Description of What Tasks and Tests Measure

Description of WAIS-IV  (Wechsler Adult Intelligence Tests, Fourth Edition) subtests:

**Similarities:** A verbal task that measures language conceptualization, verbal abstraction, and analogical verbal reasoning. Similarities examines the ability to think abstractly and to find similarities among words or ideas that may not appear to be similar on the surface. This task requires receptive language skills and a moderate demand on expressive language skills. There is no visual information presented or motor response required.

**Vocabulary:** Is a verbal test that measures word knowledge and the ability to verbally express definitions of words. The words are presented both visually (in large print) and orally to the student. This task requires minimal receptive and expressive vocabulary. The student must only understand that they need to provide a definition to the words presented. An appropriate “definition” can be a single word (synonym). No motor response required.

**Information:** Is a verbal task that measures acquired, culturally loaded knowledge. The questions on this task tend to tap information and experience learned through daily life and in the classroom. Questions involve widely known information about history, geography, science, literature, and practical real-world knowledge. There is no visual information or motor response required.

**Comprehension:** Is a supplementary subtest and a verbal task that measures understanding of social roles and practices and conventional standards of behavior. Comprehension questions tend to focus on “why we do things” or “how things work” in our society. This task requires receptive and expressive oral language skills. There is no visual information or motor response required.

**Block Design:** Is a visual and motor task that measures the ability to “see” geometric designs, analyze the visual information (design) presented, and recreate the design using six sided blocks. This is a timed task. This tasks places some demand on motor skills in order to manipulate the 1 inch cubes (blocks). The task requires the student to break down patterns into smaller “parts” and also to create larger patterns out of smaller “parts”. This task can also be a helpful demonstration of an individual’s approach to problem solving.

**Matrix Reasoning:** Is a task that is presented in a visual format and measures non-verbal abstract problem solving, inductive reasoning, and spatial reasoning ability. This task requires pattern recognition, attention to visual details including shape, color, pattern, and location, and recognition of the relationship between parts/details. Minimal demands are places on receptive language and no demands are placed on expressive language. The individual can simply point the correct answer. No fine motor coordination is required.

**Visual Puzzles:** Is a visual task that requires the individual to view a completed puzzle and select three response options that, when combined, reconstruct the puzzle, and do so within a specified time limit. This subtest is designed to measure nonverbal reasoning and the ability to analyze and synthesize visual stimuli as well the ability to anticipate relationships among parts. Performance on this task also may be influenced by visual perception, broad visual intelligence,
fluid intelligence, and simultaneous processing. The task requires the individual to “move or rotate shapes mentally” (spatial visualization and manipulation) and in order to solve problems. No motor output or expressive language skills are required.

**Digit Span**: A verbal/auditory task that measures short-term auditory memory and focus. The task requires the individual to immediately repeat series of numbers of increasingly length that are spoken by the examiner. The individual is required to repeat numbers in order (Forward), in reverse order (Backward), and from lowest to highest (Sequencing). The task measures how long an individual can pay attention to what they hear and “hold” the information in short-term memory long enough to immediately recite the information back or to perform a simple operation with the information (such as re-ordering the numbers). There is no visual information presented or motor response required.

**Arithmetic**: Is a verbal task that measures immediate memory and focus during a task that requires the ability to perform mathematical calculations. The examiner reads word problems and the individual is required to complete the calculation “in their head” without the use of paper and pencil. Arithmetic measures attention and memory, but also quick recall of math facts and functions and general proficiency with basic math calculations. There is no visual information or motor response required.

**Number-Letter Sequencing**: Is a supplementary verbal task that requires individuals to reorder a series of letters and numbers based on a set of specific rules (Letter-Number Sequencing). This task measures short-term memory, attention, and the ability to manipulate/reorder information in short term memory. This task places moderate demands on receptive language skills since the individual must understand the directions and “rules” of the task in order to complete it. There is no visual information or motor response required.

**Coding**: Is a visual, paper and pencil task that requires individuals to match numbers with symbols based on a “key” at the top of the page (Coding) by drawing the correct symbol in the boxes provided. Coding measures visual processing speed, short-term visual memory, and the ability to shift the eyes efficiently back and forth between the “key” and the responses. This task requires fine motor skills (using a pencil) but does not require expressive language. Minimal demands are placed on receptive language. This task also assesses the ability to sustain focus and effort for a two minutes.

**Symbol Search**: Is a visual, paper and pencil task that requires rapid visual scanning and discrimination (Symbol Search) and is a measure of the ability to rapidly process visual information and make a quick “decision.” Minor demands are placed on immediate visual memory. The task requires the individual to determine whether target symbols (simple line drawings) appear in line of various simple symbols. Symbol search places less demands on motor output and control since the response only requires a simple mark (such as a “slash”) and does not require hand writing per say. This task also assesses the ability to sustain focus and effort for two minutes.

**Verbal Comprehension Index (VCI)**:
This index reflects an individual’s ability to understand, use and think with spoken language. It also demonstrates the breadth and depth of knowledge acquired from one’s environment. It measures the retrieval from long-term memory of such information. The VCI measures vocabulary, verbal abstract thinking, verbal reasoning, verbal concept formation, verbal expression, and the application of acquired knowledge. It includes the following subtests: Similarities, Vocabulary, Information (and/or Comprehension).
**Perceptual Reasoning Index (PRI):**
This index reflects an individual’s ability to accurately interpret, organize and think with visual information. It measures nonverbal reasoning skills and taps into thinking that is more fluid and requires visual perceptual abilities. The PRI measures the ability to evaluate visual details, to understand visual spatial relationships, and to complete hand-on construction tasks from viewing a model. The ability to construct designs requires visual spatial reasoning, integration, and synthesis of part-whole relationships, attentiveness to visual detail, and visual-motor integration. Tasks in this domain also measure inductive and quantitative reasoning, broad visual intelligence, simultaneous processing, and non-verbal abstract thinking. The PRI includes the following subtests: Block Design, Matrix Reasoning, and Visual Puzzles.

**The Working Memory Index (WMI):**
The WMI measures the ability to register, maintain, and manipulate auditory information in consciousness awareness. Registration requires attention, auditory and visual discrimination, and concentration. Maintenance is the process by which information is kept active in conscious awareness, using the phonological loop or visual sketchpad. Manipulation is mental resequencing of information based on the application of a specific rule.

High WMI scores indicate a well-developed ability to attend to auditory information, maintain it in temporary storage, and resequence it for use in problem solving. Low WMI scores may occur for many reasons, including distractibility, visual or auditory discrimination problems, difficulty actively maintaining information in conscious awareness, low storage capacity, difficulty manipulation information in working memory, or general low cognitive functioning. The WMI includes the following subtests: Digit Span, Arithmetic, and/or Letter-Number Sequencing.

**Processing Speed Index (PSI):**
The PSI measures the speed and accuracy of visual identification, decision making, and decision implementation. Performance on PSI related to visual scanning, visual discrimination, short-term visual memory, visuomotor skills, and concentration. High PSI scores indicate a well-developed ability to rapidly identify visual information, to make quick and accurate decisions, and to rapidly implement those decisions. Low PSI scores may occur for many reasons, including visual discrimination problems, distractibility, slowed decision making, motor difficulties, anxiety or depression, or generally slow cognitive speed. Research indicates a significant correlation between processing speed and intellectual ability and the sensitivity of processing speed measures to clinical conditions, such as ADHD, specific learning disorders, and autism spectrum disorder. The subtests contributing to the PSI are not measures of simple reaction time or simple visual discrimination; a cognitive decision-making and learning component is involved.

**Comparing WAIS-IV Index Scores (within an individual’s profile):**

VCI compared to the PRI:
In cases where the VCI is greater than the PRI, there is evidence to suggest a consistent weakness in the ability to use visual information for problem solving or a strength in verbal reasoning. If the VCI is less than the PRI, there may be a general weakness in the language functioning and verbal problem solving and reasoning.
WMI compared to VCI and PRI:
The Working Memory subtests measure capacity to manipulate information in conscious awareness to facilitate complex problem solving. The VCI and PRI represent more complex cognitive abilities which, in theory, should require the engagement of working memory skills in order to be applied effectively. In other words, low working memory ability may interfere with or inhibit the capacity to perform more complex mental operations.

PSI compared to VCI and PRI:
The Processing speed subtest measure the individual’s ability to rapidly identify, register, and make and implement decision about visual stimuli. The VCI and PRI represent more complex cognitive abilities that may be facilitated by the ability to think quickly and make accurate decisions. Slow cognitive processing speed could interfere with or inhibit the capacity to perform more complex mental operations, particularly on the Visual Spatial subtests and Figure Weights where speed can affect scores.

Wechsler Individual Achievement Test – 3rd Edition (WIAT-III)
The subtests of the WIAT-III require students to:

**Word Reading:** read increasingly difficult words

**Pseudoword Reading:** read/decode nonsense words phonetically. For example, sound out the made-up word “waim.”

**Reading Comprehension:** read grade-level passages silently and to then answer questions about the content of what was read. Students are able to look back at the passage during questions if they chose to do so. Some questions involve concrete facts while some require the student to draw inferences.

**Oral Reading Fluency:** read grade-level passages aloud. The score is based on the time (in seconds) required to read the passage (Oral Reading Rate) as well as the number of errors that are made during the task (Reading Accuracy).

**Sentence Composition:** write sentences using the appropriate syntax by combining sentences or writing sentences using specific words. Sentence Composition score is composed of the Sentence Combining task, which requires the student to read two or three sentences about a simple topic and then write one good sentence that incorporates all essentially information from the two or three sentences and “means the same thing,” and the Sentence Building task, which requires the student to write simple sentences using specific words (such as “of”). These tasks measure the ability to use appropriate grammar, syntax, and mechanics such as punctuation.

**Math Fluency:** complete as many simple (one or two digit) calculations within a one-minute time frame. Addition, subtraction, and multiplication tasks are presented individually. The Math Fluency score is a summary of these individual tasks.

**Numerical Operations:** complete increasingly difficult and complex math calculations already structured on paper. The student is not allowed to use a calculator.

**Delis-Kaplan Executive Functioning System (DKEFS):**

**Color-Word Interference Test**
The D-KEFS Color-Word Interference Test is similar to the Stroop (1935) procedure, which measures an individual’s ability to inhibit an over-learned verbal response (reading a word) in order to generate a conflicting response (saying the color of the print ink). It is primarily a measure of inhibition or impulse-control. Condition 1: Color Naming requires basic, rapid naming of the colors (squared printed on a page). Condition 2: Word Reading assesses reading fluency (for the printed name of three colors). Condition 3: Inhibition requires the client to inhibit verbal impulses (to read the word) and instead to name the color of the ink. Condition 4: Inhibition/switching requires inhibition as well as the ability to shift between reading words and saying colors as instructed. This is a measure of cognitive set shifting and the ability to maintain awareness of two different “rules” and to alter verbal responses accurately and quickly.

**Design Fluency**

The D-KEFS Design Fluency Test consists of three conditions and is primarily a non-verbal test of fluency, inhibition and mental set shifting. Conditions 1 and 2 require clients to rapidly create different designs by connecting filled or empty dots with four straight lines, keep track of these two “rules,” and monitor previously drawn responses. Condition 3: Switching adds an additional variable (“rule”) and requires clients to draw designs with four straight lines by alternating between empty and solid filled dots. Condition 3 requires executive functions including self-monitoring, holding rules in mind, shifting accurately between task demands, sustaining focus for 60 seconds, and using cognitive flexibility.

**Verbal Fluency**

The D-KEFS Verbal Fluency Test consists of three conditions and measures verbal fluency (the ability to “find” and speak words quickly). Condition 1: Letter Fluency taps the individual’s ability to generate words quickly that begin with specific letters. Condition 2: Category Fluency taps the individual’s ability to generate words quickly that belong to certain categories. Condition 3: Category Switching assesses the ability to alternate between retrieving words from two different categories. This requires self-monitoring and cognitive set-shifting as well as verbal fluency.


The Adaptive Behavior Assessment System-Second Edition (ABAS-II) is an instrument used to evaluate adaptive skills which are important to everyday living. The ABAS-II consists of an overall score, called the General Adaptive Composite (GAC). The GAC includes three domains: conceptual, social, and practical.

The **conceptual domain** is made up of communication skills (speech, language, listening, conversation skills, etc), functional academic skills (basic reading, writing, and math skills), and self-direction (skills needed for independence, responsibility, self-control: starting/completing tasks, following directions, making choices, etc). The **social domain** is made up of social (skills needed to interact socially, get along with others, having friends, showing/recognizing emotions, using manners, etc), and leisure skills (planning recreational activities, playing with others, following rules of games, etc). The **practical**
domain is made up of self-care (eating, dressing, bathing, toileting, grooming, hygiene, etc), home/school living (cleaning, property maintenance, food preparation, chores, etc), community use (using community resources, shopping, getting around the community), and health and safety skills (response to illness/injury, using medicines, showing caution, etc).

**Behavior Rating Inventory of Executive Functioning (BRIEF)**

The Behavior Rating Index of Executive Functioning (BRIEF) is an accurate and reliable measure of executive functioning capacities and the impact of these on academic and daily functioning. There are versions of the BRIEF to be completed by parents/caregivers/residential staff, teachers, and the child/teen. There are validity scales evaluate whether the person responded in an overly negative manner or was inconsistent in their responses. The BRIEF is divided into two primary areas of executive functioning: The Behavior Regulation Index (BRI) and the Metacognitive Index (MRI). The BRI includes measures of emotional and behavioral regulation and control including the ability to inhibit impulses, to be adequately flexible (with behavior and emotions), and to demonstrate age appropriate emotional control. The BRIEF MI assesses Metacognitive regulation, which refers to areas of cognitive control such as initiating for tasks (getting the brain “in gear”), using working memory, self-monitoring work products, completing tasks independently, planning, and organizing oneself, tasks, and materials.