



WWW.BEATTHEBOARDS.COM

LIGHTNING REVIEW

OF

NEUROPSY- CHOLOGICAL ASSESSMENTS

JACK KRASUSKI, MD



LIGHTNING REVIEW OF NEUROPSYCHOLOGICAL ASSESSMENTS

GEARED TO PSYCHIATRY BOARD EXAM PREPARATION

Jack Krasuski, MD

Executive Director American Physician Institute
drjack@americanphysician.com

Copyright Notice: Copyright © 2008-2025 American Physician Institute for Advanced Professional Studies, LLC. All rights reserved. This manuscript may not be transmitted, copied, reprinted, in whole or in part, without the express written permission of the copyright holder. Requests for permission or further information should be addressed to Jack Krasuski at: DrJack@AmericanPhysician.com or American Physician Institute for Advanced Professional Studies, LLC, 1 Mid America Plaza, Oakbrook Terrace, IL 60181

Disclaimer Notice: This publication is designed to provide general educational advice. It is provided to the reader with the understanding that Jack Krasuski and American Physician Institute for Advanced Professional Studies LLC are not rendering medical services and are not affiliated with the American Board of Psychiatry and Neurology. If medical or other expert assistance is required, the services of a medical or other consultant should be obtained. The author and publisher disclaim any liability arising directly or indirectly from the use of this book.

Table of Contents

Psychological Testing Overview	4
Wechsler Adult Intelligence Scale, Version IV (WAIS-IV)	6
Wechsler Intelligence Scale for Children, Version IV (WISC-IV)	7
Wechsler Preschool & Primary Scale of Intelligence, Version III (WPPSI-III)	7
Leiter International Performance Scale- Revised	8
Bayley Scales of Infant & Toddler Development	8
Wechsler Individual Achievement Test (WAIT-III)	9
Peabody Individual Achievement Test Revised (PIAT-R)	9
Wechsler Memory Scale, Version IV (WMS-IV)	10
Auditory-Verbal Learning Test (AVLT)	10
California Verbal Learning Test	10
Hopkins Verbal Learning Test- Revised (HVLTR)	10
Peabody Picture Vocabulary Test (PPVT)	11
Boston Diagnostic Aphasia Examination, Version III (BDAE-III)	11
Western Aphasia Battery-Revised (WAB-R)	11
Stroop Color & Word Test	12
Wisconsin Card Sorting Test	12
Conner's Continuous Performance Test	14
Test of Variables of Attention (T.O.V.A)	14
Halstead Reitan Neuropsychological Battery (HRNB)	15
Luria-Nebraska Neuropsychological Battery (LNNB)	15
Minnesota Multiphasic Personality Inventory, Version 2 (MMPI-2)	16
Thematic Apperception Test	18



Psychological Testing Overview

Before reviewing the individual assessment instruments, I begin with an overview of the categories in which neuropsychological and psychological assessments fall. Once you understand the big picture, you will better understand the role of each individual assessment instrument.

Main Categories of Assessment Instruments

- IQ tests
- Achievement tests
- Tests of adaptive function
- Tests of cognitive functions
 - Tests of individual cognitive function
 - Batteries: comprehensive series of tests
- Personality tests

IQ Tests

- Background: David Wechsler, the neuropsychologist who developed several IQ tests described intelligence as "the global capacity of a person to act purposefully, to think rationally, and to deal effectively with his/her environment." Note the word 'global.' Thus, intelligence is hypothesized to be a measure of general mental ability.
- When: order IQ tests in children, adolescents, and adults when a diminished intellectual capacity is suspected or school performance is poor.
- Examples of available IQ tests
 - Wechsler Adult Intelligence Scale
 - Stanford-Binet Intelligence Scale
 - Wechsler Intelligence Scale for Children
 - Wechsler Preschool & Performance Scale of Intelligence
 - Bayley Scale for Infant & Toddler Development
 - Leiter International Performance Scale (a specialized non-verbal test)
- Always ensure the child or adolescent with poor school performance or disruptive behavior is tested for hearing and vision since sensory impairments can present similarly.

Achievement Tests

- Background: Achievement tests measure a student's acquired knowledge and skills in the major educational areas. The key word here is 'acquired,' which refers to measuring what the student actually has learned in school. The types of achievement measured are: reading, mathematics, and language skills.
- When: order achievement tests when a student shows poor school performance. Order both an IQ test and an achievement test and look for a discrepancy between the IQ test and achievement test results. A discrepancy between normal or higher IQ scores and poor school performance suggests a problem other than limited intellectual capacity as an explanation for the poor school performance. Such a discrepancy should trigger a careful exploration for presence of 1) psychopathology such as, for example, depression, anxiety, trauma, ADHD, and substance use, and 2) psychosocial stressors such as, for example, abuse, neglect, and domestic violence.
- Examples of commonly available achievement tests
 - Wechsler Individual Achievement Test
 - Peabody Individual Achievement Test
 - Woodcock Johnson III Test of Achievement
 - Wide-range Achievement Test
 - Tests of Adaptive Function
- Background: When diagnosing intellectual disability or dementia/neurocognitive disorder (NCD), the diagnosis requires more than an assessment of intellectual or cognitive function. Diagnosis also requires an assessment of adaptive function. Note that irrespective of IQ score, if a patient meets the standards for adaptive ability for their age and cultural group, then they do NOT have intellectual disability.
- When: conduct an assessment of adaptive function in patients with suspected intellectual disability, cognitive impairment, autism spectrum disorders, and poor school performance or behavioral problems.
- Example of test of adaptive function
 - Vineland Adaptive Function Scale

Tests of Cognitive Functions

- Background: the main divisions of cognitive function are as follows:
 - Attention
 - Language: receptive, expressive, word finding
 - Memory: verbal, visual
 - Motor: gross, fine, procedural memory (praxis)
 - Construction
 - Perception (agnosia)
 - Executive function
- A large number of cognitive assessments exist for assessing each cognitive domain. You usually will be able to recognize them by their titles, which often make clear what they assess. For example, the Peabody Picture Vocabulary Test assesses vocabulary, a language function, by showing the subject a card of four pictures and requesting that the subject point to the picture showing an object related to the word spoken by the examiner.
- In addition, there exist neuropsychological batteries, which are bundled series of cognitive tests that assess a broad range of cognitive domains.
- Examples of neuropsychological batteries
 - Halstead-Reitan
 - Luria-Nebraska

Personality or Psychological Tests

- Background: this category of tests shed light on a patient's personality and emotional function and, also, can help identify some forms of psychopathology more clearly than can be identified through clinical interviewing. For instance, the Minnesota Multiphasic Personality Inventory (MMPI), Thematic Apperception Test (TAT), and Rorschach Test can identify psychotic beliefs that the patient may be too guarded to share during a diagnostic interview.
- When: when personality and emotional function needs further assessment, or when psychosis is suspected but cannot be delineated through interview. Additionally, the MMPI is used to help identify malingering or factitious disorders

- Examples
 - Thematic Apperception Test (TAT)
 - Minnesota Multiphasic Personality Inventory (MMPI)
 - Rorschach Test

Intelligence Tests

Concepts Relevant to IQ Tests

Before I begin presenting the various IQ testing options, I present a few concepts relevant to our understanding.

- Intelligence Quotient (IQ) Test Definition
 - An intelligence test is a standardized test that measures potential ability or learning capacity. This is in contradistinction to an achievement test, which measures acquired learning, in a specific subject area such as reading or arithmetic.
- Flynn Effect
 - The rise of IQ scores over the generations, that is, IQ scores have been rising over the period in which they've been given. The score increases have averaged about 3 IQ points per decade. Now, in several countries starting in the mid 1990's the Flynn effect has stopped or reversed, and IQ scores have been falling at rates similar to their previous increases.
 - The reason for the Flynn Effect is unclear. It may be due to rising intelligence levels but it may not. The tests that are most related to exposure to improved education are in fact the tests that have NOT seen the largest score increases. Rather the largest score increases are on tests, such as Raven Progressive Matrices that are loaded for general intelligence factors
 - The Flynn Effect is one reason that IQ tests need to be renormed, which means recalibrating scores over time to maintain a mean score of 100 points.
- Nonverbal Intelligence Tests
 - Under normal circumstances, verbal responses are assumed to provide an indication of a person's intelligence. However, in some individuals the verbal response is not an appropriate measure of their intelligence

and other assessment approaches must be used. For example, some individuals have features that interfere with their ability to provide a verbal response and, thus, the verbal response is not a true measure of their intelligence. The features that interfere with a verbal response include the following.

- Lack of fluency in the language of the test
- Speech and language impairment
- Hearing impairment
- Selective neurological trauma
- Emotional problems such as elective mutism
- Culturally different backgrounds
- Illiteracy
- Reduced Language Assessments
 - Some assessment instruments are not fully non-verbal because they require presentation of test instruction verbally by the administrator to the person being tested. These reduced language assessments include the following.
 - Wechsler Performance Scale
 - Differential Abilities Scale
- True Nonverbal Assessments. The following instruments are fully non-verbal. They neither require verbal instructions nor verbal responses.
 - Leiter International Performance Test
 - Test of Non-Verbal Intelligence (TONI-3)
 - Comprehensive Test of Nonverbal Intelligence (CTONI)
 - Universal Nonverbal Intelligence Test

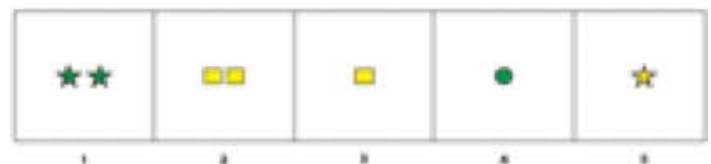
Wechsler Adult Intelligence Scale, Version IV (WAIS-IV)

- What: an IQ test that generates an IQ score. David Wechsler defined intelligence as "The global capacity of a person to act purposefully, to think rationally, and to deal effectively with his/her environment."
- Who: persons between ages of 16-90 years
- When:
 - When a general IQ test is required
 - When a gap between intelligence and achievement is suspected

• Details

- WAIS-IV includes 10 core subtests and an additional 5 supplemental ones. The supplemental subtests are used only in rare circumstances, including cases in which the core subtest results are spoiled.
- The 10 subtests are equally weighted to provide the Full Scale IQ (FSIQ) Score. They are also used to generate a General Abilities Index (GAI)
- The 10 subtests are grouped into four indices, as summarized below.
- Verbal Comprehension Index
 - Similarities
 - Vocabulary
 - Information
- Perceptual Reasoning Index
 - Block design
 - Matrix Reasoning
 - Visual Puzzles
- Working Memory Index
 - Digit Span
 - Arithmetic
- Processing Speed Index
 - Symbol Search
 - Coding

Sample WAIS-IV Question: "Which one of these goes at the question mark to balance the scale?"



Wechsler Intelligence Scale for Children, Version IV (WISC-IV)

- What: an IQ test that generates an IQ score
- Who: children ages 6:01-16:11
- When:
 - When a general IQ test is required
 - Used when specific Learning Disorders or ADHD are suspected even though empiric evidence suggests that WISC-IV is not particularly sensitive in identifying these conditions.

- Details
 - WISC-IV is in the family of Wechsler Intelligence Scales, each designed for a different age range.
 - WISC-IV includes 10 core subtests and an additional 5 supplemental ones.
 - The 10 subtests are equally weighted to provide the Full Scale IQ (FSIQ) Score.
 - They are grouped into four indices, as summarized below.

Verbal Comprehension Index (VCI)	<p>Measure: Verbal concept formation.</p> <p>It assesses children's ability to listen to a question, draw upon learned information from both formal and informal education, reason through an answer, and express their thoughts aloud. It can tap preferences for verbal information, a difficulty with novel and unexpected situations, or a desire for more time to process information rather than decide "on the spot."</p> <p>Note: This index is a good predictor of readiness for school and achievement orientation, but can be influenced by background, education, and cultural opportunities.</p>
Perceptual Reasoning Index (PRI)	<p>Measure: Non-verbal and fluid reasoning.</p> <p>It assesses children's ability to examine a problem, draw upon visual-motor and visual-spatial skills, organize their thoughts, create solutions, and then test them. It can also tap preferences for visual information, comfort with novel and unexpected situations, or a preference to learn by doing.</p>
Working Memory Index (WMI)	<p>Measure: Working memory.</p> <p>It assesses children's ability to memorize new information, hold it in short-term memory, concentrate, and manipulate that information to produce some result or reasoning processes. It is important in higher-order thinking, learning, and achievement. It can tap concentration, planning ability, cognitive flexibility, and sequencing skill, but is sensitive to anxiety too. It is an important component of learning and achievement, and ability to self-monitor.</p>
Processing Speed Index (PSI)	<p>Measure: Processing speed.</p> <p>It assesses children's abilities to focus attention and quickly scan, discriminate between, and sequentially order visual information. It requires persistence and planning ability, but is sensitive to motivation, difficulty working under a time pressure, and motor coordination too. Cultural factors seem to have little impact on it. It is related to reading performance and development too. It is related to Working Memory in that increased processing speed can decrease the load placed on working memory, while decreased processing speed can impair the effectiveness of working memory.</p>

Wechsler Preschool & Primary Scale of Intelligence, Version III (WPPSI-III)

- What: an IQ test for young children
- Who: children ages 2:6 to 7:7 years
- When: can be used when the following conditions are suspected: mental retardation (mild and moderate severity), developmental delay, ADHD, cognitively gifted, autistic, expressive language disorder, mixed receptive/ expressive language disorder
- Details
 - Scale has been divided into two age bands, 2:6-3:11 years and 4:0-7:7 years
 - Younger children take fewer subtests that are designed to measure verbal comprehension and perceptual organization abilities
 - Older children take a greater number of subtests designed to measure verbal comprehension, perceptual organization, and processing speed abilities

Leiter International Performance Scale- Revised

- What: measure of intelligence that is fully nonverbal
- Who: persons ages 2 to 20 years
- When:
 - When wide-ranging test of cognitive function is required in subjects who are cognitively delayed, disadvantaged, non-English speaking, hearing impaired, speech impaired, or autistic.
 - When cause of poor academic performance cannot be established. Leiter-R will help distinguish low IQ from a Learning Disorder from ADHD.
- Details:
 - Individually administered and lasting 25-40 minutes
 - Neither the examiner nor the subject are required to speak
 - The subject need not know how to read or write
 - Not influenced by socio-economic background, educational, or family experience
 - Game-like tasks
 - Four subtests: reasoning, visualization, memory, and attention

- Reasoning
 - Classification
 - Sequential Order
 - Repeated Patterns
 - Design Analogies
- Visualization
 - Matching
 - Picture Content
 - Figure-Ground
 - Paper Folding
 - Form Completion
 - Figure Rotation
- Memory
 - Forward Memory Span
 - Spatial Memory
 - Associative Memory
 - Immediate Recognition
 - Reverse Memory Span
 - Visual Coding (Symbol & Digit)
 - Associative Delayed Memory
 - Delayed Recognition
- Attention
 - Attention Sustained
 - Attention Divided

Test Nugget: the Leiter-R often comes up on exams as the test to use when cognitive functioning needs to be assessed in autistic individuals.

Bayley Scales of Infant & Toddler Development

- What: assessment for measuring developmental delays in the very young
- Who: children one month to 42 months
- When: Screen for suspected developmental delays. Tested and validated in the following populations of children.
 - Premature
 - Small for gestational age
 - Downs syndrome
 - Pervasive developmental disorder
 - Fetal Alcohol Syndrome / poly substance exposure
 - Asphyxia
 - Cerebral palsy
 - Language impairment

- Details
 - Covers all 5 areas of the “Individual With Disabilities Education Act” (IDEA)
 - Three scales administered with child interaction – cognitive, motor, language.
 - Two scales conducted with parent questionnaires – social-emotional, adaptive behavior.
 - Indicates strengths, weaknesses, and competencies so that parents and professionals can properly plan for the child
 - Aligns with IDEA requirements for support and intervention

Achievement Tests

Concepts Relevant to Achievement Tests

- Standardized achievement tests may assess any or all of reading, math, and written language as well as subject areas such as science and social studies. These tests are available to assess all grade levels and through adulthood. The test procedures are highly structured so that the testing process is the same for all students who take them.
- Students' answers on the achievement test are analyzed and scored according to specific guidelines required by the test publisher. The results are calculated into a raw score. Raw scores are converted into standard scores using appropriate tables for a child's age, and in some cases, time of school year. The resulting standard scores provide data to compare the student's abilities to others his or her age. Scores are interpreted using terms such as average, above average, and below average.
- Achievement tests are used to determine a student's academic strengths and weaknesses. When compared to intelligence test scores, achievement scores tell whether or not a child has the severe difference in ability and performance that indicates a learning disability or ADHD diagnosis. These scores also provide important information to help develop the child's individual education program.

Wechsler Individual Achievement Test (WIAT-III)

- What: an academic achievement test
- Who: ages 4:0 to 50:11. Three versions for the following grade levels:
 - PreK-K
 - Grades 1-6
 - Grades 7-16
- When:
 - Used for achievement skills assessment, learning disability diagnosis, special education placement, curriculum planning, and clinical appraisal
 - Also for the evaluation of and academic planning for college students with disabilities.
- Details
 - WIAT®-III provides norm-referenced information about all areas specified by the Individuals with Disabilities Education Act (IDEA).
 - Academic Areas:
 - Oral Language
 - Listening Comprehension
 - Written Expression
 - Spelling
 - Word Reading
 - Reading Comprehension
 - Numerical Operations
 - Mathematics Reasoning

Peabody Individual Achievement Test Revised (PIAT-R)

- What: test of academic achievement
- Who: children grades K-12, adults with brain damage
- When:
 - When academic performance is in question
 - When remaining cognitive function needs to be assessed in brain damaged adults
- Test Details: 5 tests. Takes about 60-90 minutes but not timed
 - Mathematics from simple number recognition to algebra
 - Reading Recognition: correctly read / pronounce words of increasing difficulty (“play” to “apophthegm”)

- Reading Comprehension: select correct drawing from described printed sentence
- Spelling: spell words of increasing difficulty
- General Information: a test of commonly known information

Memory Assessments

Wechsler Memory Scale, Version IV (WMS-IV)

- What: a memory battery
- Who: persons ages 16-90 years
- When:
 - Screen for undiagnosed mild dementia or mild cognitive impairment (MCI)
 - Assess for degree and type of memory impairment in brain-damaged adults
- Details
 - Scores now derived for Older Adult Battery (ages 65-90 years) and for Adult Battery (ages 16-69)
 - Version IV just released in 2009
 - Includes 5 indexes
 - Auditory Memory
 - Visual Memory
 - Visual Working Memory
 - Immediate Memory
 - Delayed Memory

Auditory-Verbal Learning Test (AVLT)

- What: test of immediate recall and longer term memory retention (Cat: Memory)
- Who: subjects with memory or more global cognitive impairment
- Test Details: examiner reads a list of 15 words and subject repeats back as many as he/she remembers. Examiner writes down the remembered words in the order subject recalled them. Examiner then rereads the entire list and subjects is asked to repeat back as many as he/she remembered, including the words remembered from previous trial. This procedure is repeated for a total of 5 trials. Examiner then reads a new list of 15 words and the same sequence is followed. Subjects can then be asked to repeat remembered words 30 minutes later or even the next day. Normal subjects recall 6-8 words on first trial that rises to 12-14 words on the fifth trial.

California Verbal Learning Test

- What: test of verbal memory with conceptual ability (Cat: Memory)
- Who: subjects with memory or more global cognitive impairment
- When: used for subjects with brain injury and with neurodegenerative disorders, such as Alzheimer's and Huntington's.
- Test Details:
 - This test is similar to the AVLT, except that the (in this case) 16 words on each list fall into one of four conceptual categories. For example, four words each fall into these categories: food, clothes, tools, spices.
 - This test assesses memory but, because the words to be recalled fall into distinct conceptual categories, it also assesses whether some categories of words are better recalled than others.

Hopkins Verbal Learning Test- Revised (HVLT-R)

- What: test of word recall / recognition test (Cat: Memory)
- Who: persons ages 16 years and older.
- When: use with subjects with memory or more global cognitive impairment. A screening tool for dementia and amnesic disorders
- Test Details
 - The HVLT-R tasks include three learning trials, a delayed recall trial (20-25 minute delay), and a yes/no delayed recognition trial.
 - Raw scores are derived for Total Recall, Delayed Recall, Retention (% retained), and a Recognition Discrimination Index.

Language / Aphasia Assessments

Peabody Picture Vocabulary Test (PPVT)

- What: vocabulary test (Cat: Verbal Comprehension)
- Who: children ages 2 ½ to 18
- When: tests comprehension in verbally handicapped subjects who need not respond verbally. Subjects point to correct answer.
- Test Details: 175 picture plates with 4 pictures on each plate. Subject points to the picture (out of the four) that is most similar to a stimulus word that is spoken by the examiner. The process is repeated until all the picture plates are presented. Although the PPVT is a test of a very narrow cognitive function (verbal comprehension), it is sometimes used as a stand-in IQ test because there is a high correlation between vocabulary and IQ scores.



Boston Diagnostic Aphasia Examination, Version III (BDAE-III)

- What: a method of identifying and classifying aphasia syndromes
- Who: adults
- When: when language impairment suspected. When nature and degree of deficits must be ascertained for designing an aphasia rehab program.
- Details
 - The BDAE evaluates language skills based on perceptual modalities (auditory, visual, and gestural), processing functions (comprehension, analysis, problem solving), and response modalities (writing, articulation, and manipulation).
 - The Boston Naming Test is incorporated into the BDAE and is useful in identifying mild word retrieval deficits.
 - Administration time ranges from 35 to 45 minutes.

Western Aphasia Battery-Revised (WAB-R)

- What: a method of identifying and classifying aphasia syndromes
- Who: persons ages 18-89 years
- When: when language impairment suspected. When nature and degree of deficits must be ascertained for designing an aphasia rehab program.
- Details
 - Alternative to BDAE.
 - Aphasia Syndromes Classified: Global, Broca's, Isolation, Transcortical Motor, Wernicke's, Transcortical Sensory, Conduction, Anomic
 - Language Functions Assessed: Content, Fluency, Auditory Comprehension, Repetition and Naming, Reading, Writing
 - The aphasia quotient (AQ) is the summary score that indicates overall severity of language impairment.
 - Other specific quotients are also derived, e.g., Oral Expression Quotient
 - Administration time is about 45 minutes

Frontal Lobe / Executive Function Assessments

Stroop Color & Word Test

- What: an assessment of frontal lobe function. It assesses ability to suppress interference from competing stimuli
- Who: 15 to 90 years. A separate version is available for children.
- When:
 - When frontal lobe impairment is suspected
 - To separate brain-damaged psychiatric patients from non-brain-damaged psychiatric patients.
- Details
 - The Stroop Color & Word Test is based on the concept that people can read words faster than they can identify and name colors. The implication of this is that subjects will be quicker to name a color when that color is imbedded in the written word for that color. For example, when the color to be named is 'yellow,' subjects will be quick to name it when the colored object is itself the word 'yellow'. This task is effortless, because subject don't need to identify the color.
 - Rather, they read the word, and reading is a fast and automated cognitive task.
 - When the color the subject must name is imbedded in a neutral object, like the letter 'X,' it will take them slightly longer to name that color. That is because they can no longer make use of that automated skill of reading.
 - And subjects do worse when there is interference, such as when the color differs from the semantic meaning of the word. For example, if the color to identify is 'yellow,' but the written word is 'blue' there is a disconnect between the color and the word. The subject must now suppress the automated function of reading and instead concentrate on identifying the color.
 - Patients with certain types of brain dysfunction have great difficulty suppressing the meaning of the word when attempting to identify the color of the word. Try this experiment on your own. Name the color of each of the following words.

Yellow	Red	Orange
Blue	Green	Purple

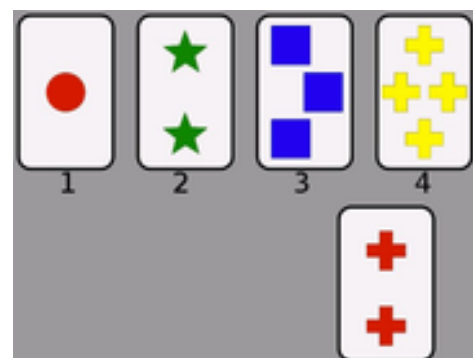
Now try it again on the words below. Name the color of each word.

Yellow	Red	Orange
Blue	Green	Purple

- The Stroop Test assesses cognitive flexibility, resistance to interference from outside stimuli, creativity, and psychopathology.
- Functional MRI studies using versions of the Stroop Test found that the anterior cingulate gyrus is activated during the test.

Wisconsin Card Sorting Test

- What: a test to assess frontal lobe function. In particular, it assesses the quality of abstract thinking and for the presence of perseveration
- Who: persons ages 6.5 to 89 years.
- When:
 - When frontal lobe impairment / executive dysfunction is suspected. When used as part of a more comprehensive test battery, the WCST helps discriminate frontal lobe from non-frontal lobe damage.
- Details
 - Administration: four different stimulus cards the size and shape of normal playing cards are laid before the subject on a table (or a computer screen). The subject is to match a response card (shown in the bottom row) to the stimulus cards during the test.
 - The four stimulus cards: differ along three variables: form, color, and number
 - First card: one red triangle
 - Second card: two green stars
 - Third card: three yellow crosses
 - Fourth card: four blue circles



- At the start of the test, the subject is given a deck of 64 or 128 response cards. The subject is asked by the examiner to match each response card to the stimulus card, forming four piles.
- The patient is not told the rules by which to sort the cards. The only feedback he receives from the examiner is whether he was "right" or "wrong" after each card placement.
- In the sample illustration, the subject has a response card of two red crosses. He can choose to place it below the red circle stimulus card (if he chooses to sort by color), below the two green stars (if he chooses to sort by number), or below the four yellow crosses (if he chooses to sort by shape). Whichever stimulus card the subject chooses to place his response card below, the examiner will provide the "right/wrong" feedback. The subject tries again with the next response card.
- The subject's task is to learn the card sorting rule based on the "right/ wrong" feedback. The subject demonstrates whether or not, and how fast and consistently he learns the sorting rule, whether the sorting rule is by form, color, or number.
- After a certain number of trials, the examiner changes the sorting rules. For instance, at one point, the rule may be to sort by number. It then changes abruptly to sort by color. The subject demonstrates his ability to adjust to the changing of the rules by how well and quickly he changes his sorting strategy.
- Perseveration is demonstrated by a patient who continues to sort according to one rule, color for instance, even after the examiner repeatedly tells him "wrong."
- Perseveration is an inability to "shift set" (change sorting strategies) even when the current strategy continues to result in failure.
- Patients with frontal lobe dysfunction demonstrate these set-shifting and abstract thinking deficits. Patients with Pick's Disease, for example, show dramatic deficits. Children with ADHD also show deficits as compared to peers without a ADHD diagnosis, although their deficits are not as dramatic.
- In addition to an overall score, scores are generated in the following categories.
 - Inefficient initial conceptualization
 - Perseveration
 - Failure to maintain a cognitive set
 - Inefficient learning across stages of the test

ADHD Rating Scales

ADHD Rating Scales can be used to establish a base prior to beginning therapy and then to monitor treatment effectiveness and changes over time. Some scales assess core ADHD symptoms only whereas others additionally assess comorbid behaviors.

Conners Rating Scales Revised

- What: multidimensional scales that help assess ADHD and comorbid disorders with links to DSM-IV diagnostic categories.
- Who: children ages 3-17 for parent and teacher versions, and adolescents ages 12-17 for adolescent self-report
- Details: available in three versions, as both long (15-20 minutes) and short (5-10 minutes) formats
 - Parent, Teacher, Adolescent Self-Report
 - Provides a perspective of the child's behavior from those who interact with the child on a daily basis

Inattention/Overactivity With Aggression (IOWA)

- What: The IOWA Conners Teacher Rating Scale is a 10-item scale developed to separate inattention and overactivity ratings from oppositional defiance and aggression
- Who: children with a clinical presentation of both inattention /overactivity and oppositional / defiance. The IOWA can be used to monitor treatment response.

Vanderbilt ADHD Diagnostic Parent & Teacher Scales

- What: assessment of ADHD, as well as symptoms of the following
 - Oppositional Defiant Disorder
 - Conduct Disorder
 - Anxiety and depressive disorders
- Who: children with ADHD, oppositional, defiant, aggressive, and criminal behaviors.
- Details
 - Teachers rate 35 symptoms and 8 performance items measuring ADHD symptoms and the comorbid conditions listed above.
 - The parent version contains all 18 ADHD symptoms, with items assessing the listed comorbid conditions and performance.

Assessments of Attention

The following tests can be used in conjunction with the rating scales listed in the ADHD section. Note that rating scales are questionnaires that query for presence of behaviors and symptoms as observed in the patient's day to day functioning. Tests, on the other hand, require the patient to perform tasks that assess the cognitive function directly. Two common ones are listed below.

Conner's Continuous Performance Test

- What: visual performance test used to assess for ADHD and learning disorders
- Who: children ages 7-16 years.
- When: used in diagnosis and when assessing response of ADHD to medication treatment.
- Details
 - A computerized, 14-minute test
 - The subject must respond repeatedly to non-target figures and then inhibit response when the infrequently presented target figure appears.
 - Outcome variables include: number of Hits, Omission, Commission and Response Time

Test of Variables of Attention (T.O.V.A)

- What: visual performance test used to assess for ADHD
- Who: children and adults.
- When: used in diagnosis and when assessing response of ADHD to medication treatment.
- Details
 - A computerized, 23-minute (11 minutes for 4-5 year olds), non-language based, fixed interval, visual performance test
 - For use in the screening, diagnosis, and monitoring of treatment of children and adults with attention deficits.
 - T.O.V.A is particularly sensitive for identifying changes in attention between pretreatment and stimulant-treatment conditions.

Comprehensive Neuropsychological Batteries

Neuropsychological batteries are defined as a series of neuropsychological tests that are combined into a single extensive assessment tool. They measure neurological functioning or brain-behavior relationships globally as may be needed when assessing dementia or head/brain injury. Or they measure specific areas of cognitive functioning, such as impairments in memory, language, sustained attention, construction, or reasoning. The two most common comprehensive neuropsychological batteries are the Halstead-Reitan and the Luria-Nebraska.

Halstead Reitan Neuropsychological Battery (HRNB)

- What: a comprehensive battery of neuropsychological tests that assesses multiple cognitive functions.
- Who: three versions for persons ages 5-8, 9-14, and 15 years and older
- When: when a comprehensive cognitive assessment is indicated
- Details
 - HRNB consists of 10 scales that measure elements of memory, abstract thought, language, sensory-motor integration, perception, and motor dexterity.

- HRNB can accomplish the following five tasks
 - HRNB can comprehensively identify the nature and degree of cognitive impairment.
 - It highly discriminates between normals and persons with brain damage.
 - It also discriminates between persons with psychiatric conditions and those with brain damage.
 - Based on the pattern of impairment, it suggests etiology.
 - Especially with acute lesions, localization of brain damage can be accomplished. Thus, the HRNB can supplement physical exam and neuroimaging localization findings.

Luria-Nebraska Neuropsychological Battery (LNNB)

- What: a comprehensive battery of neuropsychological tests that assesses multiple cognitive functions. It is an alternative to the HRNB and assesses similar cognitive functions and has the same purposes.
- Who: persons age 13 years and older
- When: when a comprehensive cognitive assessment is indicated
- Details
 - LNNB consists of 11 scales. They are:
 - Reading
 - Writing
 - Arithmetic
 - Visual
 - Memory
 - Expressive Language
 - Receptive Language
 - Motor Function
 - Rhythm
 - Tactile
 - Intellectual
 - LNNB can accomplish five goals
 - LNNB can comprehensively identify the nature and degree of cognitive impairment.
 - It discriminates between normals and persons with brain damage.
 - It also discriminates between persons with psychiatric conditions and those with brain damage.
 - Based on the pattern of impairment, it can suggest etiology.
 - Especially with acute lesions, localization of brain damage can be accomplished. Thus, the LNNB can supplement physical exam and neuroimaging localization findings.

Psychological / Personality Assessments

Minnesota Multiphasic Personality Inventory, Version 2 (MMPI-2)

- What: a personality test to identify personality structure and psychopathology
- Who: adults and adolescents. When used with adolescents, a different version is used, the MMPI-A.
- When
 - Assess major symptoms of social and personal maladjustment.
 - Identify suitable candidates for high-risk public safety positions.
 - Support classification, treatment, and management decisions in criminal justice and correctional settings.
 - Give a strong empirical foundation for a clinician's expert testimony.
 - Assess medical patients and design effective treatment strategies, including chronic pain management.
- Details
 - Evaluate participants in substance abuse programs and select appropriate treatment approaches.
 - Support college and career counseling recommendations.
 - Provide valuable insight for marriage and family counseling.
- Exam Nugget
 - The MMPI can be used when malingering is suspected. Of course, no fully sensitive measures of malingering exist, but elevated scores on the F and Fb Validity scales can suggest malingering.

MMPI Clinical Scales

Number	Abbreviation	Description	What is Measured
1	Hs	Hypochondriasis	Concern with bodily symptoms
2	D	Depression	Depressive Symptoms
3	Hy	Hysteria	Awareness of problems and vulnerabilities
4	Pd	Psychopathic Deviate	Conflict, struggle, anger, respect for society's rules
5	MF	Masculinity/Femininity	Stereotypical masculine or feminine interests/behaviors
6	Pa	Paranoia	Level of trust, suspiciousness, sensitivity
7	Pt	Psychasthenia	Worry, Anxiety, tension, doubts, obsessiveness
8	Sc	Schizophrenia	Odd thinking and social alienation
9	Ma	Hypomania	Level of excitability
0	Si	Social	Introversion People orientation

MMPI Sample Validity Scales

Abbreviation	New in version	Description	Assesses
?	1	"Cannot Say"	Questions not answered
L	1	Lie	Client "faking good"
F	1	Infrequency	Client "faking bad" (in first half of test)
K	1	Defensiveness	Denial/Evasiveness
Fb	2	Back F	Client "faking bad" (in last half of test)

MMPI Sample Content Scales

Abbreviation	Description
Es	Ego Strength Scale
OH	Over-Controlled Hostility Scale
MAC	MacAndrews Alcoholism Scale
MAC-R	MAC-R MacAndrews Alcoholism Scale Revised
Do	Dominance Scale
APS	Addictions Potential Scale
AAS	Addictions Acknowledgement Scale
SOD	Social Discomfort Scale
A	Anxiety Scale
R	Repression Scale
TPA	Type A Scale
MDS	Marital Distress Scale

Thematic Apperception Test

- What: a common projective test of psychological function. It is based on the projective hypothesis which states that a subject, when faced with ambiguous stimuli, projects onto them his or her own psychological preoccupations, fears, conflicts or motivations.
- Who: most commonly used in adults but is still used with adolescents.
- When: The TAT continues to be used in the following circumstances:
 - Psychiatric assessment: can be used to uncover psychotic thought processes, such as paranoia, and personality disorders.
 - Psychoanalysis and psychodynamic therapy: can be used to uncover the subject's unacknowledged preoccupations, fears, conflicts, motivations, desires, and commonly used psychological defenses.
- Career planning: some career planners believe that the TAT can help persons seeking a new career gain insight into which careers they are most compatible with.
- Details
 - The TAT is a picture interpretation or story-telling test.
 - The subject is presented with a series of ambiguous pictures and is asked to tell a story about each one.
 - Common questions the subject is asked include:
 - What has led up to the event shown?
 - What is happening at the moment?
 - What the characters are feeling and thinking?
 - What is the outcome of the story?
 - Picture samples below

