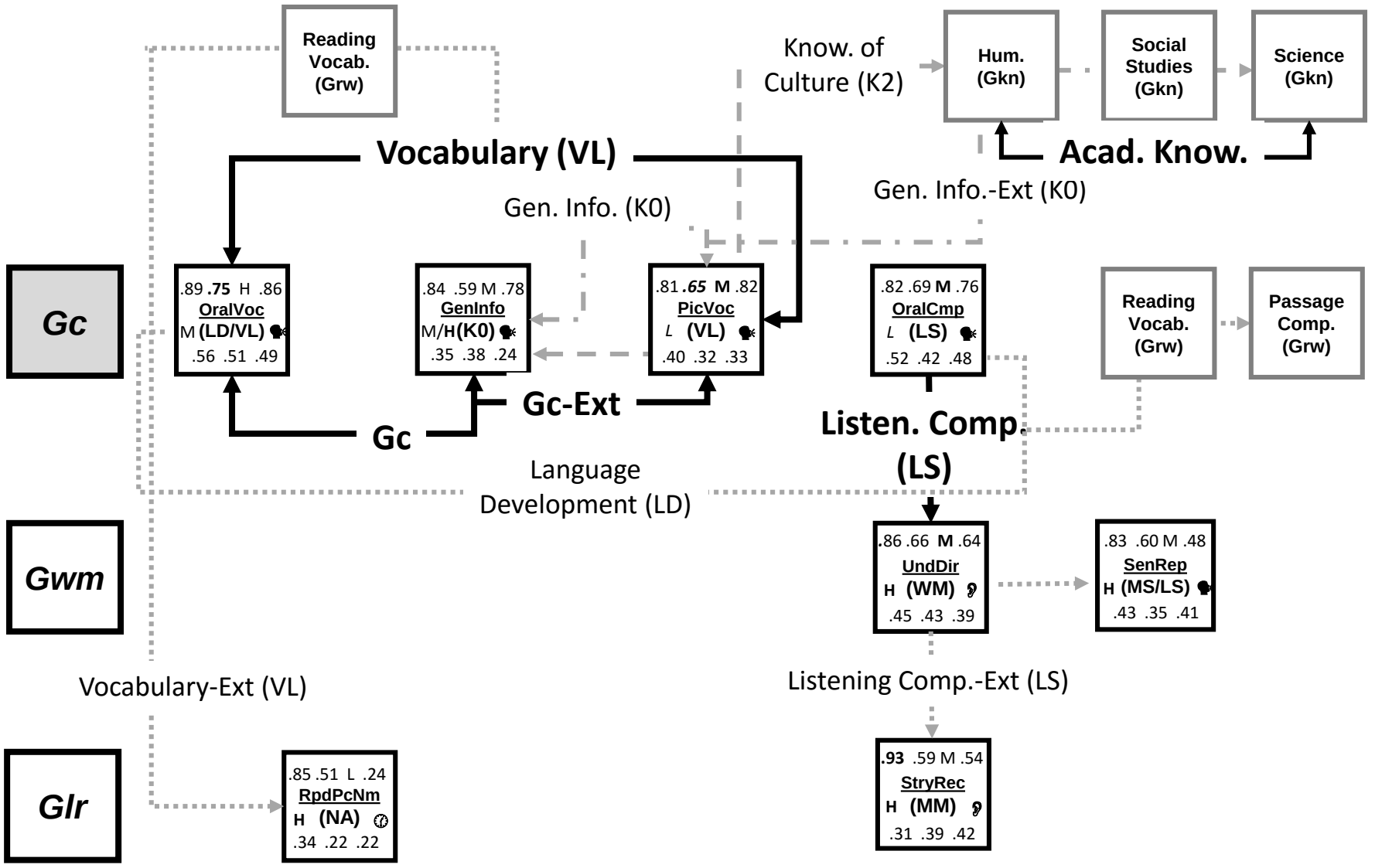
Within CHC domain assessment tree - *Gf*



Pearson Correlation Matrix

	NUMSER	CONFRM	ANLSYN	NUMMAT	APPROB	ORLVOC	PSGCMP
NUMSER	1.00						
CONFRM	0.47	1.00					
ANLSYN	0.44	0.51	1.00				
NUMMAT	0.65	0.43	0.45	1.00			
APPROB	0.70	0.54	0.49	0.58	1.00		
ORLVOC	0.48	0.47	0.39	0.48	0.62	1.00	
PSGCMP	0.62	0.43	0.31	0.42	0.59	0.64	1.00

Within CHC domain assessment tree - *Gc*



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Pearson Correlation Matrix													
	ORLVOC	GENINF	PICVOC	ORLCMP	STYREC	UNDDIR	SENREP	RPCNAM	SCI	SOC	HUM	RDGVOC	PSGCMP
ORLVOC	1.00												
GENINF	0.71	1.00											
PICVOC	0.70	0.69	1.00										
ORLCMP	0.65	0.54	0.65	1.00									
STYREC	0.41	0.32	0.38	0.46	1.00								
UNDDIR	0.42	0.28	0.40	0.45	0.42	1.00							
SENREP	0.47	0.32	0.44	0.51	0.28	0.49	1.00						
RPCNAM	0.30	0.24	0.38	0.37	0.18	0.39	0.28	1.00					
SCI	0.58	0.44	0.64	0.60	0.48	0.45	0.45	0.30	1.00				
SOC	0.71	0.59	0.69	0.62	0.45	0.39	0.44	0.32	0.71	1.00			
HUM	0.63	0.62	0.64	0.57	0.35	0.40	0.44	0.29	0.64	0.66	1.00		
RDGVOC	0.73	0.61	0.64	0.68	0.41	0.37	0.50	0.26	0.62	0.62	0.62	1.00	
PSGCMP	0.64	0.53	0.53	0.59	0.36	0.44	0.45	0.28	0.49	0.49	0.42	0.71	1.00

Within CHC domain assessment tree - *Ga*

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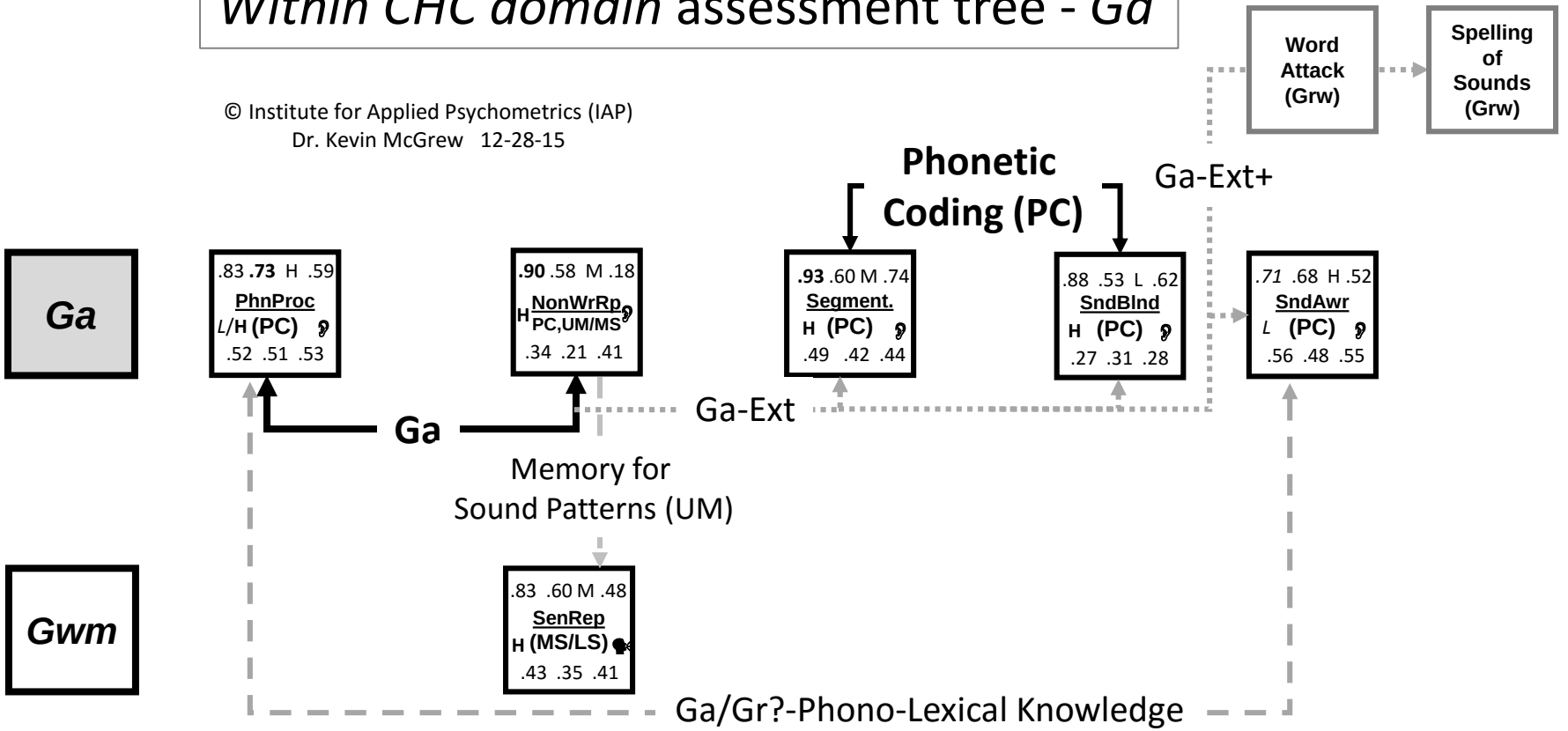
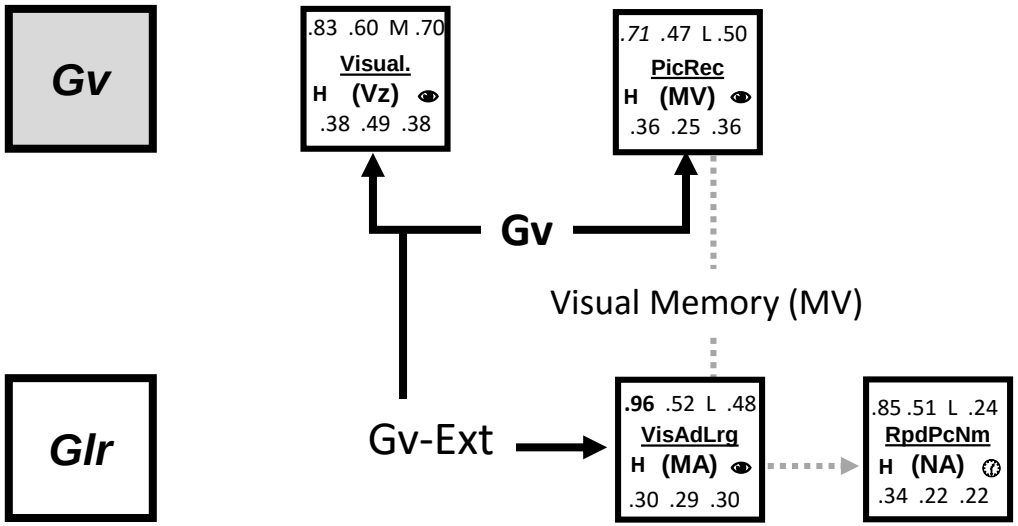


Pearson Correlation Matrix

	PHNPRO	NWDREP	SEGMNT	SNDBLN	SNDAWR	SENREP	WRDATK	SPLSND
PHNPRO	1.00							
NWDREP	0.37	1.00						
SEGMNT	0.59	0.37	1.00					
SNDBLN	0.48	0.33	0.44	1.00				
SNDAWR	0.59	0.43	0.49	0.43	1.00			
SENREP	0.48	0.50	0.32	0.18	0.41	1.00		
WRDATK	0.51	0.42	0.44	0.36	0.55	0.46	1.00	
SPLSND	0.56	0.40	0.55	0.47	0.62	0.38	0.67	1.00

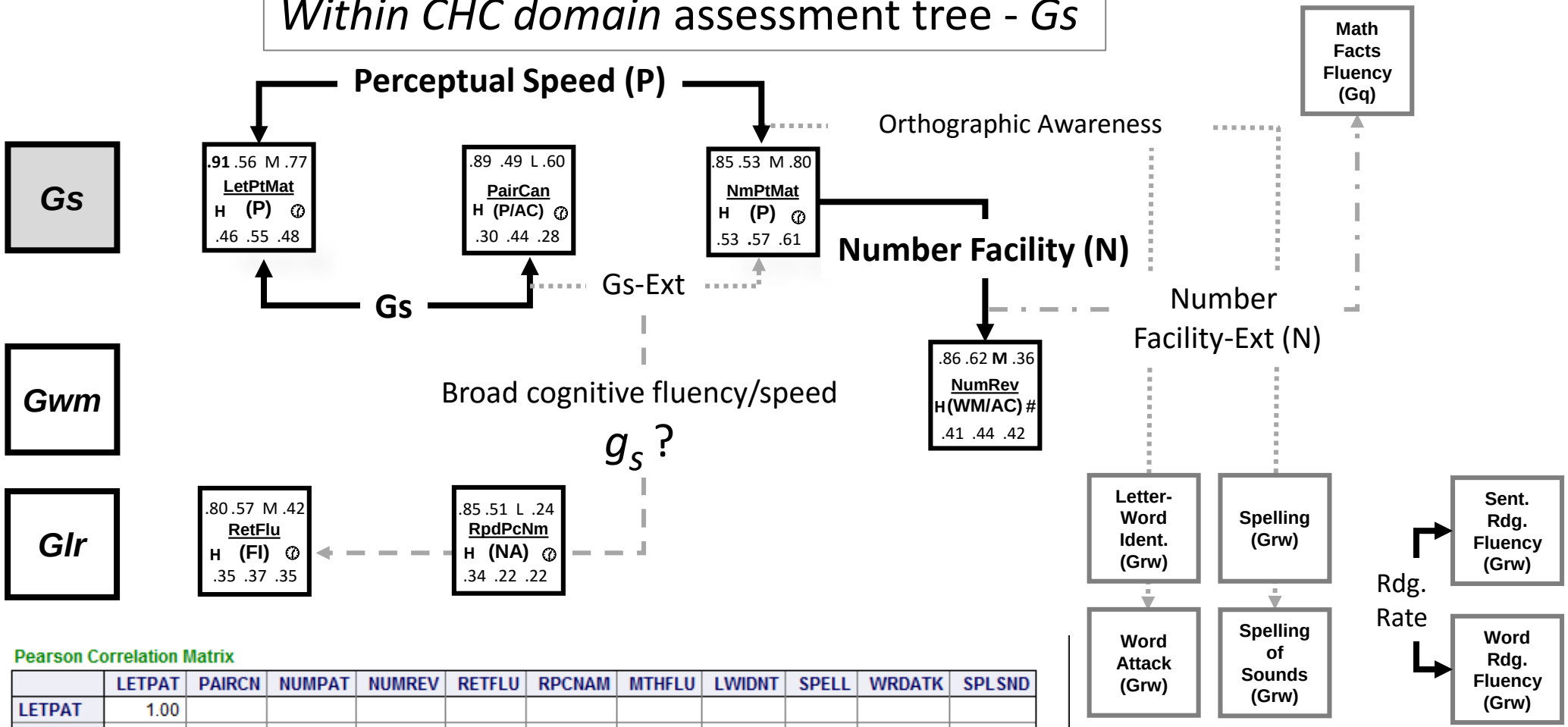
Within CHC domain assessment tree - *Gv*



Pearson Correlation Matrix

	VISUAL	PICREC	VAL	RPCNAM
VISUAL	1.00			
PICREC	0.43	1.00		
VAL	0.41	0.32	1.00	
RPCNAM	0.19	0.34	0.19	1.00

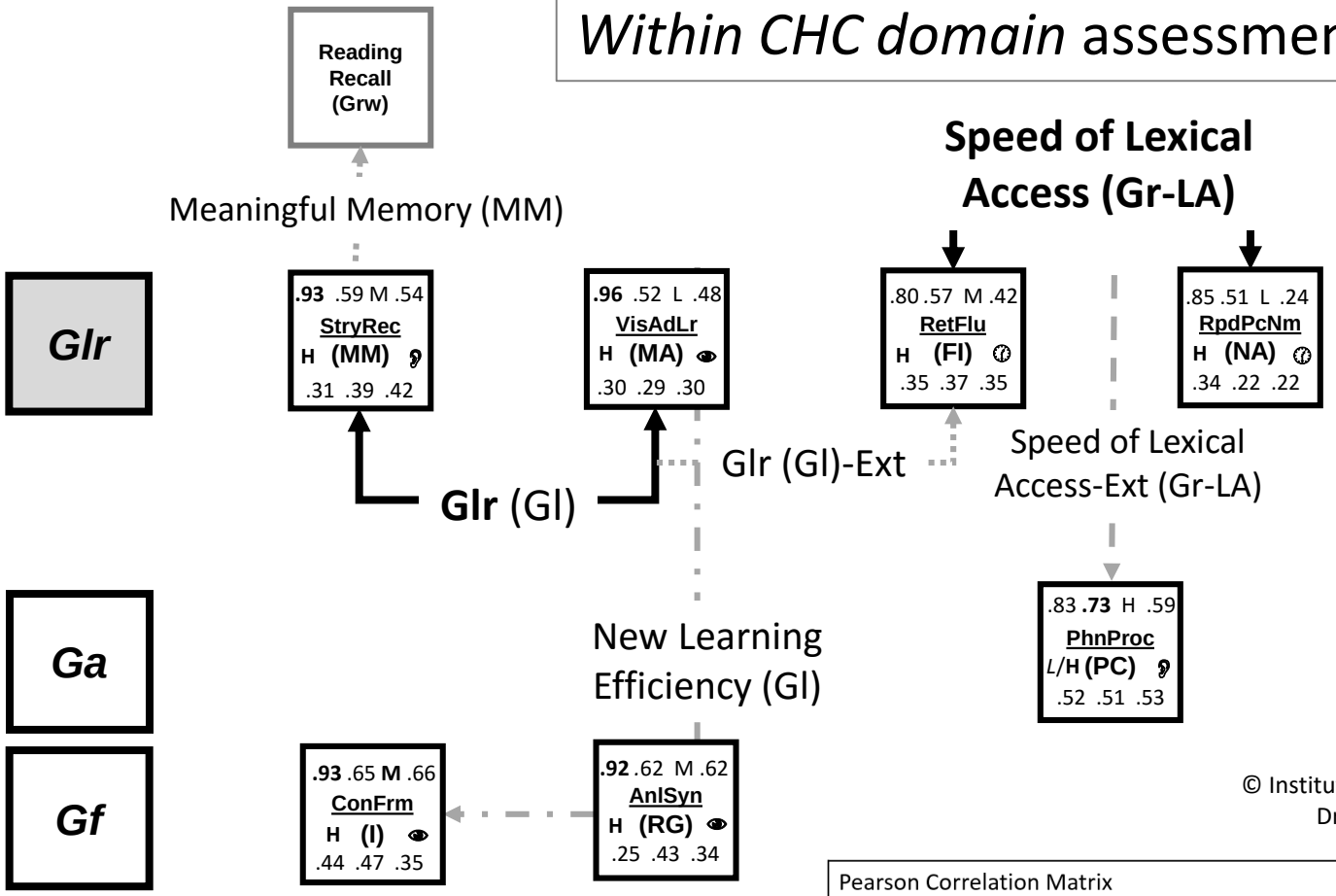
Within CHC domain assessment tree - *Gs*



Pearson Correlation Matrix

	LETPAT	PAIRCN	NUMPAT	NUMREV	RETFLU	RPCNAM	MTHFLU	LWIDNT	SPELL	WRDATK	SPLSND
LETPAT	1.00										
PAIRCN	0.58	1.00									
NUMPAT	0.60	0.56	1.00								
NUMREV	0.44	0.29	0.35	1.00							
RETFLU	0.32	0.35	0.36	0.29	1.00						
RPCNAM	0.32	0.37	0.32	0.25	0.45	1.00					
MTHFLU	0.57	0.45	0.55	0.40	0.34	0.32	1.00				
LWIDNT	0.38	0.31	0.47	0.41	0.32	0.28	0.55	1.00			
SPELL	0.43	0.35	0.48	0.42	0.33	0.23	0.61	0.81	1.00		
WRDATK	0.30	0.21	0.31	0.36	0.30	0.30	0.36	0.74	0.65	1.00	
SPLSND	0.34	0.30	0.30	0.45	0.24	0.23	0.46	0.61	0.62	0.66	1.00

Within CHC domain assessment tree - *Glr*

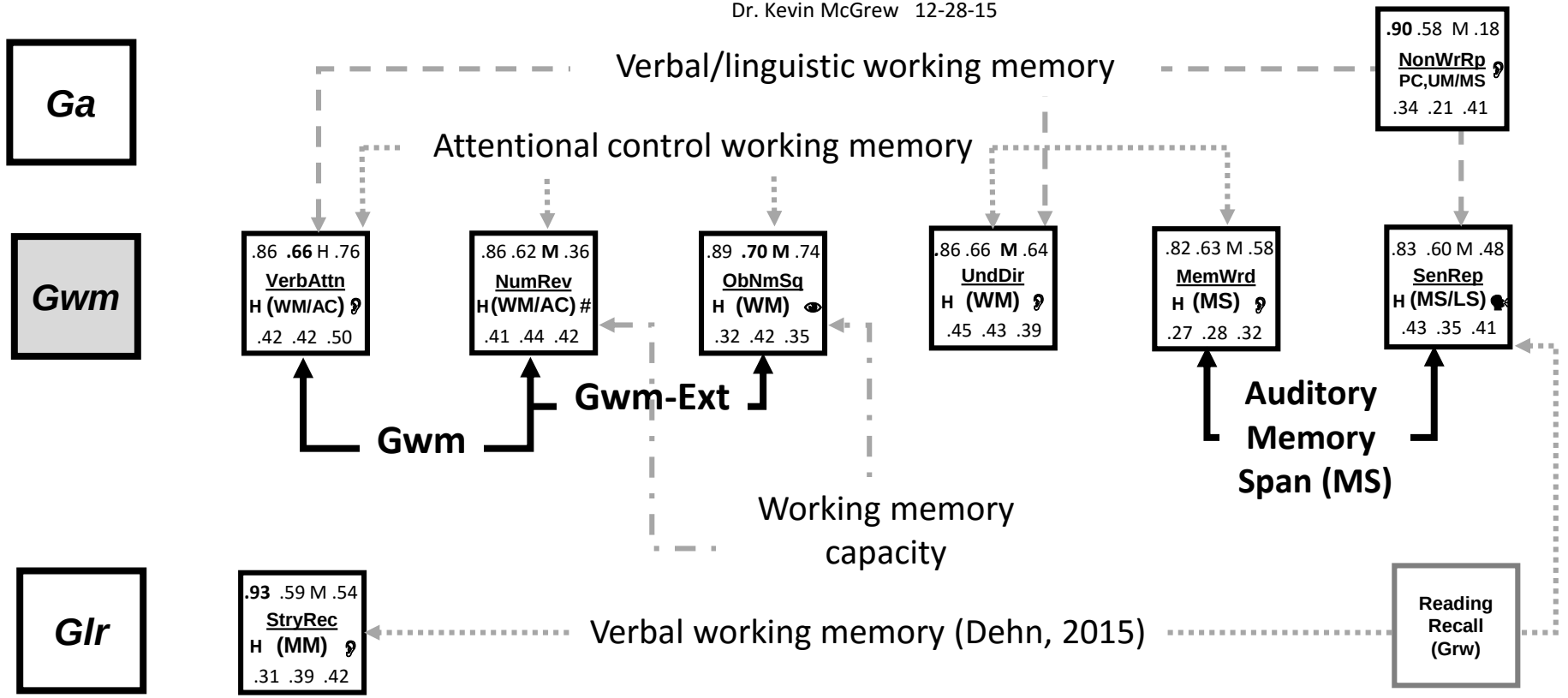


Pearson Correlation Matrix

	STYREC	RDGREC	VAL	RETFLU	RPCNAM	PHNPRO	CONFRM	ANLSYN
STYREC	1.00							
RDGREC	0.32	1.00						
VAL	0.34	0.22	1.00					
RETFLU	0.28	0.31	0.18	1.00				
RPCNAM	0.18	0.23	0.19	0.45	1.00			
PHNPRO	0.28	0.40	0.36	0.47	0.28	1.00		
CONFRM	0.35	0.43	0.44	0.28	0.32	0.44	1.00	
ANLSYN	0.41	0.27	0.36	0.42	0.21	0.35	0.52	1.00

Within CHC domain assessment tree - *Gwm*

Dr. Kevin McGrew 12-28-15



Pearson Correlation Matrix

	VRBATN	NUMREV	OBJNUM	UNDDIR	MEMWRD	SENREP	NWDREP	STYREC	RDGREC	VISUAL	ANLSYN
VRBATN	1.00										
NUMREV	0.47	1.00									
OBJNUM	0.56	0.48	1.00								
UNDDIR	0.46	0.33	0.43	1.00							
MEMWRD	0.51	0.43	0.50	0.37	1.00						
SENREP	0.48	0.29	0.39	0.49	0.49	1.00					
NWDREP	0.45	0.28	0.45	0.45	0.43	0.50	1.00				
STYREC	0.34	0.29	0.42	0.42	0.37	0.28	0.33	1.00			
RDGREC	0.34	0.28	0.27	0.33	0.18	0.28	0.22	0.32	1.00		
VISUAL	0.24	0.35	0.39	0.40	0.36	0.30	0.34	0.37	0.27	1.00	
ANLSYN	0.37	0.37	0.43	0.37	0.38	0.20	0.21	0.41	0.27	0.48	1.00