

Manifestations of CHC Ability Weaknesses and Empirically-based Recommendations and Interventions (Flanagan & Mascolo, 2012)

CHC Broad Cognitive Abilities/Neuropsychological Functions	Brief Definition ¹	General Manifestations of Cognitive/Neuropsychological Weakness	Specific Manifestations of the Cognitive/Neuropsychological Weakness	Recommendations/ Interventions
Executive Functioning	<p>•Executive functioning is often understood as two broadly conceptualized areas that are related to the brain's frontal lobes: cognitive control and behavioral/emotional control. The <i>cognitive</i> aspects of executive functioning includes concept generation (Gc/Glr); problem solving (Gf); attentional shifting (attention; Gs); planning; organizing; working memory (Gsm); and retrieval fluency (Glr). The <i>behavioral/emotional</i> aspects of executive functioning relate to the inhibitory controls of behavior (e.g., impulsivity, regulation of emotional tone, etc.). (see Miller, 2010; KIDS Inc.)</p>	<p>Difficulty with:</p> <ul style="list-style-type: none"> • learning new activities, generating concepts, and solving problems • identifying goals and setting goals • planning (e.g., begins project without necessary materials; does not allocate sufficient time to complete task) • sequencing (e.g., may skip steps in multi-step problems) • Prioritizing (e.g., not sure what's important when taking notes) • organization (e.g., loses important papers; fails to turn in completed work; creates unrealistic schedule) • Initiation (e.g., has difficulty getting started on tasks, assignments, etc.) • pace (e.g., often runs out of time on seatwork and exams; has difficulty completing homework due to unrealistic timeline) • shifting between activities flexibly; coping with unforeseen events • self-monitoring (e.g., doesn't check to insure that each step was completed; doesn't check work before submitting it) • emotional control (e.g., may exhibit inappropriate or over-reactive response to situations) <p><i>Example: were adapted from Leslie E. Packer, Ph.D. (2003; see also Packer and Pruitt's book, Challenging Kids, Challenged Teachers Woodbine Press, 2010)</i></p>	<p>Reading difficulties:</p> <ul style="list-style-type: none"> • sequencing; telling a story chronologically • prioritizing; extracting main idea and other important information • problem solving; drawing inferences from text <p>Math difficulties:</p> <ul style="list-style-type: none"> • sequencing; remembering order of operations • prioritizing; figuring out what is important when solving word problems • shifting; attending to math signs on a page <p>Writing difficulties:</p> <ul style="list-style-type: none"> • generating ideas to write about • sequencing a story • prioritizing main events in a story 	<ul style="list-style-type: none"> • Assist student in organizing work by explaining (verbally and in writing or through visuals) the steps necessary to complete a task • Use visual schedules and build in time throughout the day to review • Use graphic organizers • Set alarm (on watch or computer) to regulate timing of projects and tasks • Plan and structure transition times and shifts in activities • Break long assignments into smaller, mini-assignments and provide time frames for completing each • Organize work space and minimize clutter; do this on a daily or weekly basis. • Make a checklist for getting through assignments. For example, a student's checklist could include such items as: get out pencil and paper; put name on paper; put due date on paper; read directions; etc. <p><i>Examples adapted from LD Online: Copyright 2008 by the National Center for Learning Disabilities, Inc. All rights reserved.</i></p>

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Attention	<ul style="list-style-type: none"> • Attention is a complex and multifaceted construct used when an individual must focus on certain stimuli for information processing. In order to regulate thinking and to complete tasks of daily living such as schoolwork, it is necessary to be able to attend to both auditory and visual stimuli in the environment. Attention can be viewed as the foundation of all other higher-order processing. Attention can be divided into five subareas: selective/focused attention, shifting attention, divided attention, sustained attention, and attentional capacity (Miller) • It is important to identify the exact nature of the attentional problem(s) prior to selecting an intervention, teaching strategies, modifying the curriculum, or making accommodations 	<ul style="list-style-type: none"> • Easily distracted • Lacks attention to detail; makes careless mistakes • Difficulty discerning demands of a task (e.g., where to begin or how to get started) • May only be able to attend to task in short intervals • Difficulty changing activities • Difficulty applying a different strategy when task demands change • Difficulty attending to more than one thing or task at a time • Cannot perform well with faced with multiple stimuli or an abundance of detail 	<p>Reading Difficulties:</p> <ul style="list-style-type: none"> • Loses one's place easily • Easily distracted while reading • Does not pick up important details in text <p>Math Difficulties:</p> <ul style="list-style-type: none"> • Does not consistently attend to math signs • Frequent mistakes on word problems <p>Writing Difficulties:</p> <ul style="list-style-type: none"> • Has difficulty completing long assignments; difficulty following time lines 	<ul style="list-style-type: none"> • Provide a quiet place to work in the classroom during seatwork • Provide reinforcement for timely completion of work • Make sure student understands oral directions and has the same directions in written form for reference • Provide a cue when transitioning • Work with student to develop a time line for longer assignments • Allow student to use a computer or dictate longer assignments • Assist student in proofing math and writing assignments • Reduce amount of repetitive seatwork • Build in breaks during longer assignments • Provide structure and highlight critical information in all academic tasks • Provide student with a monitor with whom he or she can check in with once or twice a day (e.g., keeping track of assignments, books, schedule)

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Short-Term Memory (Gsm)	<ul style="list-style-type: none"> •Ability to hold information in immediate awareness and use or transform it within a few seconds 	<p><i>Difficulties with:</i></p> <ul style="list-style-type: none"> •Following multi-step oral and written instructions •Remembering information long enough to apply it •Remembering the sequence of information •Rote memorization •Maintaining one's place in a math problem or train of thought while writing 	<p><i>Reading Difficulties:</i></p> <ul style="list-style-type: none"> •Reading comprehension (i.e., understanding what is read) •Decoding multisyllabic words •Orally retelling or paraphrasing what one has read <p><i>Math Difficulties:</i></p> <ul style="list-style-type: none"> •Rote memorization of facts •Remembering mathematical procedures •Multi-step problems and regrouping •Extracting information to be used in word problems <p><i>Writing Difficulties:</i></p> <ul style="list-style-type: none"> •Spelling multisyllabic words •Redundancy in writing (word and conceptual levels) •Identifying main idea of a story •Note taking 	<ul style="list-style-type: none"> •Use meaningful stimuli to assist with encoding and allow for experiential learning (i.e., learning while doing) •Provide opportunities for repeated practice and review •Provide supports (e.g., lecture notes, guided notes, study guides, written directions) to supplement oral instruction •Break down instructional steps for student •Provide visual support (e.g., times table) to support acquisition of basic math facts •Outline math procedures for student and provide procedural guides or flashcards for the student to use when approaching problems •Highlight important information within a word problem •Have student write all steps and show all work for math computations •Use writing programs or techniques that emphasize drafting first (e.g., Draft Builder 6) •Teach chunking strategies

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Processing Speed (Gs)	<ul style="list-style-type: none"> •Speed of processing, particularly when required to focus attention for 1-3 minutes •Usually measured by tasks that require the ability to perform simple repetitive cognitive tasks quickly and accurately •Narrow Gs abilities include Perceptual Speed, Rate-of-Test-Taking, Number Facility, Reading Speed, and Writing Speed (note that the latter two abilities are also listed under other broad CHC domains, including Grw) 	<p><i>Difficulties with:</i></p> <ul style="list-style-type: none"> •Efficient processing of information •Quickly perceiving relationships (similarities and differences between stimuli or information) •Working within time parameters •Completing simple, rote tasks quickly 	<p><i>Reading Difficulties:</i></p> <ul style="list-style-type: none"> •Slow reading speed, which interferes with comprehension •Need to reread for understanding <p><i>Math Difficulties:</i></p> <ul style="list-style-type: none"> •Automatic computations •Computational speed is slow despite accuracy •Slow speed can result in reduced accuracy due to memory decay <p><i>Writing Difficulties:</i></p> <ul style="list-style-type: none"> •Limited output due to time factors •Labored process results in reduced motivation to produce <p><i>Language Difficulties:</i></p> <ul style="list-style-type: none"> •Cannot retrieve information quickly – slow, disrupted speech; cannot get out thoughts quickly enough •Is slow to process incoming information, puts demands on memory store which can result in information overload and loss of meaning 	<ul style="list-style-type: none"> •Repeated practice •Speed drills •Online activities/games (e.g., http://www.arcademicskillbuilders.com/games/) •Computer activities that require quick, simple decisions •Extended time •Reducing the quantity of work required (including homework) •Increasing “wait” times both after questions are asked and after responses are given •Choral Repeated Reading •Books on tape

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Visual Processing (Gv)	<ul style="list-style-type: none"> •Ability to analyze and synthesize visual information •The ability to make use of simulated mental imagery (often in conjunction with currently perceived images) to solve problems (Schneider & McGrew, 2012) •There are many narrow Gv abilities, some of which include Visualization, Speeded Rotation, Closure Speed, Flexibility of Closure, Visual Memory and Spatial Scanning 	<p><i>Difficulties with:</i></p> <ul style="list-style-type: none"> •Recognizing patterns •Reading maps, graphs, charts •Attending to fine visual detail •Recalling visual information •Appreciation of spatial characteristics of objects (e.g., size, length) •Recognition of spatial orientation of objects 	<p><i>Reading Difficulties:</i></p> <ul style="list-style-type: none"> •Orthographic coding (using visual features of letters to decode) •Sight-word acquisition •Using charts and graphs within a text in conjunction with reading •Comprehension of text involving spatial concepts (e.g., social studies text describing physical boundaries, movement of troops along a specified route) <p><i>Math Difficulties:</i></p> <ul style="list-style-type: none"> •Number alignment during computations •Reading and interpreting graphs, tables, and charts <p><i>Writing Difficulties:</i></p> <ul style="list-style-type: none"> •Spelling sight words •Spatial planning during writing tasks (e.g., no attention to margins, words that overhang a line) •Inconsistent size, spacing, position, and slant of letters 	<ul style="list-style-type: none"> •Capitalize on students phonemic skills for decoding tasks. •Teach orthographic strategies for decoding (e.g., word length, shape of word); Use “cover, copy, compare” technique – go to: http://www.amblesideprimary.com/ambleside/lookcover/lookcover.html •Provide oral explanation for visual concepts. •Review spatial concepts and support comprehension through use of hands-on activities and manipulatives (e.g., using models to demonstrate the moon’s orbital path). •Highlight margins during writing tasks. •Provide direct handwriting practice. •Use graph paper to assist with number alignment.

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Long-Term Retrieval (Glr)	<ul style="list-style-type: none"> • Ability to store information (e.g., concepts, words, facts), consolidate it, and fluently retrieve it at a later time (e.g., minutes, hours, days, and years) through association • In Glr tasks, information leaves immediate awareness long enough for the contents of primary memory to be displaced completely. In other words, Glr tasks (unlike Gsm tasks) do not allow for information to be maintained continuously in primary memory (Schneider & McGrew, 2012) • Glr abilities may be categorized as either “learning efficiency” or “fluency”. Learning efficiency narrow abilities include Associative Memory, Meaningful Memory, and Free Recall Memory; fluency narrow abilities involve either the production of ideas (e.g., Ideational Fluency, Associational Fluency), the recall of words (e.g., Naming Facility, Word Fluency), or the generation of figures (e.g., Figural Fluency, Figural Flexibility) (Schneider & McGrew, 2012) 	<p>Difficulties with:</p> <ul style="list-style-type: none"> • Learning new concepts • Retrieving or recalling information by using association • Performing consistently across different task formats (e.g., recognition versus recall formats) • Rapid retrieval of information • Learning information quickly • Paired learning (visual-auditory) • Recalling specific information (words, facts) • Generating ideas rapidly 	<p>Reading Difficulties:</p> <ul style="list-style-type: none"> • Accessing background knowledge to support new learning while reading • Slow to access phonological representations during decoding • Retelling or paraphrasing what one has read <p>Math Difficulties:</p> <ul style="list-style-type: none"> • Memorizing math facts • Recalling math facts and procedures <p>Writing Difficulties:</p> <ul style="list-style-type: none"> • Accessing words to use during essay writing • Specific writing tasks (compare and contrast; persuasive writing) • Note-taking • Idea generation/production <p>Language Difficulties:</p> <ul style="list-style-type: none"> • Expressive – circumlocutions, speech fillers, “interrupted” thought, pauses • Receptive – making connections throughout oral presentations (e.g., class lecture) 	<ul style="list-style-type: none"> • Repeated practice with and review of newly presented information • Teach memory strategies (verbal rehearsal to support encoding, use of mnemonic devices) • Use multiple modalities when teaching new concepts (pair written with verbal information) • Limit the amount of new material to be learned; introduce new concepts gradually and with a lot of context • Be mindful of when new concepts are presented • Make associations between newly learned and prior information explicit • Use lists to facilitate recall (prompts) • Expand vocabulary to minimize impact of word retrieval deficits • Build in wait-time for student when fluency of retrieval is an issue • Use text previews to “prime” knowledge • Provide background knowledge first before asking a question to “prime” student for retrieval

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Auditory Processing (Ga)	<ul style="list-style-type: none"> •Ability to analyze and synthesize auditory information •One narrow aspect of Ga is a precursor to oral language comprehension (i.e., parsing speech sounds or Phonetic Coding) •In addition to Phonetic Coding, other narrow Ga abilities include, Speech Sound Discrimination, Resistance to Auditory Stimulus Distortion, Memory for Sound Patterns, (and others related to music) 	<p>Difficulties with:</p> <ul style="list-style-type: none"> •Hearing information presented orally, initially processing oral information •Paying attention especially in the presence of background noise •Discerning the direction from which auditory information is coming •Discriminating between simple sounds •Foreign language acquisition 	<p>Reading Difficulties:</p> <ul style="list-style-type: none"> •Acquiring phonics skills •Sounding out words •Using phonetic strategies <p>Math Difficulties:</p> <ul style="list-style-type: none"> •Reading word problems <p>Writing Difficulties:</p> <ul style="list-style-type: none"> •Spelling •Note taking •Poor quality of writing 	<ul style="list-style-type: none"> •Phonemic awareness activities •Emphasis on sight-word reading •Teach comprehension monitoring (e.g., does the word I heard/read make sense in context?) •Annunciating sounds in words in an emphatic manner when teaching new words for reading or spelling •Use work preview/text preview to clarify unknown words •Provide guided notes during note taking activities •Build in time for clarification questions related to “missed” or “misheard” items during lecture •Supplement oral instructions with written instructions •Shortening instructions •Preferential seating •Localizing sound source for student •Minimizing background noise

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Crystallized Intelligence (Gc)	<ul style="list-style-type: none"> •Breadth and depth of knowledge and skills that are valued by one's culture •Developed through formal education as well as general learning experiences •Stores of information and declarative and procedural knowledge •Reflects the degree to which a person has learned practically useful knowledge and mastered valued skills (Schnieder & McGrew, 2012) •Narrow Gc abilities include General Verbal Information, Language Development, Lexical Knowledge, Listening Ability, Information about Culture, Communication Ability, and Grammatical Sensitivity 	<p><i>Difficulties with:</i></p> <ul style="list-style-type: none"> •Vocabulary acquisition •Knowledge acquisition •Comprehending language or understanding what others are saying •Fact-based/informational questions •Using prior knowledge to support learning •Finding the right words to use/say 	<p><i>Reading Difficulties:</i></p> <ul style="list-style-type: none"> •Decoding (e.g., word student is attempting to decode is not in his/her vocabulary) •Comprehending (e.g., poor background knowledge about information contained in text) <p><i>Math Difficulties:</i></p> <ul style="list-style-type: none"> •Understanding math concepts and the "vocabulary of math" <p><i>Writing Difficulties:</i></p> <ul style="list-style-type: none"> •Grammar (syntax) •Bland writing with limited descriptors •Verbose writing with limited descriptors •Inappropriate word usage <p><i>Language Difficulties:</i></p> <ul style="list-style-type: none"> •Understanding class lessons •Expressive language – "poverty of thought" 	<ul style="list-style-type: none"> •Provide an environment rich in language and experiences •Frequent practice with and exposure to words •Read aloud to children •Vary reading purpose (leisure, information) •Work on vocabulary building •Teach morphology •Use text talks •Include supportive modalities (e.g., visuals, gestures) to increase understanding of language used •Embed instruction within a meaningful context (e.g., relating words to learner experiences, increasing listening ability through game-like format) •Use Vocabulary Cartoons (Burchers, 2000)

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Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Flanagan, Alfonso, & Mascolo, 2011, 2012)

Definitions of CHC Cognitive Abilities and Neuropsychological Functions, Manifestations of Cognitive Weaknesses and Examples of Recommendations and Interventions (Based on Flanagan, Alfonso, & Mascolo, 2012; *Contemporary Intellectual Assessment*, 3rd edition)

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Fluid Reasoning (G ₂)	<ul style="list-style-type: none"> • Novel reasoning and problem solving; ability to solve problems that are unfamiliar • Processes are minimally dependent on prior learning • Involves manipulating rules, abstracting, generalizing, and identifying logical relationships • Fluid reasoning is evident in inferential reasoning, concept formation, classification of unfamiliar stimuli, categorization, and extrapolation of reasonable estimates in ambiguous situations (Shneider & McGrew, 2012) • Narrow G_f abilities include Induction, General Sequential Reasoning (Deduction), and Quantitative Reasoning 	<p><i>Difficulties with:</i></p> <ul style="list-style-type: none"> • Higher level thinking and reasoning • Transferring or generalizing learning • Deriving solutions for novel problems • Extending knowledge through critical thinking • Perceiving and applying underlying rules or process(es) to solve problems 	<p><i>Reading Difficulties:</i></p> <ul style="list-style-type: none"> • Drawing inferences from text • Abstracting main idea(s) <p><i>Math Difficulties:</i></p> <ul style="list-style-type: none"> • Reasoning with quantitative information (word problems) • Internalizing procedures and processes used to solve problems • Apprehending relationships between numbers <p><i>Writing Difficulties:</i></p> <ul style="list-style-type: none"> • Essay writing and generalizing concepts • Developing a theme • Comparing and contrasting ideas 	<ul style="list-style-type: none"> • Develop student's skill in categorizing objects and drawing conclusions • Use demonstrations to externalize the reasoning process • Gradually offer guided practice (e.g., guided questions list) to promote internalization of procedures or process(es) • Targeted feedback • Cooperative learning • Reciprocal teaching • Use graphic organizers to arrange information in visual format • Teach metacognitive strategies (mnemonics that are <i>memorable</i> and that <i>accurately represent</i> the learning task) • Comparison of new concepts to previously learned concepts (same vs. different) • Use analogies, similes, metaphors when presenting tasks

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