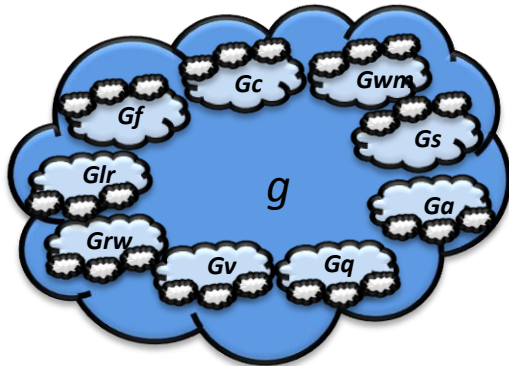


# CHC Theory 101



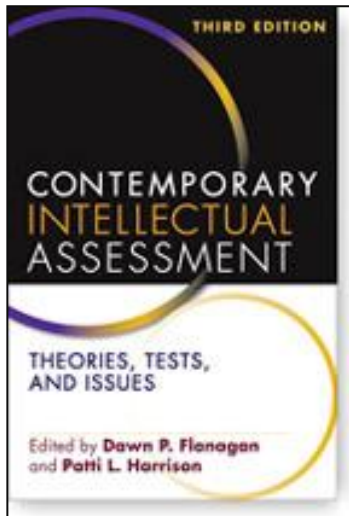
The CHC taxonomy of  
**cognitive** abilities codebook:

**Current status**

Dr. Kevin S. McGrew

Institute for Applied Psychometrics (IAP)

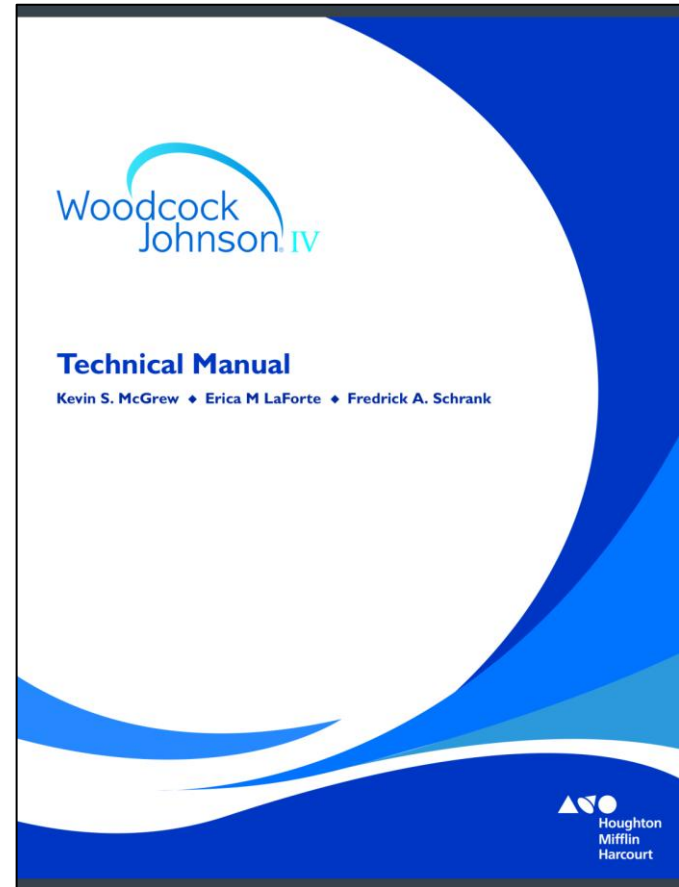
The CHC definitions included in this document are adapted from Schneider and McGrew (2012) and McGrew, LaForte and Schrank (2014), which include more in-depth definitions.

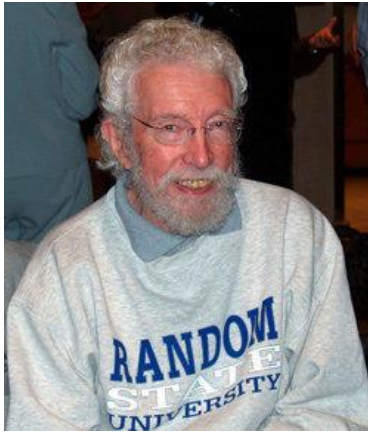


## CHAPTER 4

### The Cattell–Horn–Carroll Model of Intelligence

**W. Joel Schneider**  
**Kevin S. McGrew**





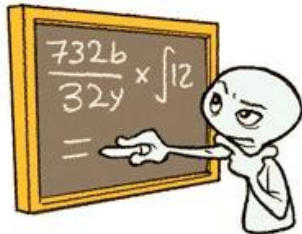
**John Horn**, compared the process of classifying and categorizing human abilities and intelligence to “**slicing smoke**”. (Horn, 1991)





Contemporary  
psychometric  
research has  
converged on the  
**Cattell-Horn-Carroll  
(CHC) model** of  
cognitive abilities as  
the **consensus  
working taxonomy**  
of human  
intelligence

QUANTITATIVE KNOWLEDGE (GQ):



DEPTH AND BREADTH OF KNOWLEDGE RELATED TO MATHEMATICS.

READING + WRITING (GRW):



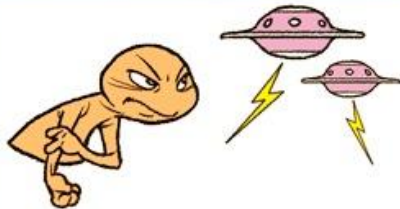
DEPTH AND BREADTH OF KNOWLEDGE AND SKILLS RELATED TO WRITTEN LANGUAGE.

COMPREHENSION - KNOWLEDGE (GC):



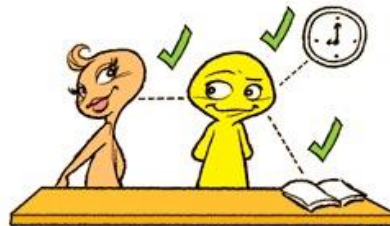
DEPTH AND BREADTH OF KNOWLEDGE AND SKILLS THAT ARE VALUED BY ONE'S CULTURE.

FLUID REASONING (GF):



THE DELIBERATE BUT FLEXIBLE CONTROL OF ATTENTION TO SOLVE NOVEL "ON THE SPOT" PROBLEMS THAT CANNOT BE PERFORMED BY RELYING EXCLUSIVELY ON PREVIOUSLY LEARNED HABITS, SCHEMAS, AND SCRIPTS.

SHORT-TERM MEMORY (GSM):



THE ABILITY TO ENCODE, MAINTAIN, AND MANIPULATE INFORMATION IN ONE'S IMMEDIATE AWARENESS.

LONG-TERM STORAGE + RETRIEVAL (GLR):



THE ABILITY TO STORE, CONSOLIDATE, AND RETRIEVE INFORMATION OVER PERIODS OF TIME MEASURED IN MINUTES, HOURS, DAYS, AND YEARS.

VISUAL PROCESSING (GV):



THE ABILITY TO MAKE USE OF SIMULATED MENTAL IMAGERY (OFTEN IN CONJUNCTION WITH CURRENTLY PERCEIVED IMAGES) TO SOLVE PROBLEMS.

AUDITORY PROCESSING (GA):



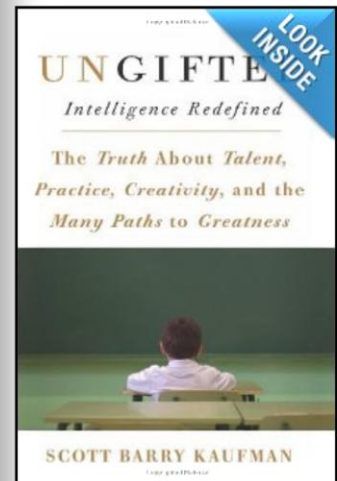
THE ABILITY TO DETECT AND PROCESS MEANINGFUL NONVERBAL INFORMATION IN SOUND.

PROCESSING SPEED (GS):

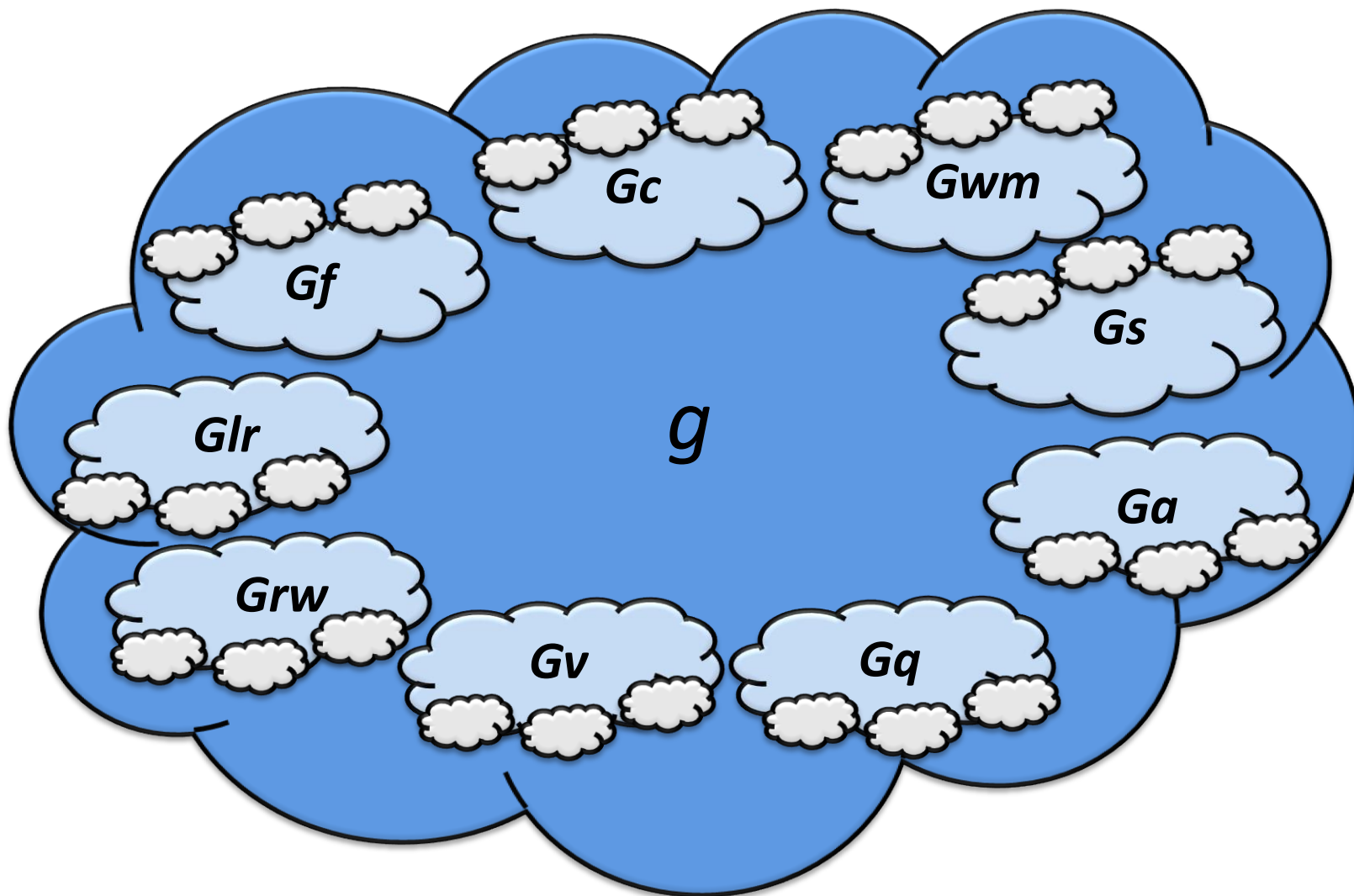


THE ABILITY TO PERFORM SIMPLE REPETITIVE COGNITIVE TASKS QUICKLY AND FLUENTLY.

From

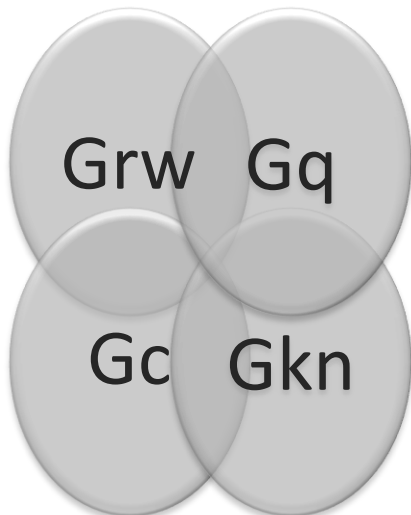




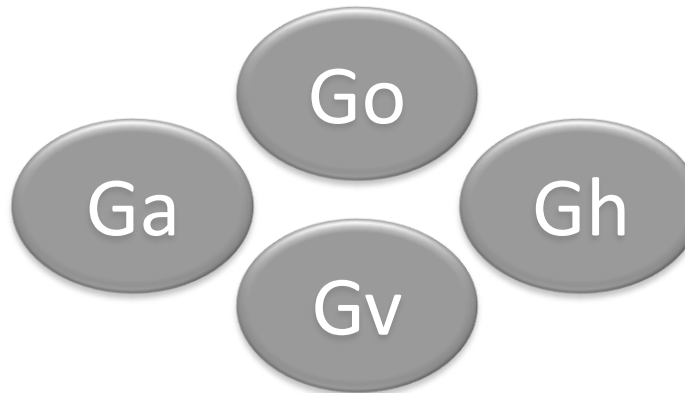


The CHC taxonomy of cognitive abilities:

**Current status**



Acquired Knowledge



Sensory

Sensory-Motor Domain-Specific Abilities



Motor

(From Schneider & McGrew, 2012)

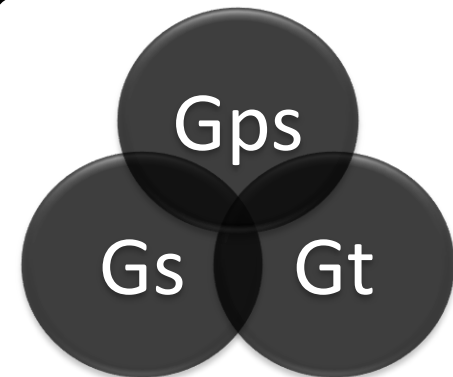


Conceptual Grouping

Functional Grouping



Memory



General Speed

Parameters of Cognitive Efficiency

Domain-Independent General Capacities

CHC model is analogous to the Periodic Table of Elements in Chemistry

# The Periodic Table

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1

H

hydrogen

1.007 94(7)

Atomic Number

Symbol

Name

Standard Atomic Weight

Metals

Non-metals

Alkali Metals

Alkali Earth Metals

Transition Metals

Lanthanoids

Actinoids

Metalloids

Halogens

Noble Gases

2	He	helium	4.002 602(2)
3	Li	lithium	6.941(2)
4	Be	beryllium	9.012 182(3)
5	B	boron	10.811(7)
6	C	carbon	12.0107(8)
7	N	nitrogen	14.0067(2)
8	O	oxygen	15.9994(3)
9	F	fluorine	18.998 4032(5)
10	Ne	neon	20.1797(6)
11	Na	sodium	22.989 769 28(2)
12	Mg	magnesium	24.3050(6)
13	Al	aluminium	26.981 538 6(8)
14	Si	silicon	28.855(3)
15	P	phosphorus	30.973 762(2)
16	S	sulfur	32.065(5)
17	Cl	chlorine	35.453(2)
18	Ar	argon	39.948(1)
19	K	potassium	39.0983(1)
20	Ca	calcium	40.078(4)
21	Sc	scandium	44.955 912(6)
22	Ti	titanium	47.867(1)
23	V	vanadium	50.9415(1)
24	Cr	chromium	51.9961(6)
25	Mn	manganese	54.938 045(5)
26	Fe	iron	55.845(2)
27	Co	cobalt	58.933 195(5)
28	Ni	nickel	58.6934(2)
29	Cu	copper	63.546(3)
30	Zn	zinc	65.409(4)
31	Ga	gallium	69.723(1)
32	Ge	germanium	72.64(1)
33	As	arsenic	74.921 60(2)
34	Se	selenium	78.96(3)
35	Br	bromine	79.904(1)
36	Kr	krypton	83.798(2)
37	Rb	rubidium	85.4678(3)
38	Sr	strontium	87.62(1)
39	Y	yttrium	88.905 85(2)
40	Zr	zirconium	91.224(2)
41	Nb	niobium	92.906 38(2)
42	Mo	molybdenum	95.94(2)
43	Tc	technetium	[98]
44	Ru	ruthenium	101.07(2)
45	Rh	rhodium	106.42(1)
46	Pd	palladium	106.42(1)
47	Ag	silver	107.8682(2)
48	Cd	cadmium	112.411(8)
49	In	indium	114.818(3)
50	Sn	tin	118.710(7)
51	Sb	antimony	121.760(1)
52	Te	tellurium	127.60(3)
53	I	iodine	126.904 47(3)
54	Xe	xenon	131.293(6)
55	Cs	caesium	132.905 451 9(2)
56	Ba	barium	137.327(7)
57-71	La-Lu	lanthanoids	
72	Hf	hafnium	178.49(2)
73	Ta	tantalum	180.947 88(2)
74	W	tungsten	183.84(1)
75	Re	rhenium	186.207(1)
76	Os	osmium	190.23(3)
77	Ir	iridium	192.217(3)
78	Pt	platinum	195.084(9)
79	Au	gold	196.966 569(4)
80	Hg	mercury	200.59(2)
81	Tl	thallium	204.3833(2)
82	Pb	lead	207.2(1)
83	Bi	bismuth	208.980 40(1)
84	Po	polonium	[209]
85	At	astatine	[210]
86	Rn	radon	[222]
87	Fr	francium	[223]
88	Ra	radium	[226]
89-103	Ac-Lr	actinoids	
104	Rf	rutherfordium	[261]
105	Db	dubnium	[262]
106	Sg	seaborgium	[266]
107	Bh	bohrium	[264]
108	Hs	hassium	[277]
109	Mt	meitnerium	[268]
110	Ds	darmstadtium	[271]
111	Rg	roentgenium	[272]
57	La	lanthanum	138.905 47(7)
58	Ce	cerium	140.116(1)
59	Pr	praseodymium	140.907 65(2)
60	Nd	neodymium	144.242(3)
61	Pm	promethium	[145]
62	Sm	samarium	150.36(2)
63	Eu	euprium	151.964(1)
64	Gd	gadolinium	157.25(3)
65	Tb	terbium	158.925 35(2)
66	Dy	dysprosium	162.500(1)
67	Ho	holmium	164.930 32(2)
68	Er	erbium	167.259(3)
69	Tm	thulium	168.934 21(2)
70	Yb	ytterbium	173.04(3)
71	Lu	lutetium	174.967(1)
89	Ac	actinium	[227]
90	Th	thorium	232.038 06(2)
91	Pa	protactinium	231.036 88(2)
92	U	uranium	238.028 91(3)
93	Np	neptunium	[237]
94	Pu	plutonium	[244]
95	Am	americium	[243]
96	Cm	curium	[247]
97	Bk	berkelium	[247]
98	Cf	californium	[251]
99	Es	einsteinium	[252]
100	Fm	fermium	[257]
101	Md	mendelevium	[258]
102	No	nobelium	[259]
103	Lr	lawrencium	[262]

lanthanoids

actinoids

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Source: International Union of Pure and Applied Chemistry



Domain-Independent Capacities

<i>Gf</i>	I	RG	RQ										
<i>Gwm</i>	WM	MS	AC										
<i>Glr</i>	MA	MM	M6	FI	FA	FE	SP	F0	NA	FW	LA	FF	FX
<i>Gs</i>	P	N	R9										
<i>Gt</i>	R1	R2	R4	R7	IT								
<i>Gps</i>	R3	PT	MT										

Ideas

Words

Figures

*Glr*-Learning efficiency

*Glr*-Retrieval fluency



Broad ability

Narrow ability



*Glr*-Learning efficiency

*Glr*-Retrieval fluency

Acquired Knowledge Systems

<i>Gc</i>	LD	VL	K0	LS	CM	MY			
<i>Gkn</i>	KL	K1	K2	A5	MK	KF	LP	BC	
<i>Grw</i>	V	RD	RC	RS	WA	SG	EU	WS	
<i>Gq</i>	KM	A3							

## The CHC Periodic Table of Human Abilities

Adapted from Schneider & McGrew (2012) and McGrew, LaForte and Schrank (2014)

Sensory-Motor Domain-Specific Abilities

<i>Gv</i>	Vz	SR	MV	CS	SS	CF	IM	PI	LE	IL	PN											
<i>Ga</i>	PC	US	UM	U8	UR	U1 U9	UP	UL														
<i>Gh</i>																						
<i>Go</i>	OM											<i>Gk</i>										
												<i>Gp</i>	PI	P2	P3	P4	P6	P7	A1			

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Sensory

Motor

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Domain-Independent Capacities	<i>Gf</i>	I	RG	RQ	Ideas					Words			Figures	
	<i>Gwm</i>	WM	MS	AC										
	<i>Glr</i>	MA	MM	M6	FI	FA	FE	SP	F0	NA	FW	LA	FF	FX
	<i>Gs</i>	P	N	R9										
	<i>Gt</i>	R1	R2	R4	R7	IT								
	<i>Gps</i>	R3	PT	MT										
Acquired Knowledge Systems	<i>Gc</i>	LD	VL	K0	LS	CM	MY							
	<i>Gkn</i>	KL	K1	K2	A5	MK	KF	LP	BC					
	<i>Gnw</i>	V	RD	RC	RS	WA	SG	EU	WS					
	<i>Gq</i>	KM	A3											
Sensory-Motor Domain-Specific Abilities	<i>Gv</i>	Vz	SR	MV	CS	SS	CF	IM	PI	LE	IL	PN		
	<i>Ga</i>	PC	US	UM	U8	UR	U1 U9	UP	UL					
	<i>Gh</i>	Sensory		<i>Gk</i>	Motor									
	<i>Go</i>	OM	<i>Gp</i>	PI	P2	P3	P4	P6	P7	A1				

Broad abilityNarrow ability

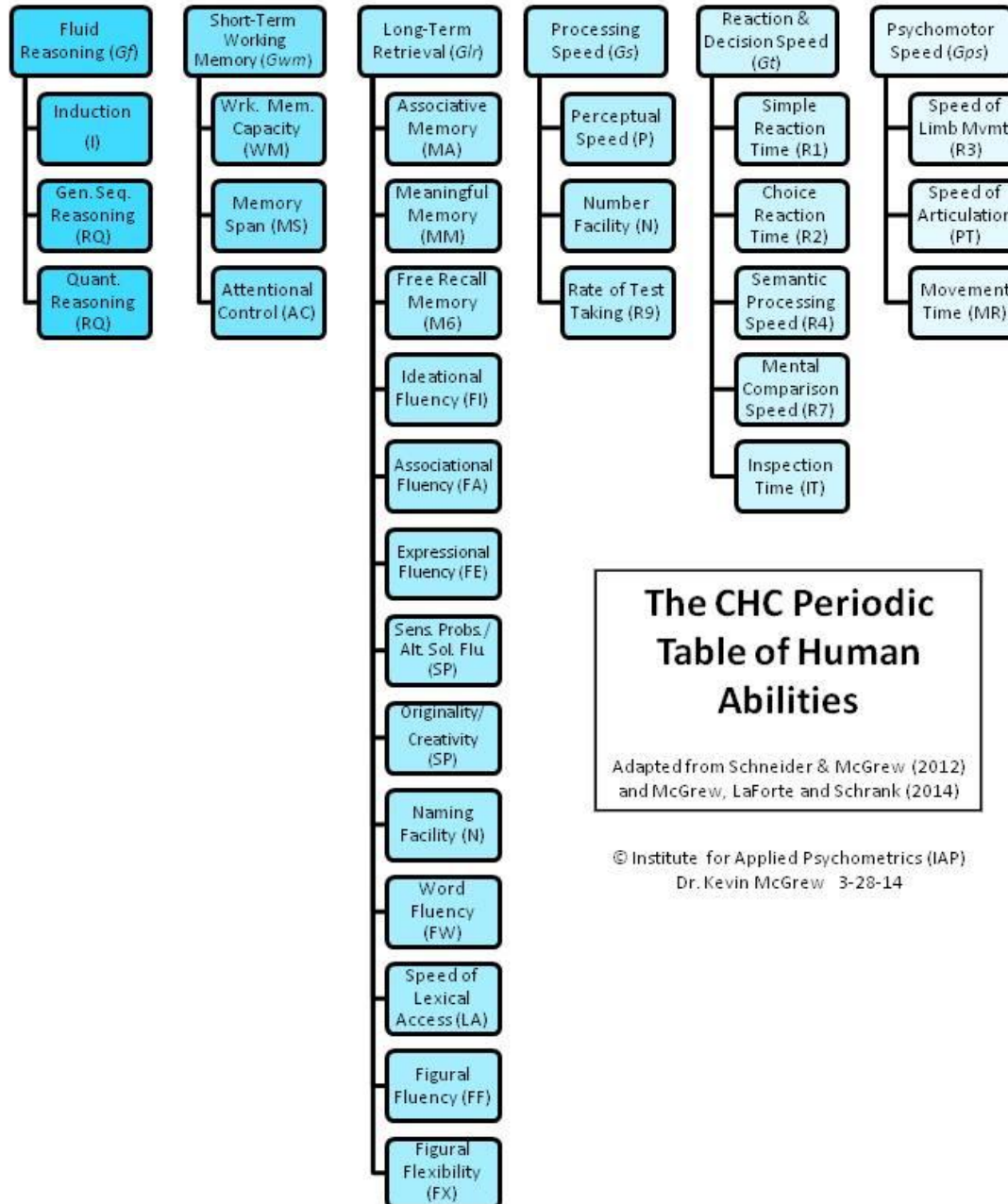
*Glr*-Learning efficiency*Glr*-Retrieval fluency

### The CHC Periodic Table of Human Abilities

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## CHC: Domain-Independent Capacities

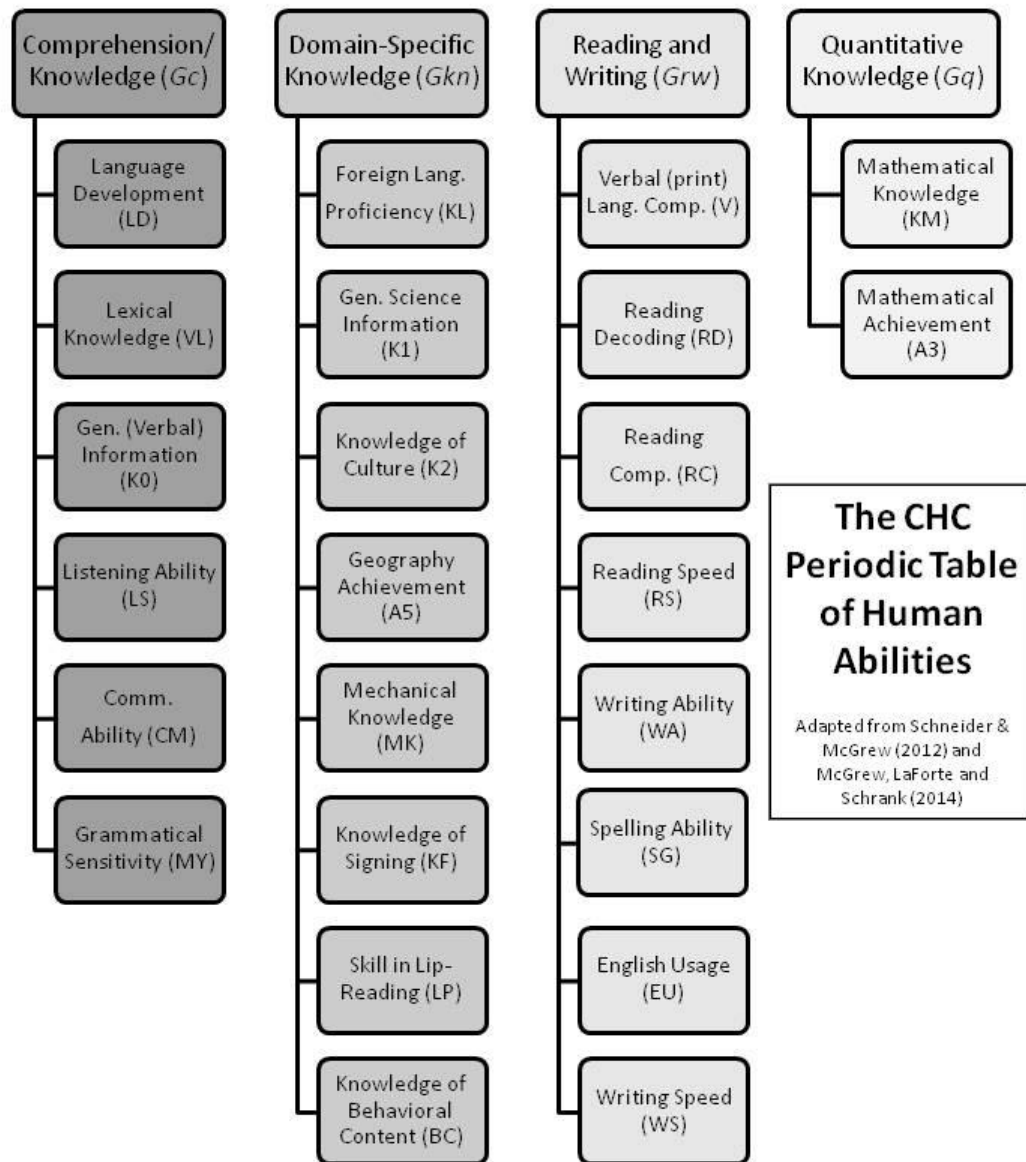


### The CHC Periodic Table of Human Abilities

Adapted from Schneider & McGrew (2012)  
and McGrew, LaForte and Schrank (2014)

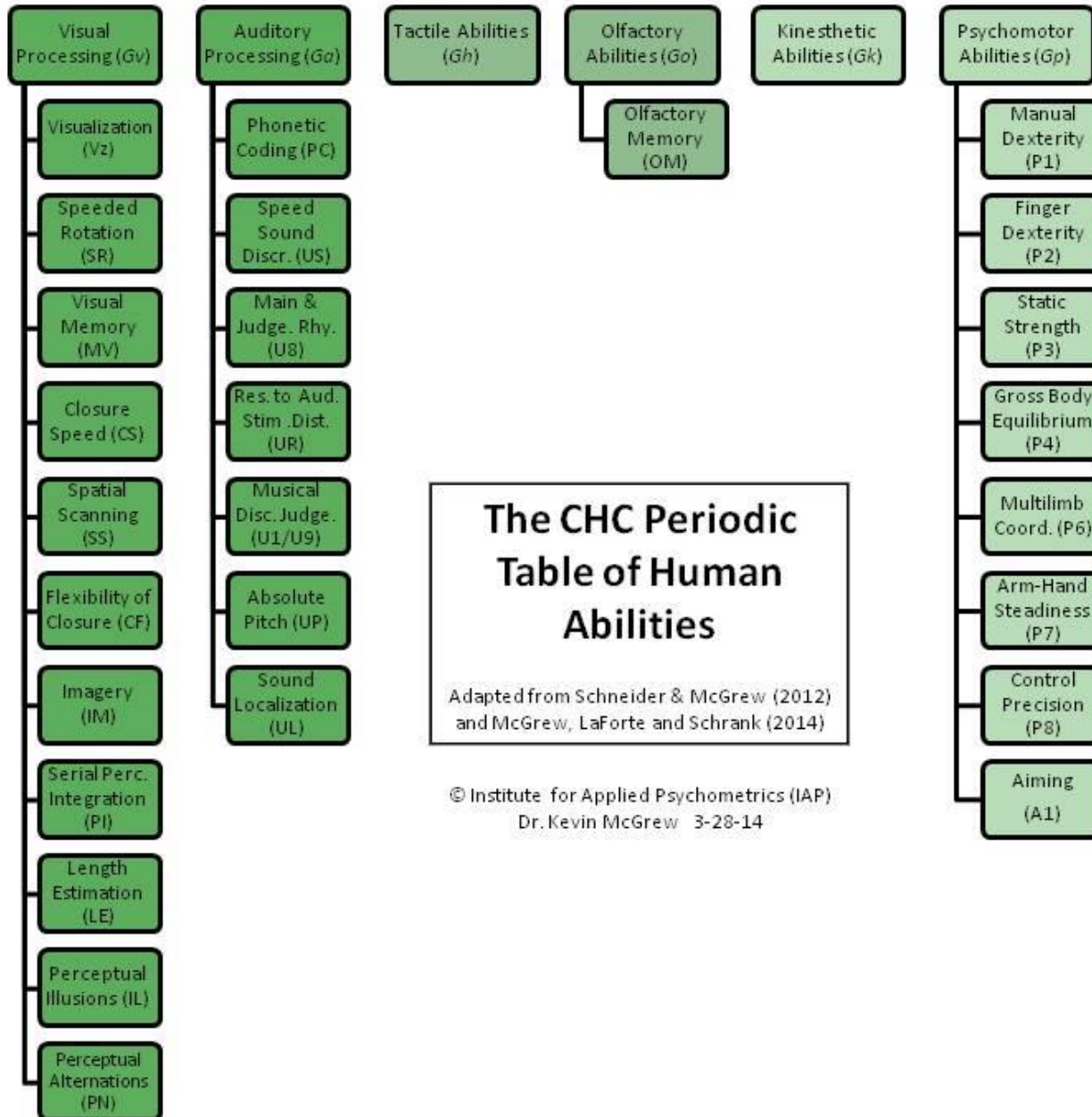
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## CHC: Acquired Knowledge Systems

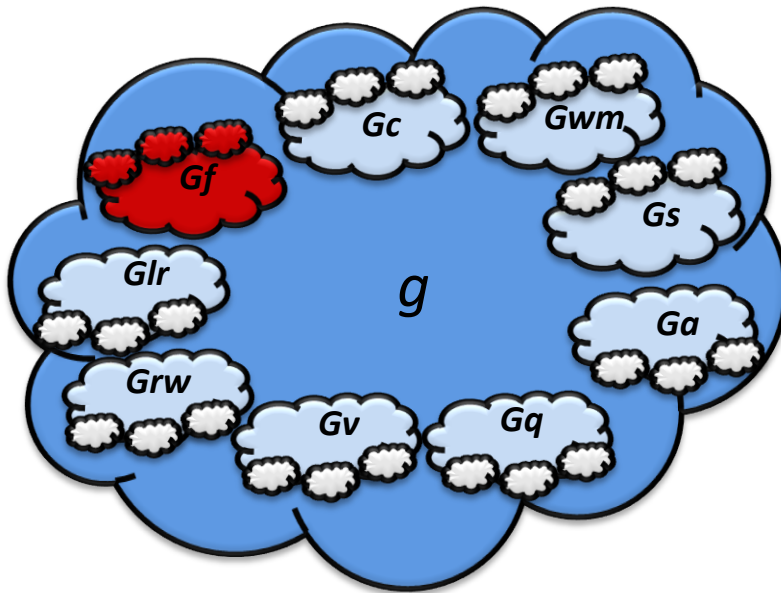




# Sensory-Motor Domain-Specific Abilities



# CHC Theory 101

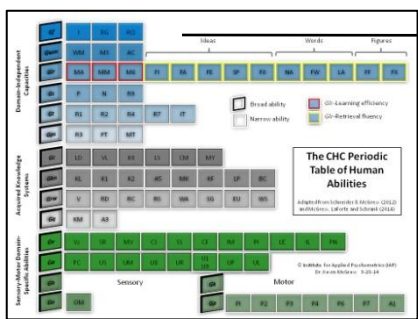


Defining and  
measuring **fluid**  
**reasoning (Gf)**

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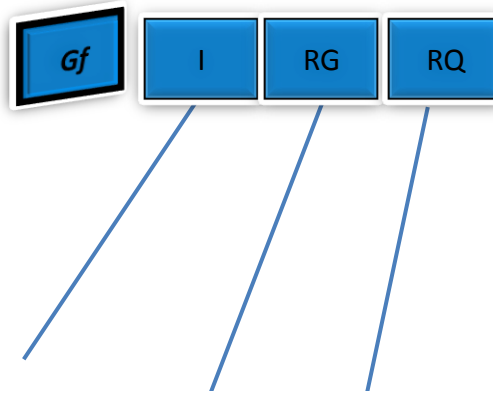
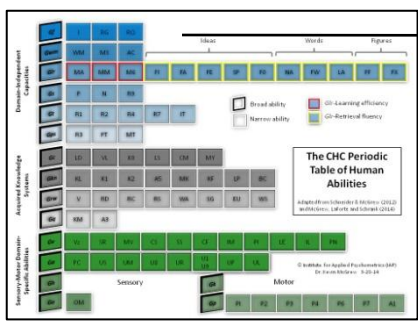
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## Fluid Reasoning (*Gf*): Definition & features

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

- Solving unfamiliar problems (novel problem solving).
- Most evident in abstract reasoning that depends less on prior learning.
- Deductive and inductive reasoning are primary characteristics.
- Inferential reasoning; concept formation; classification of unfamiliar stimuli; hypothesis generation and confirmation; identification of relevant similarities; the perception of relevant consequences of newly acquired knowledge; extrapolation of reasonable estimates in ambiguous situations.



**Fluid Reasoning (*Gf*):**  
Narrow abilities and  
definitions

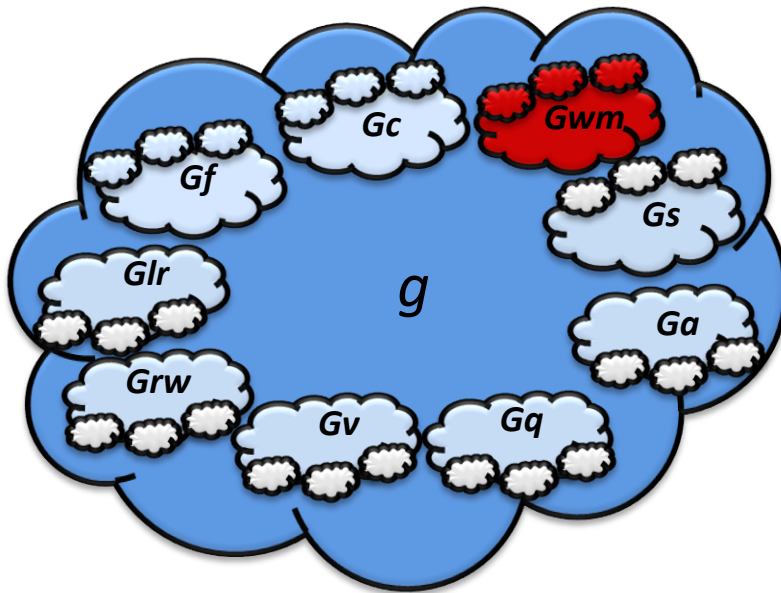
**Induction (I):** The ability to observe a phenomenon and discover the underlying principles or rules that determine its behavior.

**General Sequential Reasoning (RG):** The ability to reason logically using known premises and principles. This ability also is known as deductive reasoning or rule application.

**Quantitative Reasoning (RQ):** The ability to reason, either with induction or deduction, with numbers, mathematical relations, and operators.



# CHC Theory 101

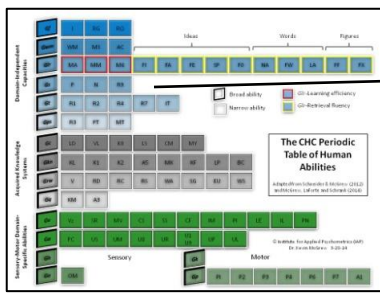


Defining and  
measuring  
**short-term  
working  
memory (*Gwm*)**

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**Gwm**

WM

MS

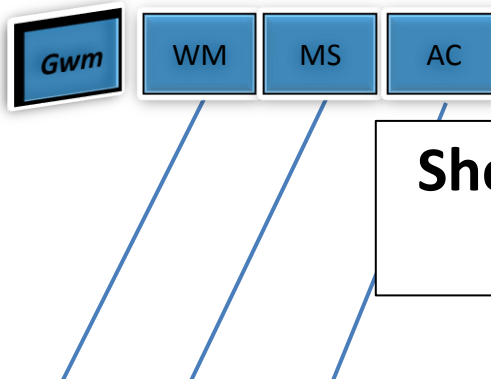
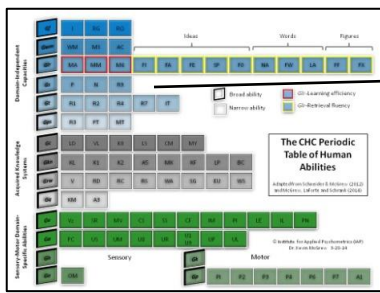
AC

## Short-term working memory (*Gwm*)

### Definition & features

***The ability to encode, maintain, and manipulate information in one's immediate awareness.***

- A limited capacity system.
- Loses information quickly through decay of memory traces, unless individual activates other cognitive resources to maintain the information in immediate awareness.



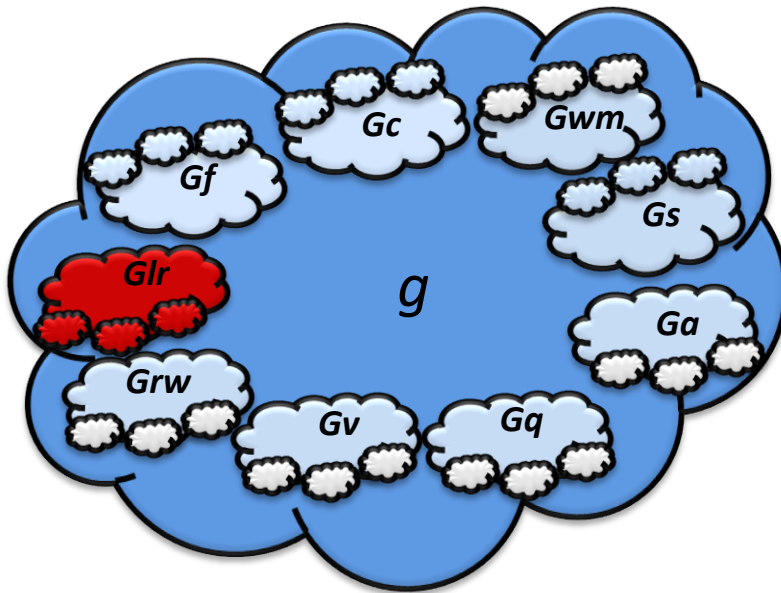
**Short-term working memory (*Gwm*)**  
narrow definitions

**Working Memory Capacity (WM):** The ability to direct the focus of attention to perform relatively simple manipulations, combinations, and transformations of information within primary memory while avoiding distracting stimuli and engaging in strategic/controlled searches for information in secondary memory.

**Memory Span (MS):** The ability to encode information, maintain it in primary memory, and immediately reproduce the information in the same sequence in which it was represented

**Attentional Control (AC):** The ability to focus on task-relevant stimuli and ignore task-irrelevant stimuli. The ability to regulate intentionality and direct cognitive processing. Sometimes referred to as spotlight or focal attention, focus, control of attention, executive controlled attention, or executive attention

# CHC Theory 101



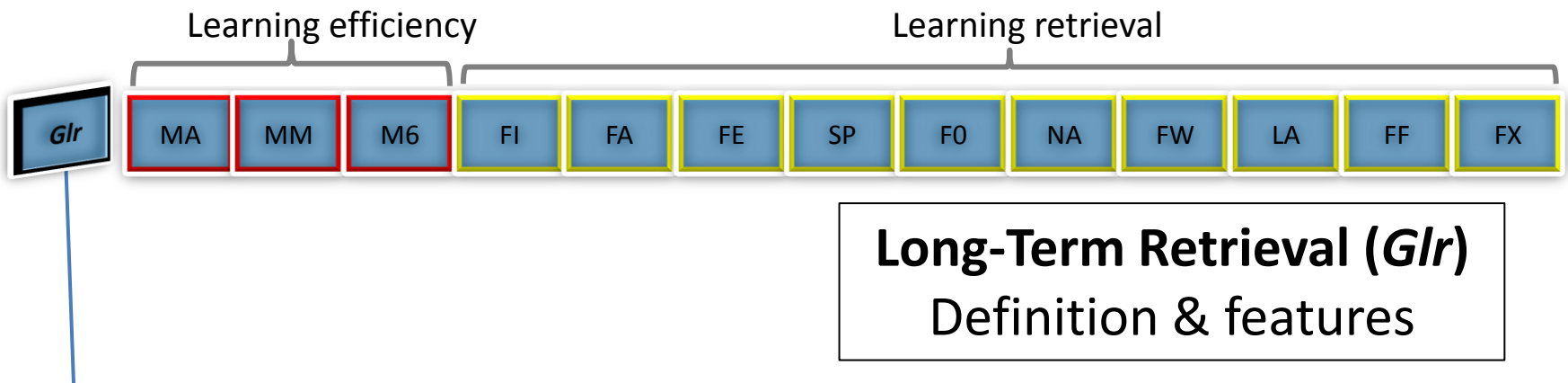
Defining and  
measuring long-  
term retrieval (*Glr*)

Dr. Kevin S. McGrew

Institute for Applied Psychometrics (IAP)

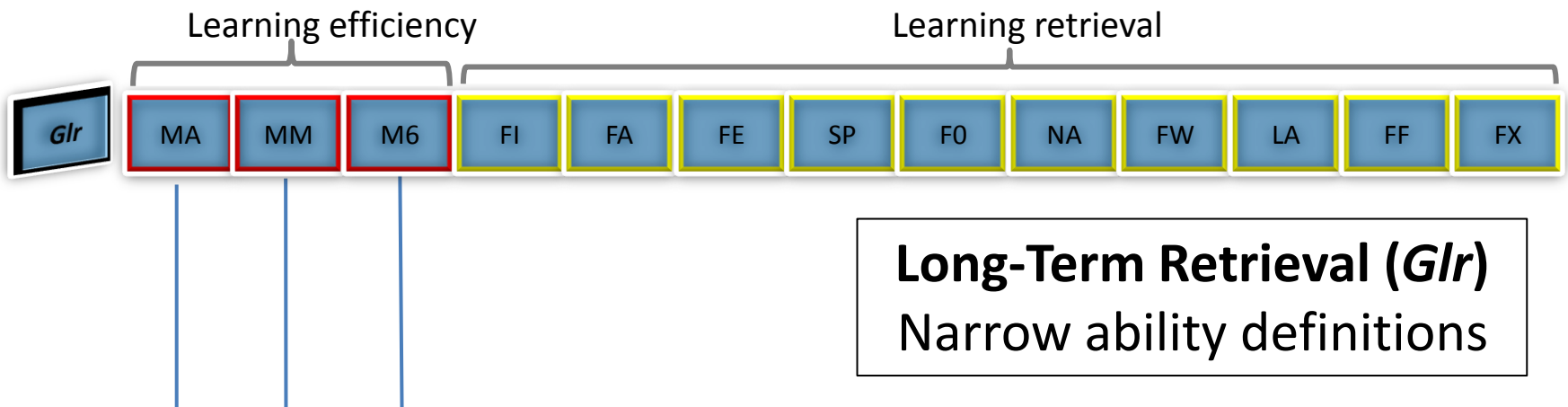
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***The ability to store, consolidate, and retrieve information over periods of time measured in minutes, hours, days, and years.***

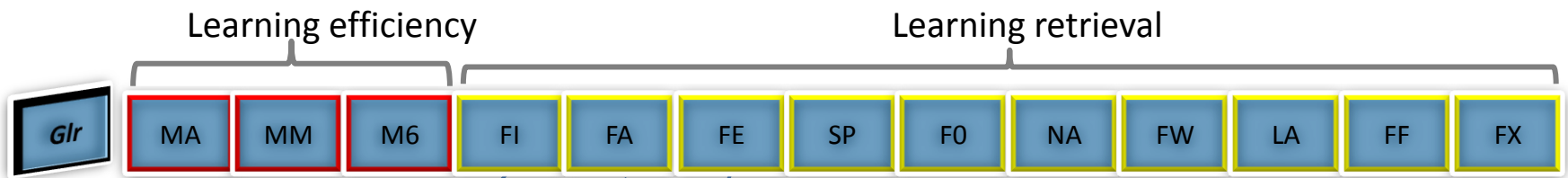
- A *Glr* test involves information that has been put out of immediate awareness long enough for the contents of primary memory to be displaced completely.
- Retrieving and recreating information from long-term memory.
- Learning efficiency abilities: Tasks where more information is presented than can be retained in *Gwm*.
- Learning retrieval fluency abilities: The rate and fluency at which individuals can access information stored in long-term memory



**Associative Memory (MA):** The ability to remember previously unrelated information as having been paired.

**Meaningful Memory (MM):** The ability to remember narratives and other forms of semantically related information.

**Free Recall Memory (M6):** The ability to recall lists in any order.



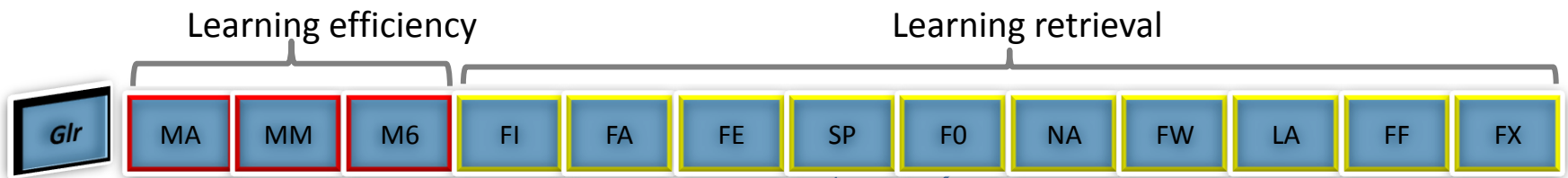
*Fluency abilities that involve the  
**production of ideas***

**Long-Term Retrieval (Glr)**  
Narrow ability definitions

**Ideational Fluency (FI):** The ability to rapidly produce a series of ideas, words, or phrases related to a specific condition or object. Quantity, not quality or response originality, is emphasized.

**Associational Fluency (FA):** The ability to rapidly produce a series of original or useful ideas related to a particular concept. In contrast to Ideational Fluency (FI), quality, rather quantity of production, is emphasized.

**Expressional Fluency (FE):** The ability to rapidly think of different ways of expressing an idea.



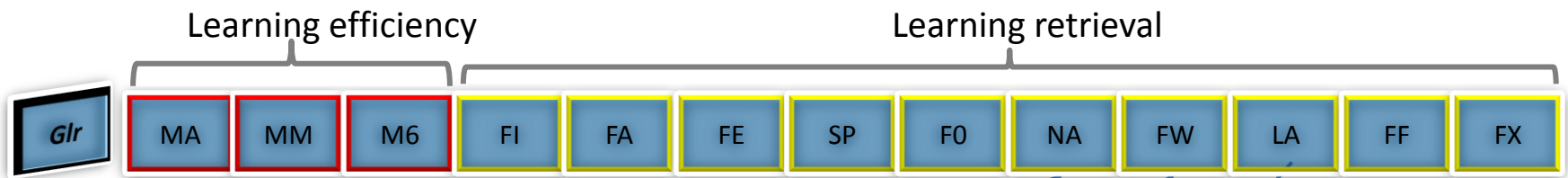
*Fluency abilities that involve the  
**production of ideas***

**Long-Term Retrieval (Glr)**  
Narrow ability definitions

**Sensitivity to Problems/Alternative Solution Fluency (SP):** The ability to rapidly think of a number of alternative solutions to a particular practical problem.

**Originality/Creativity (FO):** The ability to rapidly produce original, clever, and insightful responses (expressions, interpretations) to a given topic, situation, or task.





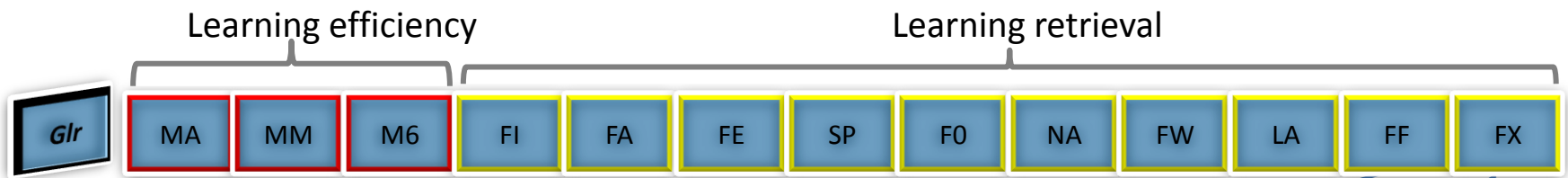
*Fluency abilities that involve the  
recall of words*

**Long-Term Retrieval (Glr)**  
Narrow ability definitions

**Naming Facility (NA):** The ability to rapidly call objects by their names. In contemporary reading research, this ability is called rapid automatic naming (RAN), or speed of lexical access.

**Word Fluency (FW):** The ability to rapidly produce words that share a phonological (e.g., fluency of retrieval of words via a phonological cue) or semantic feature (e.g., fluency of retrieval of words via a meaning-based representation). Also includes the ability to rapidly produce words that share nonsemantic features (e.g., fluency of retrieval of words starting with the letter T).

**Speed of Lexical Access (LA):** The ability to rapidly and fluently retrieve words from an individual's lexicon; verbal efficiency or automaticity of lexical access.



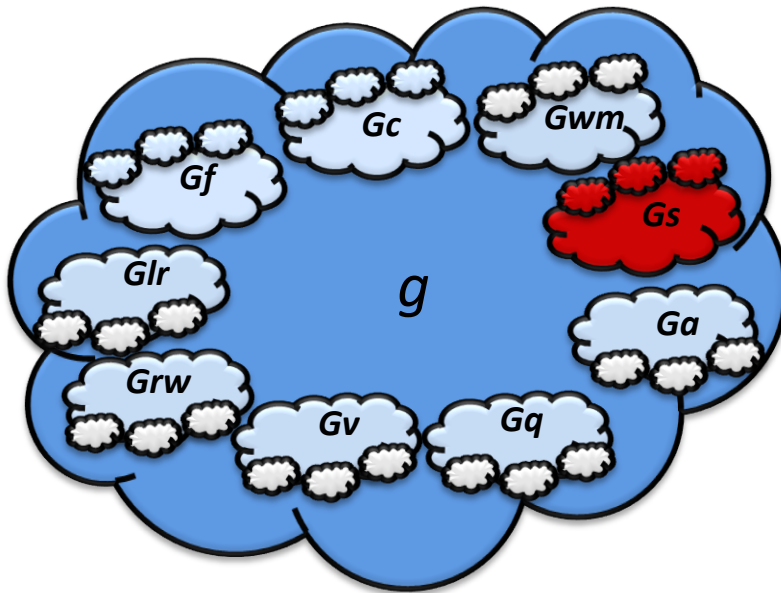
*Fluency abilities that involve **figures***

**Long-Term Retrieval (Glr)**  
Narrow ability definitions

**Figural Fluency (FF):** The ability to rapidly draw or sketch as many things (or elaborations) as possible when presented with a non-meaningful visual stimulus (e.g., set of unique visual elements). Quantity is emphasized over quality.

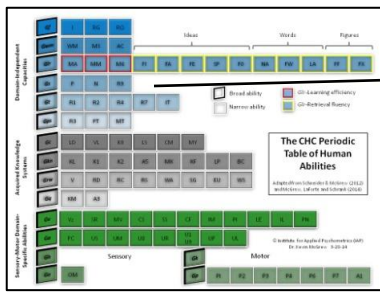
**Figural Flexibility (FX):** The ability to rapidly draw different solutions to figural problems.

# CHC Theory 101



Defining and  
measuring **processing  
speed (Gs)**

Dr. Kevin S. McGrew  
Institute for Applied Psychometrics (IAP)



Gs

P

N

R9

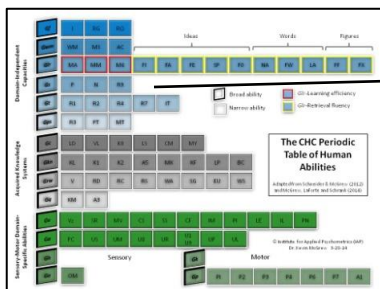
## Processing Speed (Gs) Definition & features

***The ability to perform both simple and complex repetitive cognitive tasks quickly and fluently.***

Automaticity.

Fluency of performing tasks.

Speed of executing relatively over-learned cognitive processes.



**Processing Speed (Gs)**  
Narrow ability definitions

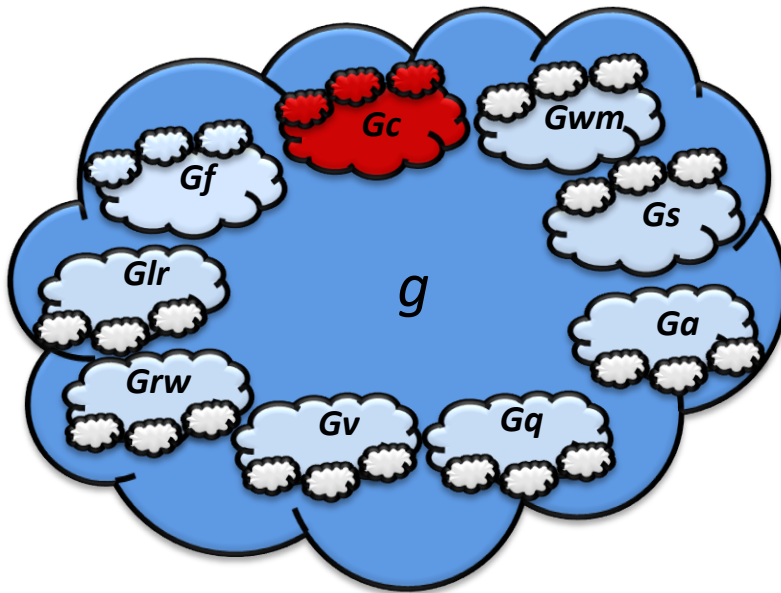
**Perceptual Speed (P):** The speed at which visual stimuli can be compared for similarities or differences.

**Number Facility (N):** The ability to manipulate numbers in working memory, and the speed of number pattern comparison. It includes the speed at which basic arithmetic operations are performed accurately.

**Rate-of-Test-Taking (R9):** The speed and fluency with which simple cognitive tests are completed. Through the lens of CHC theory, the definition of this factor has narrowed to simple tests that do not require visual comparison (P) or mental arithmetic (N).

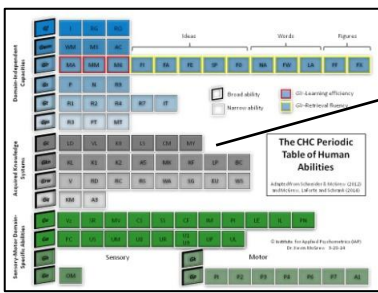


# CHC Theory 101



Defining and  
measuring  
comprehension-  
knowledge (*Gc*)

Dr. Kevin S. McGrew  
Institute for Applied Psychometrics (IAP)



**Gc**

LD

VL

KO

LS

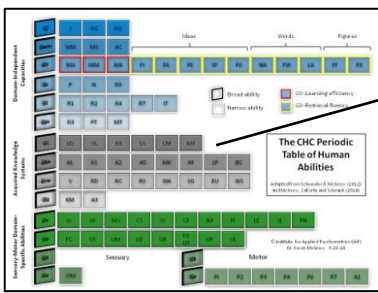
CM

MY

**Comprehension – Knowledge (*Gc*)**  
Definition & features

***The depth and breadth of knowledge and skills that are valued by one's culture.***

- Skills and knowledge valued in a culture.
- The degree to which a person has learned practically useful knowledge of language, information, and concepts specific to a culture.
- Store of verbal or language-based knowledge.



**Gc**

**LD**

**VL**

**K0**

**LS**

**CM**

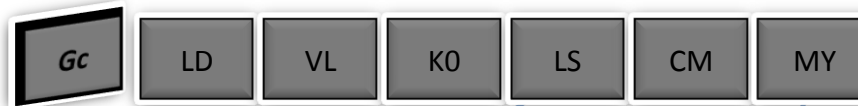
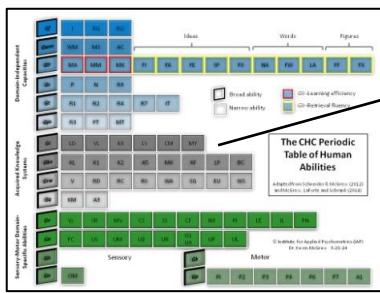
**MY**

**Comprehension – Knowledge (Gc)**  
Narrow ability definitions

**Language Development (LD):** The general understanding of spoken language at the level of words, idioms, and sentences. Language Development is at the core of *Gc*—understanding words in context.

**Lexical Knowledge (VL):** The knowledge of the definitions of words and the concepts that underlie them. Understanding the definitions of words in isolation. Vocabulary.

**General (Verbal) Information (K0):** The breadth and depth of knowledge that one's culture deems essential, practical, or otherwise worthwhile for everyone to know.



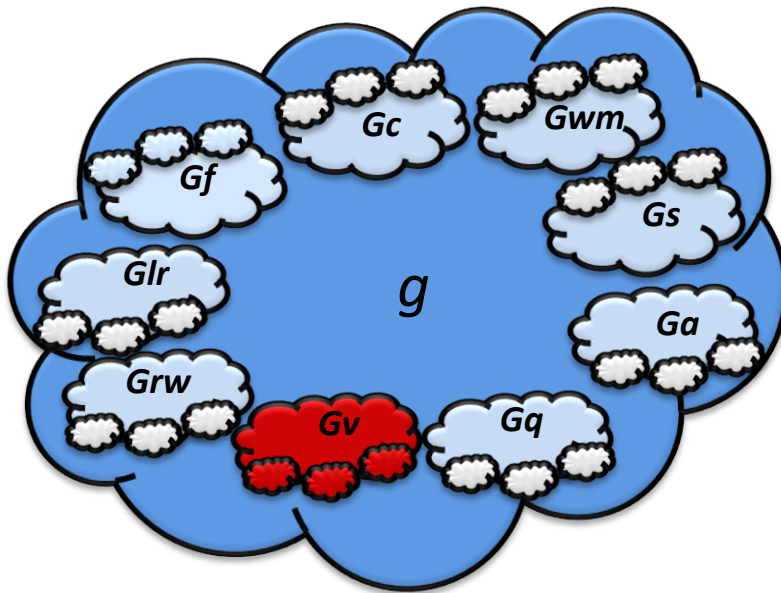
**Comprehension – Knowledge (*Gc*)**  
Narrow ability definitions

**Listening Ability (*LS*):** The ability to understand speech. Tests of listening ability typically have simple vocabulary but increasingly complex syntax or increasingly long speech samples to listen to.

**Communication Ability (*CM*):** The ability to use speech to communicate one's thoughts clearly. This ability is comparable to Listening Ability except that it is productive (expressive) rather than receptive.

**Grammatical Sensitivity (*MY*):** The awareness of the formal rules of grammar and morphology of words in speech.

# CHC Theory 101



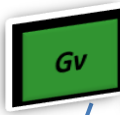
Defining and  
measuring **visual  
processing (Gv)**

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Institute for Applied Psychometrics (IAP)

The CHC Periodic Table of Human Abilities

Adapted from Schermer & McGrew (2012)  
with revisions: Catlett and Schermer (2016)

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for Kevin McGrew - 2016-06



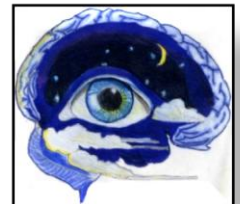
Vz	SR	MV	CS	SS	CF	IM	PI	LE	IL	PN
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## Visual Processing (Gv)

### Definition & features

***The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems.***

- Ability to generate, retain, retrieve, and transform well-structured visual images
- The ability to perceive and transform visual shapes, forms, or images
- The ability to maintain spatial orientation with regard to objects that may change or move through space
- Processing visual shapes or images “in the minds eye”





The CHC Periodic Table of Human Abilities

Adapted from Schmitt & McGrew (2012)  
 and McGrew, Loh, and Schmitt (2012)

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 Dr. Kevin McGrew - 2014



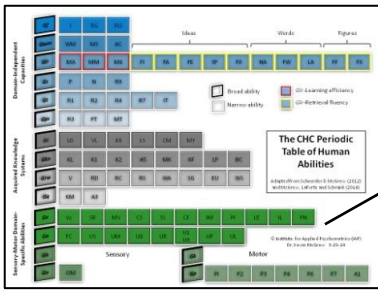
## Visual Processing (*Gv*)

### Narrow ability definitions

**Visualization (*Vz*):** The ability to perceive complex patterns and mentally simulate how they might look when transformed (e.g., rotated, changed in size, partially obscured, and so forth). *Vz* is the core ability of *Gv*.

**Speeded Rotation (Spatial Relations; *SR*):** The ability to solve visual problems quickly using mental rotation of simple images. The speed at which mental rotation tasks is completed is what is different from *Vz*.

**Visual Memory (*MV*):** The ability to remember complex images over short periods of time (less than 30 seconds). The tasks that define this factor involve being shown complex images and then identifying them soon after then stimulus is removed.



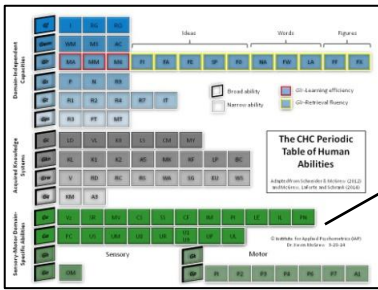
## Visual Processing (*Gv*)

### Narrow ability definitions

**Closure Speed (CS):** The ability to quickly identify a familiar, meaningful visual object from incomplete (e.g., vague, partially obscured, disconnected) visual stimuli without knowing in advance what the object is. This ability is sometimes called Gestalt Perception because it requires people to “fill in” unseen or missing parts of an image to visualize a single percept.

**Spatial Scanning (SS):** The ability to quickly and accurately survey (visually explore) a wide or complicated spatial field or pattern and to (a) identify a particular target configuration or (b) identify a path through the field to a determined end point. It is not clear whether this ability is related to complex large-scale real-world navigation skills.

**Flexibility of Closure (CF):** The ability to identify a visual figure or pattern embedded in a complex distracting or disguised visual pattern or array when the pattern is known in advance.



## Visual Processing (**Gv**)

### Narrow ability definitions

**Imagery (IM):** The ability to mentally imagine very vivid images

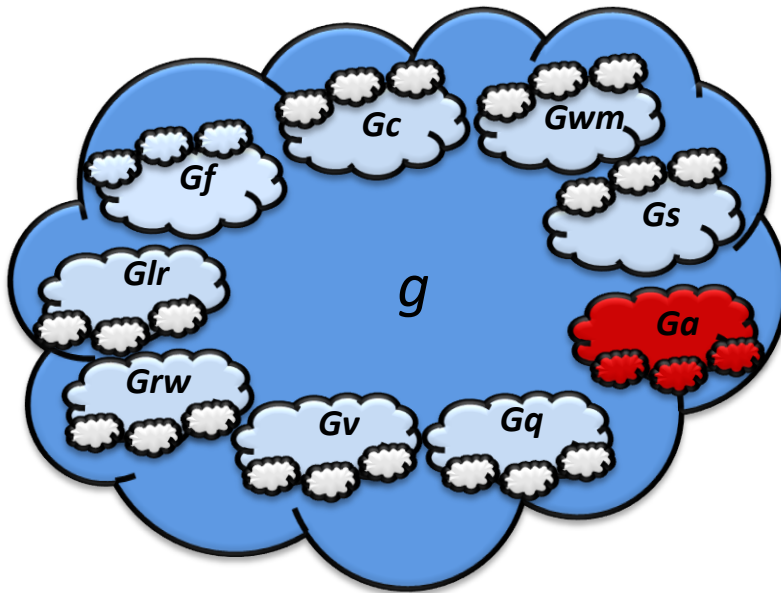
**Serial Perceptual Integration (PI):** The ability to recognize an object after only parts of it are shown in rapid succession.

**Length Estimation (LE):** The ability to visually estimate the length of objects.

**Perceptual Illusions (IL):** The ability to not be fooled by visual illusions.

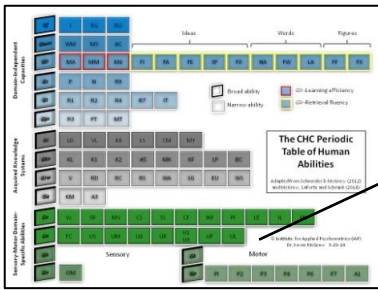
**Perceptual Alternations (PN):** Consistency in the rate of alternating between different visual perceptions.

# CHC Theory 101



Defining and  
measuring  
auditory  
processing (*Ga*)

Dr. Kevin S. McGrew  
Institute for Applied Psychometrics (IAP)



**Ga**

PC

US

UM

U8

UR

U1  
U9

UP

UL

## Auditory Processing (Ga) Definition & features

***The ability to detect and process meaningful nonverbal information in sound.***

- Abilities that depend on sound as input and on the functioning of our hearing apparatus.
- Key feature is the extent to which a person can cognitively “control” the perception of auditory information.
- Wide range of abilities in this domain:
  - Discriminating patterns in sounds and music
  - Processing sounds with distracting background noise
  - Analyze, manipulate, comprehend, and synthesize sound elements, groups of sounds, or sound patterns

The CHC Periodic Table of Human Abilities

Adapted from Schacter & McGrew (2012) and McGrew (2012)

Includes: Broad Abilities, Narrow Abilities, Specific Abilities

Legend: Broad ability (blue), Narrow ability (green), Specific ability (yellow)



## Auditory Processing (*Ga*)

### Narrow ability definitions

**Phonetic Coding (PC):** The ability to hear phonemes distinctly. This ability also is referred to as phonological processing and phonological awareness. People with poor phonetic coding have difficulty hearing the internal structure of sound in words.

**Speech Sound Discrimination (US):** The ability to detect and discriminate differences in speech sounds (other than phonemes) under conditions of little or no distraction or distortion. Poor speech sound discrimination can produce difficulty in the ability to distinguish variations in tone, timbre, and pitch in speech.

**Memory for Sound Patterns (UM):** The ability to retain (on a short-term basis) auditory codes such as tones, tonal patterns, or speech sounds .



The CHC Periodic Table of Human Abilities

Adapted from Schmitt & McGrew (2012) and McGrew (2012)

Includes: Broad ability, Narrow ability, Learning efficiency, and Developmental efficiency.



## Auditory Processing (*Ga*)

### Narrow ability definitions

**Maintaining and Judging Rhythm (U8):** The ability to recognize and maintain a musical beat.

**Resistance to Auditory Stimulus Distortion (UR):** The ability to hear words correctly even under conditions of distortion or loud background noise.

**Musical Discrimination and Judgment (U1 U9):** The ability to discriminate and judge tonal patterns in music with respect to melodic, harmonic, and expressive aspects (phrasing, tempo, harmonic complexity, intensity variations).