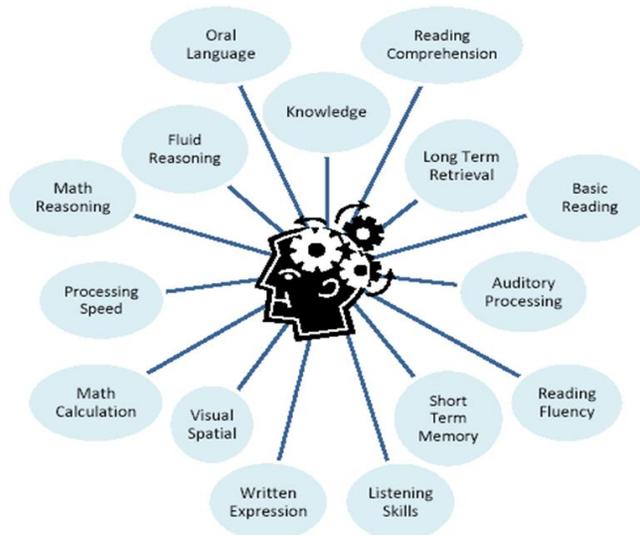


Cognitive Ability Factors:

“How They Influence Learning & Ways to Support Your Scholars”

Presenter: Dearly Ebony

**Cattell-Horn-Carroll Theory*



Researched Based Instructional Interventions & Accommodations

Modified Document Created by E. Mikle, Ed. Diag.

Source: C.M. Proctor, Ph.D. and G. Albright, M.S.

<i>Relationship to Academic Learning</i>	<i>Recommended Instructional Interventions</i>	<i>Recommended Accommodations</i>
<p>Comprehension Knowledge has a strong and consistent relationship to reading, writing, and math, such as learning vocabulary, answering factual questions, and comprehending oral/written language, all of which are highly predictive of academic success.</p>	<ul style="list-style-type: none">• Create a language and experience rich environment.• Relate new information to acquired knowledge.• Assess prior knowledge before introducing new topics or concepts.• Provide frequent exposure and practice to words.• Pre-teach relevant vocabulary/background information.• Develop word consciousness, the awareness of and interest in words and their meanings.• Provide explicit vocabulary instruction such as the meaning of common prefixes, suffixes, and root words.• Incorporate interests and prior knowledge experiences into instructional activities.• Provide clear and concise language when presenting concepts.• Check for understanding to ensure comprehension.	<ul style="list-style-type: none">• Provide resources to help students participate in class discussion.• Provide prompts to enhance written expression.• Provide preferential seating to enhance monitoring of comprehension.

<i>Relationship to Academic Learning</i>	<i>Recommended Instructional Interventions</i>	<i>Recommended Accommodations</i>
<p>Long-Term Retrieval has a significant relationship with reading and writing especially during early stages of skill acquisition, such as organizing for retrieval, strategies for recall, and learning and retrieving information.</p>	<ul style="list-style-type: none"> • Teach memory aids such as verbal mediation or rehearsal and mnemonic strategies. • Provide over-learning through review and repetition. • Provide a list of steps that will help organize learning behavior and facilitate recall. • Provide multisensory learning using visual, kinesthetic, vocal, and auditory channels. • Emphasize concept mastery understood instead of rote memory for rote information in grading rubrics. • Check to ensure that the student has retained sufficient information for independent work. • Provide immediate feedback. 	<ul style="list-style-type: none"> • Limit the amount of information to be learned during an instructional session. • Provide reference sheets, a calculator during math computation. • Use graphic organizers to reinforce associations between concepts.

<i>Relationship to Academic Learning</i>	<i>Recommended Instructional Interventions</i>	<i>Recommended Accommodations</i>
<p>Short-Term Working Memory has a significant relationship to reading, writing, and math (working memory in particular), such as attending/following directions, recalling sequences, memorizing actual information, listening and comprehending, and taking notes.</p>	<ul style="list-style-type: none"> • Teach strategies to increase understanding and retention of concepts such as self-talk and creating lists of procedures or steps. • Teach memory strategies such as chunking, verbal rehearsal, and visual imagery. • Gain the student’s attention before stating a direction. • Encourage asking for directions or information to be repeated if not understood or remembered. • Keep oral directions short and simple. • Have the student repeat or paraphrase directions. • Provide visual aids such as written directions for assignments. • Provide over-learning through review and repetition. • Check understanding of concepts through practice and talk-alouds. • Provide immediate feedback 	<ul style="list-style-type: none"> • Provide visual guides during oral presentations. • Provide lecture notes or arrange for peer-shared notes. • Provide a study guide to be completed during pauses in presentation. • Seat the student in a location away from distractions in order to optimize attention. • Provide extra time to copy information. • Read written directions aloud. • Use graphic organizers to reinforce associations between concepts

<i>Relationship to Academic Learning</i>	<i>Recommended Instructional Interventions</i>	<i>Recommended Accommodations</i>
<p>Fluid Reasoning has a significant relationship to higher level skills in reading, writing, and math, such as problem solving, drawing inferences, mental flexibility, transferring and generalizing, and thinking conceptually.</p>	<ul style="list-style-type: none"> • Teach problem-solving techniques in the contexts in which they are most likely to be applied. • Provide over-learning through repetition and multiple review of concepts. • Use concrete objects and manipulatives to develop conceptual understanding. • Use metacognitive skills, such as reflective discussions, thought journals, and self-questioning techniques. • Use think-alouds, guided practice, and feedback. • Use multiple and complex systems of retrieval and integration, such as compare, classify, abstract, induce, deduct, analyze perspectives. • Monitor for understanding. 	<ul style="list-style-type: none"> • Provide assistance in a timely manner. • Provide assistance with functions throughout a task such as when there are changes in task demands. • Seat the student next to a peer helper who can provide assistance. • Use graphic organizers to analyze relationships, such as cause and effect, compare and contrast, classification schemes, and sequential order

<i>Relationship to Academic Learning</i>	<i>Recommended Instructional Interventions</i>	<i>Recommended Accommodations</i>
<p>Auditory Processing has a significant relationship to reading and writing, especially during early stages of skill acquisition, such as acquiring phonics, sequencing sounds, listening, learning foreign language, and musical skills.</p>	<ul style="list-style-type: none"> • Provide direct explicit, systematic instruction. • Provide phonological awareness activities such as rhyming, alliteration, imitation, songs. • Provide explicit, instructions in sound discrimination, blending, and segmentation. • Emphasize sound-symbol associations when teaching decoding and spelling. • Provide visual aids, such as notes or study guides for listening activities. • Provide assistance with note taking. • Accompany oral information with visual materials. • Check for comprehension after directions are give. 	<ul style="list-style-type: none"> • Provide a well-managed classroom with control of extraneous activities that create auditory distractions and competing background noise. • Provide a peer assistant or buddy to assist with information when the student does not understand an oral communication. • Provide preferential seating that supports monitoring of student comprehension.
<p>Processing Speed has a significant relationship to reading, writing, and math especially during early stages of learning, such as completing assignments on time, processing information quickly, taking timed tests, and copying from the board.</p>	<ul style="list-style-type: none"> • Provide oral discussions. • Provide activities to increase rate and fluency, such as flash cards or speed drills through educational software. • Provide strategies that improve the rate of task completion. • Encourage the student to self-monitor progress, such as graph for reading fluency, writing fluency, and math computation fluency. 	<ul style="list-style-type: none"> • Shorten directions. • Provide lecture outlines such as a formatted script of notes in which only key words need to be added. • Limit or structure copying activities • Consider individualizing test taking, such as small group. • Provide extra time to read the text. • Provide extra time for processing. • Provide extra time to complete assignments.

Relationship to Academic Learning	Recommended Instructional Interventions	Recommended Accommodations
<p>Visual Processing has some relationship to reading fluency and higher-level math, such as using patterns and designs, sensing spatial orientation and boundaries, and noting visual detail.</p>	<ul style="list-style-type: none"> • Provide multisensory learning using visual, kinesthetic, vocal, and auditory channels. • Use manipulatives during instruction. • Use language to describe visual forms of information as they are manipulated. • Provide copying, tracing, and drawing activities. • Provide verbal description of graphics and visually-based concepts. • Use color coding to illustrate steps 	<ul style="list-style-type: none"> • Provide spatial and sequential guides. • Provide visual markers to indicate starting location and organization. • Provide graphic organizers to organize information.

References

Dehn, M. J. (2006) *Essentials of processing assessment*. Hoboken, New Jersey: John Wiley & Sons, Inc.

United States Department of Education. (2004) Achievement links to cognitive processes. *SLD Assessment Resource Packet*. Retrieved from http://txeda.org/Conference_Lectures/Gs-Ach.pdf

Mather, N. & Wendling, B. J. (2005). Linking cognitive assessment results to academic interventions for students with learning disabilities. In Flanagan, D.P., Harrison, P. L. (Eds.). *Contemporary intellectual assessment: Theories, tests, and issues*. New York, NY: Guilford Press.

Flanagan, D. P., Ortiz, S. O., & Alfonso, V. C. (2013). *Essentials of cross-battery assessment third edition*. Hoboken, New Jersey: John Wiley & Sons, Inc.

Fletcher, J. M., Lyon, G. R., Fuchs, L. S., & Barnes, M. A. (2007). *Learning Disabilities: From Identification to Intervention*. New York, NY: Guilford Press.

Mather, N., & Jaffe, L.E. (2002). *Woodcock Johnson II: Reports, recommendations, and strategies*. New York, NY: John Wiley & Sons. Inc.

McGrew (2009) CHC theory and the human cognitive abilities project: Standing on the shoulders of the giants of psychometric intelligence research. *Intelligence: A multidisciplinary journal*. 37(1) pp. 1-10.

Welding, B. J., & Mather, N. (2009). *Essentials of evidenced-based academic interventions*. New York, NY: John Wylie & Sons, inc.