WHAT OUR TESTS MEASURE AND REQUIRE OF THE CLIENT:

Sometimes parents or professionals are curious about what the client is required to do during the different tasks that make up each test. Here are descriptions of the tasks that make up our most frequently used tests:

Description of Subtests and Index Scores for Wechsler Intelligence Scale for Adults and Children (WAIS-IV and WISC-V)

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).

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 information. Questions are presented verbally and the student responds verbally. Therefore, moderate demands are placed on receptive and expressive language. No motor or visual processing is required. Questions tap areas such as history, science, geography, biology, culture. The format of the questions is straightforward, such as "Who is….," "What is ….," or "Where is……".

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.

WAIS-IV 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 nonverbal abstract thinking. The PRI includes the following subtests: Block Design, Matrix Reasoning, and Visual Puzzles.

WISC-V Spatial Index (VSI):
The VSI measures the ability to accurately interpret, organize and think with visual information by looking at non verbal reasoning skills and fluid thinking. It deals with evaluating visual details, understanding visual spatial relationships, and to completing hand-on construction tasks from viewing a model. It includes Block Design and Visual Puzzles.

WISC-V Fluid Reasoning Index (FRI):

The FRI measures the ability to detect underlying conceptual relationships among visual objects that includes inductive and quantitative reasoning, simultaneous processing, and abstract thinking to apply rules. It includes Matrix Reasoning and Figure Weights.

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 task 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.

Visual Puzzles: Is a task that assesses mental, non-motor, construction ability which requires visual and spatial reasoning, mental rotation, visual working memory, understanding part-whole relationships, and the ability to analyze and synthesize abstract visual stimuli. The child views a completed puzzle and then selects three response options that would combine to reconstruct the puzzle. They have 30 seconds to complete this task.

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.

Figure Weights: Is a task designed to assess quantitative fluid reasoning. This task requires the child to apply the quantitative concept of equality to understand the relationship among objects and then to use the concepts of matching, addition, and/or multiplication to identify the correct response.

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 re-sequencing 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 re-sequence 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.

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 an simple operation with the information (such as re-ordering the numbers). There is no visual information presented or motor response required.

Arithmetic: 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.

<u>Picture Span:</u> Is a task that assesses visual working memory of semantically meaningful information. The student is shown pictures of common objects on a computer screen and asked to remember the order of the objects. On the next screen the student is asked to point to the objects in the order that they were presented on the previous page. No expressive language or motor output is required. The child simply touches the computer screen.

Number-Letter Sequencing: Is a supplementary verbal task that requires individuals to reorder a series of letters and numbers based 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.

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.

<u>Coding:</u> 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 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.

Cancellation: A supplementary test that measures measures rapid visual scanning, visual vigilance/neglect, selective attention, and speed in processing visual-only information. It is a timed test and consists of two trials of 45 seconds each. The test requires the individual to scan a two-page spread of relatively small colorful pictures. The pictures include animals and objects and the task is to identify all the appearances of the target animal. Cancellation requires a simple motor response (such as a slash mark). No expressive language or higher order reasoning is required.

Full Scale IQ Score (FSIQ):
The FSIQ is the "overall" measure of cognitive ability. While the FSIQ is the "score" that is referred to when discussing intellectual ability, the reality is that the FSIQ is simply a mathematical average of the various subtests given. If there is a lot of variability between the scores, particularly the main index scores (VCI, WMI, etc.), the FSIQ is not meaningful because it does not capture the important strengths and weaknesses in this single "number" (score).

General Ability Index (GAI):

The GAI is a composite score that is based on the three Verbal Comprehension and three Perceptual Reasoning subtests, and does not include the Working Memory or Processing Speed subtests included in the Full Scale IQ (FSIQ). The GAI is designed to measure the ability to learn and engage in abstract thinking and problem solving while minimizing the influence of executive functioning and working memory. It is often used to accurately measure cognitive abilities when there is a large discrepancy between various WISC-V or WAIS-IV composite scores.

Cognitive Processing Index (CPI):

The WAIS-IV or WISC-V combines an individual's performance on the Working Memory and Processing Speed indices into a single score called the Cognitive Proficiency Index (CPI). This is a broad measure of cognitive efficiency and flexibility, and is a succinct way to compare an individual's global executive functions with her "intellect" (verbal and nonverbal intellectual abilities, VCI and PRI).   Learning, memory, and adaptive functioning involve a combination of *routine* information processing (sustaining attention, using working memory, completing simple tasks like adding single digits) and complex information processing (solving algebraic equations). Therefore adequate Cognitive Proficiency and the ability to efficiently process *routine* information frees up cognitive resources and enables the use of "intellect" and higher-level thinking skills so that it is possible to process complex information and tasks.

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) Test Descriptions

Reading
<u>Word Reading:</u> is the act of reading difficult words
<u>Pseudoword Decoding:</u> means to read or decode nonsense words phonetically such as sounding out the made-up word "waim."
<u>Oral Reading Fluency:</u> means reading aloud and includes two components: Oral Reading Rate and Oral Reading Accuracy.
<u>Oral Reading Rate</u> is the time taken to read a passage aloud
<u>Oral Reading Accuracy</u> is of the number of errors made when reading a passage aloud.
<u>Reading Comprehension:</u> reading 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 Comprehension:
<u>Sentence Repetition:</u> requires the student to listen to a sentence of increasingly length and complexity and repeat it back verbatim. Points are deducted for any alterations made to the sentence, including the sequence of the wording. No reading or writing is required for this task.

Writing
<u>Essay Composition:</u> a written a paragraph that measured the ability to use appropriate syntax by combining sentences or writing sentences using specific words.
<u>Word Count:</u> is the number of words used in the essay
<u>Theme Development and Text Organization:</u> is the ability to organize sentences and to use the "rules of written language"
<u>Sentence Composition:</u> measures the ability to write sentences using the appropriate syntax by combining sentences or writing sentences using specific words.
<u>Sentence Combining task:</u> 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"

<u>Sentence Building task:</u> requires the student to write simple sentences using specific words (such as "of").

<u>Spelling:</u> ability to spell increasingly difficult words. Words were presented orally and responses were written on paper.

Math

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

<u>Math Problem Solving</u>: Measures untimed math problem-solving skills in the following domains: basic concepts, everyday applications, geometry, and algebra. The student provides oral and pointing responses. They can use paper and pencil to complete problems if they desire but then choose from answers/solutions presented.

<u>Math Fluency: (Addition, Subtraction, and Multiplication):</u> 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.

Kaufman Test of Educational Achievement (KTEA)

Reading

<u>Letter and Word Recognition:</u> The student identifies letters and reads grade- or age-appropriate words

<u>Nonsense Word Decoding:</u> The student pronounces or "sounds out" made up words

<u>Reading Comprehension:</u> The student reads symbols, words, sentences, and passages appropriate to his or her grade level, and then responds to comprehension questions.

<u>Reading Vocabulary:</u> The student reads a word in the context of a picture (early items) or a sentence (later items), and then selects a word that means the same thing.

Reading Fluency

<u>Word Recognition Fluency:</u> The student reads as many words as possible within a time limit.

<u>Decoding Fluency:</u> The student reads as many made-up words as

possible within a time limit.

Silent Reading Fluency: The student has two minutes to silently read simple questions, and circle yes or no to each one.

Mathematics

Math Concepts and Application: The student solves math problems that relate to real life situations and assess skills such as number concepts, arithmetic, time and money, and measurement.

Math Computation: The student solves written math calculation problems.

Math Fluency: The student writes answers to simple arithmetic problems within a time limit. Problems include addition and subtraction, and for later items, multiplication and division.

Writing

Written Expression: The student hears a story presented with pictures in a booklet and completes the story by writing letters, words, sentences, and (for students in grade 1 or higher) an essay.

Writing Fluency: The student writes simple sentences, each one describing a different picture, within a time limit.

Spelling: The student writes single letters and spells words dictated by the examiner.

Oral Language

Listening Comprehension: The student listens to sentences or passages, and then responds to comprehension questions.

Oral Expression: The student says a sentence to describe a photograph. Later items require the use of specific words or phrases.

Associational Fluency: The student has 60 seconds to say as many words as possible that belong to a particular category, such as animals or games.

Language Processing

Phonological Processing: The student responds orally to items that require manipulation of the sounds within words.

Object Naming Facility: The student names pictured objects as quickly as possible.

Letter Naming Facility: The student names upper- and lowercase letters as quickly as possible.

Gray Oral Reading Test – Fourth Edition (GORT-4).

This test required Client to read extended paragraphs rapidly out loud, while assessing her ability to read quickly (Rate Score), pronounce words correctly (Accuracy Score), and answer comprehension questions about the text after it had been read (Comprehension Score). The GORT-4 also generates a measure that combines reading rate and accuracy, which is referred to as the Fluency Score.

The Adaptive Behavior Assessment System-Second Edition (ABAS-II)

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). The ABAS enables measurement of the client's adaptive skills as compared to peers their own age.

Achenbach Adult Self-Report Form / Achenbach Child Behavior Checklist and Teacher Report Form

The Achenbach syndrome scales include the Internalizing scales, Externalizing scales, and three additional scales used to assess adaptive and maladaptive behaviors. The measure also assess for additional difficulties with Obsessive-Compulsive Behaviors, problems related to stress, and sluggish-cognitive tempo. In the teacher's report, the responses are based on the student's behavior and/or affect at school.

Adult ADHD Self-Report Scale (ASRS-v1.1) Symptom Checklist

This is a self-report measure completed by adults in a paper and pencil format. Part A: records the number of symptoms most highly correlated with an ADHD diagnosis. Part B: endorses the number and frequency of symptoms consistent with an ADHD diagnosis.

The Autism Diagnostic Observation Schedule (ADOS)

ADOS is a semi-structured observation instrument designed to elicit and observe social and communicative behaviors. It is also used to help determine the presence of an Autism Spectrum Disorder. Module Four was used as it is appropriate for use with adolescents and adults who have fluent speech. It includes activities such as gestural demonstration tasks, understanding of emotions and social relationships, assessment of conversation skills, and understanding of nonverbal communication. From the client's perspective, the ADOS activities do not seem like "testing" and the client is typically not aware that the ADOS is being administered. The ADOS includes tasks such as engaging in play with toys or objects, telling a story from a picture book, pretending to do things like brush teeth, or answering questions about what they think about everyday activities or relationships. The details of the client's responses and their interactions with the examiner are scored in detail to quantify different aspects of social and emotional functioning.

On the ADOS, higher ratings are indicative of more symptoms of Autism, and ratings that are above the Autism Spectrum Cutoff ratings are suggestive of an Autism Spectrum Disorder. The Communication + Social Interaction score is the overall rating.

Beck Inventories-II

The Beck scales are well-established valid and reliable self-report measures completed by adults. The scales measure the number, intensity, and frequency of various symptoms, behaviors, thoughts, and perceptions to determine whether concerns in each area are more similar to the typical/non-clinical population of individuals the same age as the client ("average" scores) or whether responses are more similar to same aged individuals with clinically significant issues and established diagnoses (elevated scores). The Self-Concept scale measures an individual's positive perceptions and feelings about themselves.

Beery Test of Visual Motor Integration

The Beery VMI test asseses for visual-motor deficits that can lead to neuropsychological, learning, and behavior difficulties. This test assesses the extent to which an individual can integrate their visual and motor abilities. Students are presented with drawings of geometric forms of increasing complexity and asked to copy them. This non-verbal assessment provides useful information with regard to an adult's current level of basic gross motor, fine motor, visual and visual-fine motor development.

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 that 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 BRIEF *Behavioral Regulation Index* (BRI) assesses for problems associated with impulse control and ability to inhibit behavior (Inhibit), to solve problems flexibly (Shift), and to appropriately modulate emotional responses (Emotional Control).
The BRIEF *Metacognition Index* assesses cognitive control and includes measures that assess initiating tasks and ideas (Initiate Scale), holding information in mind for use on tasks (Working Memory Scale), anticipating future actions, setting goals and working in a systematic manner (Plan/Organize), maintenance of materials and space in an orderly manner (Organization of Material), and checking work, assessing performance and monitoring how one's behaviors affect others (Monitor Scale). BRIEF results help to explain notable problems with academic and adaptive functioning, despite having solid intellectual abilities and basic academic skills.

Brown Adult ADHD Rating Scales

The Brown ADHD Scales for Adults asks the respondent to describe the frequency of Attention-Deficit/Hyperactivity Disorder (ADHD) symptoms occurring in their present life.

CELF-5: Clinical Evaluation of Language Fundamentals – Fifth Edition (CELF-5)

The CELF-V is a formal measure of one's language abilities which assesses ability to verbally sequence familiar information as quickly as possible.

Word Classes: subtests evaluate the ability to understand relationships between words that are related by semantic class features. This

examinee is read four words and asked to choose the two words that "go together" and why. The ability to understand the relationships between words is important in order to focus or extend word meanings in spoken or written language, which develop semantic networks that facilitate the encoding and retrieval of words and meanings.
<u>Following Directions:</u> evaluates a student's ability to interpret spoken directions of increasing length and complexity and follow the order of presented objects with varying characteristics, and identify several pictured objects that were mentioned. Following directions heavily taps working memory and the ability to "hold" directions in mind while engaging in sequential processing.

<u>Recalling Sentences:</u> assesses a client's ability to repeat increasingly lengthy sentences with accuracy.

<u>Understanding Spoken Paragraphs:</u> designed to assess one's abilities to sustain focus while listening to paragraphs of increasing length, derive meaning from oral narratives, answer questions about what has been heard, use critical thinking to interpret/infer beyond what is presented in the story. This task taps into several domains of language functioning.

<u>Formulated Sentences:</u> This subtest is used to evaluate the ability to verbally sequence familiar information as quickly as possible. It measures cognitive functions such as attention, memory for sequential information, and sequencing or manipulating familiar or overlearned information. The examinee is asked to perform tasks such as saying the days of the week and counting backwards from 20 as quickly as possible without making errors and while being timed.

CELF 5: Clinical Evaluation of Language Fundamentals – Fifth Edition Metalinguistics

The CELF-5 Metalinguistics diagnostic battery includes test that are designed to measure a
student's communication abilities in multiple contexts.

<u>Metalinguistics Profile:</u> The objective of the Metalinguistics Profile subtest is to obtain information about a student's metalinguistic skills in

everyday educational and social contexts. The information complements the evidence of metalinguistic strengths and weaknesses identified by the other tests that comprise the CELF-5 Metalinguistics test battery. The skills that are evaluated link to academic curriculum objectives for metalinguistic skills such as making inferences and predictions, understanding and using figurative language, understanding that words and sentences can have multiple meanings, and exhibiting appropriate discourse skills such as differentiating between situations that require formal and informal registers. As students move from one grade to the next, there is an expectation that their metalinguistic abilities and language competence will increase to keep up with demands of curricular and non-curricular activities. The profile is a rating scale that is completed by the clinician with input from parents/caregivers, teachers, or other informants who provide information to assist in the evaluation of a student's language competence and metalinguistic abilities in academic and social settings.

Making Inferences: used to evaluate the ability to make logical inferences when given the beginning and end of a familiar sequence.

Conversation Skills: used to evaluate the student's ability to produce a conversationally appropriate utterance given the context (situation) and two or three stimulus words.

Multiple Meanings: used to evaluate the student's ability to detect lexical (word-level) and structural (sentence-level) ambiguities.

Figurative Language: used to evaluate the student's ability to interpret figurative expressions within a given situational context.

The scaled scores, composite standard scores (index scores), and percentile ranks utilized enhance clinical decision making.

Comprehensive Tests of Phonological Processing CTOPP-2

Phonological processing is a type of auditory processing that refers to the sound structure of one's oral language, which is needed for learning

to read (i.e. the ability to decode a word phonetically and read or pronounce it correctly.) There are three types of phonological processing that are particularly important in learning to read and these include rapid naming, phonological awareness, and phonological memory.

Rapid naming: is the ability to efficiently retrieve information from long-term or immediate memory. Efficient retrieval of phonological information and the execution of a sequence of executive operations are required when readers attempt to decode unfamiliar words. Low scores on the Rapid Naming Composite tend to be associated with low reading fluency rates while average or high scores tend to support good reading fluency. On both the Rapid Digit Naming and Rapid Letter Naming tasks, the examinee is presented pages on which either individual numbers or letters are printed. They are asked to read the numbers and then letters as quickly as possible and the time of completion is converted to a standard score based on the normative sample.

Phonological awareness: refers to an individual's awareness of and access to the sound structure of his or his language. Deficits in phonological awareness are viewed as the hallmark of dysphonetic dyslexia. This is also the component that tends to be most responsive to targeted intervention. The Phonological Awareness Composite consists of the subtests Ellison, Phoneme Isolation, and Blending Words. During the Ellison subtest, the examinee is read words and asked to remove specific sounds (phonemes) from the words. The Blending Words task requires examinees to listen to words presented slowly, one phoneme at a time, and say the word that was presented. The Phoneme Isolation test required Client to identify phonemes in words based on oral instructions (for example: "What is the second sound in the word *apartment*?").

Phonological memory: the ability to code information phonologically for temporary storage in working (short-term) auditory memory. Specifically, the Phonological Memory Composite Score assesses the functioning of part of memory called the phonological loop, which provides brief verbatim storage of auditory information. The phonological loop is comprised of phonological storage that records the

most recent 2 seconds of auditory information and of an articulatory control process that can refresh information already in the phonological loop so that it can be stored for longer than 2 seconds. During Memory for Digits, the examinee is read a series of random numbers of increasing length and required to repeat them verbatim.   During the Nonword Repetition Task, the examinee is read nonsense words of increasing length and is required to repeat them accurately.

California Verbal Learning Test (CVLT)

This measure assesses various components of verbal learning and memory. The client is read a list of common words across several trails and asked to recall/verbalize as many of the words on the list as possible. Evaluating the number of words remembered across multiple trials helps to evaluate how factors such as repetition and retrieval strategies impact memory and learning.

Delis-Kaplan Executive Functioning System (D-KEFS)

To further assess Client's skills across a variety of executive functions, the Delis-Kaplan Executive Function System (D-KEFS) was administered. "Executive functions" refers to the integrated operations of the brain. These functions are responsible for management of numerous interconnected and interdependent cerebral activities and include skills such as impulse control (i.e. being able to inhibit an automatic response), initiating and activating for tasks, utilizing working memory, shifting from one thing to another as the situation demands it (mental set-shifting or cognitive flexibility), planning ahead, organizing, self-monitoring, reasoning abstractly (inductive and deductive reasoning), integrating multiple pieces of information to form conclusions or make decisions, and regulating emotions and behavior.

D-KEFS Color-Word Interference Test: measures an individual's ability to inhibit an overlearned 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 based on time. 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.

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.

The D-KEFS Verbal Fluency Test: consists of three conditions and measures verbal fluency (the ability to "find" and speak words quickly pertaining to a given category). 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 D-KEFS Trail Making Test: consists of several conditions that require a non-verbal or motor response. The primary executive function task is the Number-Letter Switching (Condition 4), which requires mental set-shifting and cognitive flexibility. This task requires clients to sequence letters and numbers on paper by connecting the "dots" (targets) in ascending order while alternating between numbers and

letters. Trailmaking measures visual scanning, visual sequencing, cognitive flexibility in the visual domain, simultaneous processing, the ability to "hold" instructions in mind, self-monitor, and shift responses as required by instructions.

The D-KEFS Tower Test: requires subjects to reorder wooden rings of decreasing size based on specific rules. The Tower Test measures the ability to engage in nonverbal planning and logic, sequential processing, and the ability to anticipate consequences and future actions. The tower test requires individuals to "see" several steps ahead in order to plan their "moves" to solve the puzzle.

Grooved Pegboard (GPB)

The Grooved Pegboard (GPB) is a measure of manipulative dexterity, visual-motor coordination, hand-eye coordination, and concentration. Clients are asked to orient 25 metal pegs into slots in a grooved pegboard. Scores were measured in the time taken to insert all pegs correctly using dominant and nondominant hands.

Modern Language Aptitude Test (MLAT)

The Modern Language Aptitude Test (MLAT) is designed to measure an individual's ability to learn a foreign language. It is particularly useful in predicting success in learning to speak and understand a foreign language and learning to read, write, and translate a foreign language. It is applicable in connection with both "modern" spoken languages as well as ancient languages such as Latin or Greek. The MLAT distinguishes distinct abilities/factors of foreign language aptitude that are separate from motivation and verbal intelligence. These include skills such as the ability to identify distinct sounds, to form associations between those sounds and symbols representing them, and to retain these associations. The MLAT also assesses rote learning ability; the ability to learn associations between sounds and meanings rapidly and efficiently, and to retain these associations.

Number Learning: Part I measures aspects of memory for foreign language including auditory alertness and auditory comprehension. On

Part I, Client was required to learn the association between 16 numbers spoken aloud in English and the corresponding name of the number spoken in a foreign language (made up language). Client was required to listen to numbers spoken in the foreign language and write the corresponding numerals (1 to 4) on the answer sheet.

Phonetic Script: Part II of the MLAT, Phonetic Script, measures sound-symbol associational ability (the ability to learn the correspondence between speech sounds and orthographic/written symbols). This also correlates highly with the ability to mimic and remember speech sounds and sound combinations in foreign languages. On Part II, Client was required to listen to the sounds of one syllable words while reading the corresponding written letters/symbols. Unfamiliar symbols were paired with regular English phonemes.

Million measures of personality functioning for adults and children:

MCMI: The Millon Clinical Multiaxial Inventory-Third Edition (MCMI-III) or Fourth Edition (MCMI-IV) are self-report inventories designed to provide information pertaining to the respondent's personality style, emotional functioning and the presences of problematic symptoms and patterns of behavior, including symptoms associated with psychiatric disorders that are included in the Diagnostic and Statistical Manual-Fifth Edition (DSM-V). The MCMI requires adults to answer True/False questions on in paper and pencil format or on an electronic device.

M-PACI: The Millon Pre-Adolescent Clinical Inventory (M-PACI) is a self-report inventory that is designed to be user friendly for children and young adolescents. The M-PACI assesses emerging personality and coping styles and provides and integrates this with signs of clinical problems or syndromes. There are validity scales to monitor response patterns. The M-PACI interpretive report provides a summary of potential treatment strategies, tailored to each patient. This information can help clinicians decide which issues to focus on during treatment and how to address them with the patient.

MACI: The Millon Adolescent Clinical Inventory (MACI) is a self report inventory that assesses personality styles, significant problems or

concerns, and clinical symptoms in adolescents. The MACI contains the following scales: Personality Patterns scales, Expressed Concerns scales, Clinical Syndromes scales, Modifying Indices, a validity scale, and Grossman Personality Facet Scales. It includes personality variables based on DSM-IV classifications, expressed concerns appropriate to adolescents, and clinical syndromes of significance.

Revised Children's Anxiety and Depression Scales (RCADS and P-RCADS):

The RCADS or P-RCADS are report measures completed by the client or by the client's parents regarding observed symptoms, behaviors, emotions, and functioning demonstrated at home, school, and in the community. The measures evaluate the number, frequency, and intensity of symptoms typically associated with diagnoses of anxiety and depressive disorders.

Rey Osterrieth Complex Figure Test (REY CFT)

The Rey CFT measures visual perception, visual-spatial organization, visual-motor integration, and visual memory. The Rey requires the examinee to copy a complex figure design using paper and pencil. The direct copy response is scored based on a set of criteria that evaluates the accuracy of the design drawn. The direct copy score evaluates the examinees ability to "see" the complex design (visual-spatial perception) and then to plan and execute the drawing, which requires the ability to organize and integrate complex details. After a delay of 30 minutes, the examinee is asked to draw the design from memory. The recall condition additionally assesses the ability to encode and later recall visual information (visual memory). The test also requires the ability to effectively plan and organize, which has been associated with executive functions.

Rorschach InkBlot Test

The Rorschach Inkblot Test is a measure of perception, cognitive, and emotional processing. The Rorschach is often used to evaluate whether there are issues with disordered thinking or problems with reality testing. The Rorschach provides information about how the client perceives and approaches stimuli and experiences. The Rorschach requires clients to look at ink blots printed on a card and to describe what they see. The Rorschach and the scoring system that we use is one of the most well-researched tools of psychological evaluation that exists today.

Social Responsiveness Scale (SRS)

Social Responsiveness Scale (SRS) is a questionnaire based tool to assess the different dimensions of interpersonal behavior, communication, and repetitive/stereotypic behavior that may be characteristic of social and developmental disorders. The SRS is a self-report measure of the individual's social skills and functioning. The scales are then assessed and correlated to create an overall score to indicate the likelihood of an Autism Spectrum Disorder diagnosis being appropriate or to evaluate the impact of self-regulation issues on social functioning.

TAT: Thematic Apperception Test or Roberts Apperception Test

The client is presented with pictures of people and social or interpersonal situations and asked to create a story based on the picture.

Trail Making Test

The Trail Making Test is a measure of visuospatial scanning, motor sequencing skills, cognitive flexibility, planning, and executive functioning. The client is asked to rapidly connect numbers and letters on a printed page, in ascending order.

Vanderbilt ADHD Diagnostic Parent Rating Scale (VADPRS)

The Vanderbilt assessments evaluate for ADHD symptoms and other commonly associated behavior problems across home and school settings. It helps to see if behaviors are consistently displayed in both areas or isolated to one, which can provide more insight and guide interventions. Additionally, this measure assesses for specific forms of ADHD and other issues, including school performance.

Wide Range Assessment of Memory and Learning (WRAML)

Story Recall tasks: measure auditory memory. The examiner reads two stories aloud and asks the client to immediately recall the stories as verbatim as possible. The client is asked to recall the story again after a 30-minute delay. The WRAML design memory task assesses memory for visually-presented information. Clients are presented with novel, detailed visual stimuli and asked to recall (draw) as many details as possible.

Verbal Learning task: This is a measure of auditory, verbal learning. The client is read a list of common words across several trails and asked to recall/verbalize as many of the words on the list as possible. Evaluating the number of words remembered across multiple trials helps to evaluate how factors such as repetition and retrieval strategies impact memory and learning.

Design Memory: On the Design Memory subtest, also a measure of visual memory, the client is shown a series of novel designs (shapes) and asked to reproduce them from memory by immediately drawing them on paper.

Picture memory task: presents client with a series of detailed photographs and asked to recall immediately and after a delay as many of the details from these pictures as possible.