

# CHC THEORY



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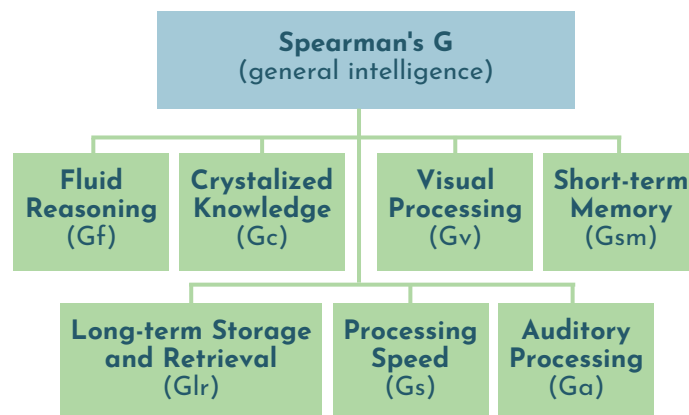
# THE CATTELL-HORN-CARROLL (CHC) THEORY

The Cattell-Horn-Carroll (CHC) model is the empirically based, valid, and measurable construct for the analysis of learning abilities. The Cattell-Horn-Carroll (CHC) Theory classifies cognitive skills within seven clusters of abilities that demonstrate moderate to highly significant correlations to academic achievement skills.

## THE SEVEN CHC AREAS:

**Overall Cognitive Ability**  
(e.g. full scale IQ)

**Broad CHC Abilities**  
(7 of relevance to academic achievement shown)



This guide can be used as a tool when consulting with special education teachers. This tool will help with explaining the CHC terms and helping educators connect psychoeducational assessment results to interventions and IEP recommendations.

If a student scores low in one of the seven CHC areas refer to the area in the guide for specific accommodations that can be applied in the educational setting and in the everyday sense.

# CRYSTALLIZED KNOWLEDGE

## Comprehension & Knowledge

### WHAT IS IT?

THE ABILITY TO  
COMPREHEND AND  
COMMUNICATE  
CULTURALLY VALUED  
KNOWLEDGE.

### ACCOMMODATIONS

#### RELATED TO INSTRUCTION

*Model critical thinking questions*

*Check in for understanding*

*Explicitly teach morphology to  
enhance the meaning of  
languages*

### WHAT ARE RELATED ABILITIES?

*Expression*

*Conceptualization*

*Language development*

*Lexical knowledge*

*Listening ability*

*Communication ability*

*General information*

*Grammatical sensitivity*

### ACCOMMODATIONS

#### RELATED TO VOCABULARY

*Associate new vocabulary words  
with a personal story or memory*

*Use familiar vocabulary words  
when introducing a new topic*

*Teach categorization for new  
concepts using webs and  
T-charts*

### WHAT ARE RELATED DIFFICULTIES?

*Learning new vocabulary*

*Understanding spoken and written  
language*

*Answering factual questions*

*Applying previous learning to new  
learning*

### ACCOMMODATIONS

#### TO USE IN DAILY LIFE

*Incorporate critical thinking  
questions in daily life and  
experiences*

*Encourage reading for leisure*

*Ask and think through how  
experiences and concepts are  
similar and different*

# FLUID REASONING

## Planning

### WHAT IS IT?

THE ABILITY TO SOLVE  
NOVEL PROBLEMS THAT  
DO NOT REQUIRE  
SPECIFIC LEARNED  
SCHEMAS OR HABITS.

### ACCOMMODATIONS

#### RELATED TO INSTRUCTION

*Teach categorization for new  
concepts - Where does this fit?*

*Practice forming hypotheses and  
drawing conclusions using  
available information*

*Model & practice problem-solving  
strategies*

### WHAT ARE RELATED ABILITIES?

*Conceptualization*

*Inductive reasoning*

*Quantitative reasoning*

### ACCOMMODATIONS

#### TO CONNECT THE DOTS

*Provide concrete examples*

*Use fact charts, manipulatives,  
and calculators*

*Link new learning to prior  
knowledge in an explicit way*

### WHAT ARE RELATED DIFFICULTIES?

*"Connecting the dots"*

*Generalizing learning to new experiences*

*Thinking of new and different ways to  
solve problems*

*Developing themes in writing*

*Recognizing relationships with numbers  
and math reasoning*

### ACCOMMODATIONS

#### TO USE IN DAILY LIFE

*Model and encourage cognitive  
flexibility*

*Embrace mistakes*

*Make predictions and draw  
conclusions in everyday life, and  
reflect on why predictions were  
(or were not) accurate*

# PROCESSING SPEED

## WHAT IS IT?

THE ABILITY TO CONTROL  
ATTENTION IN ORDER TO  
AUTOMATICALLY,  
QUICKLY, AND FLUENTLY  
PERFORM RELATIVELY  
SIMPLE COGNITIVE TASKS.

## ACCOMMODATIONS

### RELATED TO INSTRUCTION

*Give extra time to process  
directions and respond*

*Reduce note-taking requirements*

*Provide seating away from  
distractions*

## WHAT ARE RELATED ABILITIES?

*Perceptual speed*

*Psychomotor speed*

*Reaction & decision speed*

*Number facility*

*Reading fluency*

*Writing fluency*

*Rate-of-test-taking*

## ACCOMMODATIONS

### RELATED TO WORKLOAD

*Set a reasonable time to work on  
assignments and homework and  
discontinue after that time*

*Praise "think-time efforts" instead  
of work completion*

*Chunk assignments into smaller  
parts*

*Give extra time to complete tasks*

## WHAT ARE RELATED DIFFICULTIES?

*Taking information in quickly*

*Completing assignments quickly*

*Putting thoughts into words quickly*

*Reading comprehension struggles  
because of struggles in academic fluency*

## ACCOMMODATIONS

### TO USE IN DAILY LIFE

*Teach time-telling and use a visual  
timer to support self-awareness*

*Chunk projects into smaller pieces*

*When you ask a question or  
engage in conversation, wait  
patiently for responses and  
encourage thoughtful answers*

# SHORT-TERM MEMORY

Working Memory/Sequential

## WHAT IS IT?

THE BRAIN'S "MENTAL  
SCRATCH PAD"

THE ABILITY TO HOLD  
INFORMATION AND USE IT  
WITHIN A FEW SECONDS.

## ACCOMMODATIONS

### RELATED TO INSTRUCTION

*Break steps into parts  
first ... then ... after ... last*

*Give verbal and visual instructions*

*Check for understanding*

*Repeat instructions and directions*

## WHAT ARE RELATED ABILITIES?

*Auditory short-term storage*

*Attentional control*

*Visual short-term storage*

*Working memory capacity*

## ACCOMMODATIONS

### TO SUPPORT REMEMBERING

*Use checklists during multi-part  
assignments*

*Allow number lines and  
multiplication charts*

*Introduce songs or mnemonics  
(PEMDAS) to help remember  
information*

## WHAT ARE RELATED DIFFICULTIES?

*Remembering information long enough to  
do something with it*

*Remembering the sequence of information*

*Orally retelling what was read*

*Taking notes*

*Following oral directions*

## ACCOMMODATIONS

### TO USE IN DAILY LIFE

*Give short directions and then  
check for understanding*

*Encourage questions to clarify or  
recall information*

*Use visual reminders*

*Provide opportunities for extra  
practice*

# LONG-TERM RETRIEVAL

## Learning

### WHAT IS IT?

THE ABILITY TO STORE  
AND RETRIEVE  
INFORMATION FROM THE  
BRAIN'S LIBRARY IN  
ORDER TO USE IT WHEN  
APPLICABLE.

### ACCOMMODATIONS

#### RELATED TO INSTRUCTION

*Make information meaningful  
when you teach*

*Enrich lessons using multimodal  
teaching*

*Review previously taught  
information and gradually  
introduce new concepts*

### WHAT ARE RELATED ABILITIES?

*Association*

*Learning efficiency  
Associative memory  
Meaningful memory*

*Retrieval fluency  
Ideational fluency  
Expressional fluency  
Associational fluency  
Speed of lexical access  
Naming facility  
Word fluency  
Figural fluency*

### ACCOMMODATIONS

#### TO SUPPORT REMEMBERING

*Provide hard copy of notes*

*Review, rehearse, and practice to  
"overlearn" skills and concepts*

*Provide multiple choice rather  
than short answer / essay*

### WHAT ARE RELATED DIFFICULTIES?

*Linking ideas and concepts together to  
accurately store ideas categorically*

*Recalling facts and procedures*

*Interrupted thought processes in expressive  
language*

*Making connections during oral  
presentations*

### ACCOMMODATIONS

#### TO USE IN DAILY LIFE

*Model new ideas and concepts*

*Verbally review what you have  
already learned and practice  
skills together*

*Talk about how you are grouping  
information in your head - what  
is the link?*

# AUDITORY PROCESSING

## WHAT IS IT?

THE ABILITY TO  
DISCRIMINATE, REMEMBER,  
REASON, AND WORK WITH  
AUDITORY STIMULI.

-TONES  
-ENVIRONMENTAL  
SOUNDS -SPEECH UNITS

## ACCOMMODATIONS RELATED TO INSTRUCTION

*Speak clearly when teaching*

*Ask the student what parts they  
heard after giving instructions  
and then clarify as needed*

*Preview vocabulary words and  
point out words that sound alike*

*Explore sounds, words, language,  
& rhythms*

## WHAT ARE RELATED ABILITIES?

*Speech-sound discrimination*

*Figure-ground / Resistance to auditory  
stimulus distortion*

*Memory for sound patterns*

*Maintaining and judging rhythm*

*Sound localization*

*Absolute pitch*

*Listening ability*

## ACCOMMODATIONS FOR LISTENING & HEARING

*Seat away from loud, competing  
noises*

*Provide access to  
noise-dampening headphones*

*Read books aloud and  
encourage students to follow  
along*

## WHAT ARE RELATED DIFFICULTIES?

*Learning phonics skills*

*Sounding out words*

*Reading word problems*

*Spelling*

*Maintaining attention and remembering  
long oral directions*

*Learning new vocabulary*

## ACCOMMODATIONS TO USE IN DAILY LIFE

*Provide audiobooks*

*Read together, especially books  
that play with and manipulate  
letter sounds*

*Speak clearly and check to  
ensure understanding*



# PHONOLOGICAL PROCESSING

## WHAT IS IT?

THE ABILITY TO  
DISTINCTLY HEAR  
PHONEMES, ASSOCIATE  
LANGUAGE TO PHONEMES,  
BLEND SOUNDS INTO  
WORDS, AND SEGMENT  
WORDS INTO PARTS.

## ACCOMMODATIONS RELATED TO INSTRUCTION

*Provide phonics instruction*

*Practice sight-word reading*

*Use songs & mnemonics to help  
with sound-symbol awareness*

## WHAT ARE RELATED ABILITIES?

*Phonetic coding*

*Auditory short-term storage*

*Word fluency*

## ACCOMMODATIONS FOR READING

*Read books aloud and  
encourage students to follow  
along*

*Read books that play with  
sounds and use rhyming*

*Read assignments and test  
questions aloud when possible*

## WHAT ARE RELATED DIFFICULTIES?

*Learning phonics skills*

*Sounding out words when reading and  
spelling*

*Reading slowly and methodically*

## ACCOMMODATIONS TO USE IN DAILY LIFE

*Provide audio books*

*Read together, especially books  
that play with and manipulate  
letter sounds*

*Listen to music and talk about  
the sounds and rhythms you hear*

# LONG-TERM RETRIEVAL

Visual-Spatial Processing / Simultaneous Processing

## WHAT IS IT?

THE ABILITY TO MAKE USE  
OF MENTAL IMAGERY TO  
SOLVE PROBLEMS.

PERCEIVING,  
DISCRIMINATING,  
& MANIPULATING  
VISUAL INFORMATION  
IN YOUR MIND.

## ACCOMMODATIONS RELATED TO INSTRUCTION

*Provide models and explain them  
(such as number lines)*

*Explain visuals*

*Teach organizational skills*

*Review class schedule throughout  
the day using visual and oral cues*

*Teach handwriting*

## WHAT ARE RELATED ABILITIES?

*Visualization*

*Speeded rotation*

*Imagery*

*Closure speed*

*Visual memory*

*Spatial scanning*

*Figure ground*

*Perceptual speed*

## ACCOMMODATIONS TO BETTER ACCESS VISUALS

*Highlight or underline important  
information & overlay charts and  
graphs with labels*

*Provide graph paper for math  
calculations*

*Reduce amount of visual  
information on a page  
(more white space!)*

## WHAT ARE RELATED DIFFICULTIES?

*Interpreting maps, charts, and patterns*

*Understanding spatial characteristics  
(eg, height)*

*Learning spatial orientation (eg, left vs. right)*

*Orthographic coding (using visual features of  
letters to decode)*

*Aligning numbers during computation*

*Handwriting, in size and spacing of letters, and  
staying in margins and lines*

## ACCOMMODATIONS TO USE IN DAILY LIFE

*Limit visual distractors in work  
spaces*

*Give oral directions*

*Use language to help explain  
visual information as you  
encounter it in day-to-day life*

# SENSORIMOTOR ABILITIES

## Psychomotor Abilities

### WHAT IS IT?

THE ABILITY TO PERFORM PHYSICAL BODY MOTOR MOVEMENTS WITH PRECISION, COORDINATION, FLUIDITY, & STRENGTH.

### ACCOMMODATIONS

#### RELATED TO INSTRUCTION

*Reduce copying and note-taking*

*Teach cursive*

*Teach webs, T-charts, and other graphic organizers to help get thoughts on paper*

### WHAT ARE RELATED ABILITIES?

*Psychomotor speed*

*Reactions & decision speed*

*Manual dexterity*

*Static strength*

*Control precision*

### ACCOMMODATIONS FOR WRITING

*Allow speech-to-text for assignments*

*Provide and allow wide-ruled paper*

*Allow gel ink pens instead of pencils if preferred*

*Allow pencil grip trainers*

*Try slant boards when writing*

### WHAT ARE RELATED DIFFICULTIES?

*Integrating visual and auditory information*

*Writing information by hand*

*Completing fine motor tasks*

### ACCOMMODATIONS

#### TO USE IN DAILY LIFE

*Assist with finemotor tasks such as cutting, tracing, & gluing*

*Encourage use of physical therapy ball or therapy putty after writing tasks*

*Reduce paper-and-pencil demands*

# ATTENTION

## WHAT IS IT?

THE PROCESS OF  
MAINTAINING ALERTNESS  
TO INCOMING SENSORY  
STIMULI IN ORDER TO  
PROCESS IT.

## ACCOMMODATIONS

### RELATED TO INSTRUCTION

*Direct attention to important information*

*Give short, simple directions*

*Provide reminders for tasks*

*Seat away from distractions as much as possible*

## WHAT ARE RELATED ABILITIES?

*Focused attention*

*Sustained attention*

*Selective attention*

*Alternating / shifting attention*

*Divided attention*

## ACCOMMODATIONS

### FOR ENVIRONMENT

*Provide a quiet workplace*

*Use nonverbal signals to redirect attention*

*Minimize visual clutter on page (more white space)*

*Emphasize major points visually*

## WHAT ARE RELATED DIFFICULTIES?

*Having thoughts seemingly unrelated to conversations and topics*

*Being sidetracked easily by things in the environment*

*Making careless mistakes in work*

*Showing inconsistent performance*

*Getting tired easily*

## ACCOMMODATIONS

### TO USE IN DAILY LIFE

*Use a timer for tasks*

*Use checklists and calendars*

*Provide structured routines*

*Build in frequent opportunities for physical movement*