LANGUAGE-BASED LEARNING DISABILITIES AND THE NEURO-PSYCHOLOGICAL EVALUATION

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OVERVIEW

- When is a neuropsychological evaluation recommended?
  - Signs/red flags
- Understanding the evaluations
  - Test scores
  - Cognitive/IQ testing
  - Other Testing
- Specific Disorders and Intervention
  - Language-Based Learning Disabilities
  - Non-Verbal Learning Disabilities
  - ADHD
- Remediation Programs and accommodations

When is a neuropsychological evaluation recommended?

- Notice a difficulty or behavior and…
  - You don't know what is causing it
  - Don't know if services are warranted
  - Don't know what could help
  - Don't know how to deal with it

Risk Factors

- Family history
- Injuries/illnesses affecting neurological development
- Chronic ear infections
- Parental substance abuse
- Poor prenatal medical care and nutrition
- Prenatal injury or delivery complications
- Exposure to environmental toxins such as lead or toxic mold
- Poverty
- Abuse and neglect
- Exposure to trauma

Early Signs

PRESCHOOL

- Slow vocabulary growth, difficulty finding the right word
- Speaks later, may have pronunciation problems
- Difficulty rhyming words
- Trouble learning numbers, alphabet, days of the week, colors, shapes
- May be restless and easily distracted
- May have trouble interacting with peers

Early Signs

PRESCHOOL (continued)

- Difficulty following directions or routines
- Fine motor skills develop slower than expected
- “Copy cats”
- Aggressive
- Clumsy
- Accident prone

Early Signs

ELEMENTARY SCHOOL

- Slow to learn the connection between letters and sounds
- Confuses basic words (*run*, *eat*, *want*)
- Makes consistent reading and spelling errors including letter reversals (*b*/*d*), inversions (*m*/*w*), transpositions (*felt*/*left*), and substitutions (*house*/*home*)
- Transposes number sequences and confuses arithmetic signs (+, -, x, /, =)
- Slow to remember facts

Early Signs

ELEMENTARY SCHOOL (continued)

- Slow to learn new skills, relies heavily on memorization
- Impulsive, difficulty planning
- Unstable pencil grip
- Trouble learning about time
- Poor coordination, unaware of physical surroundings, prone to accidents
- Difficulty sitting still

Late Signs (mostly LD)

MIDDLE/HIGH SCHOOL

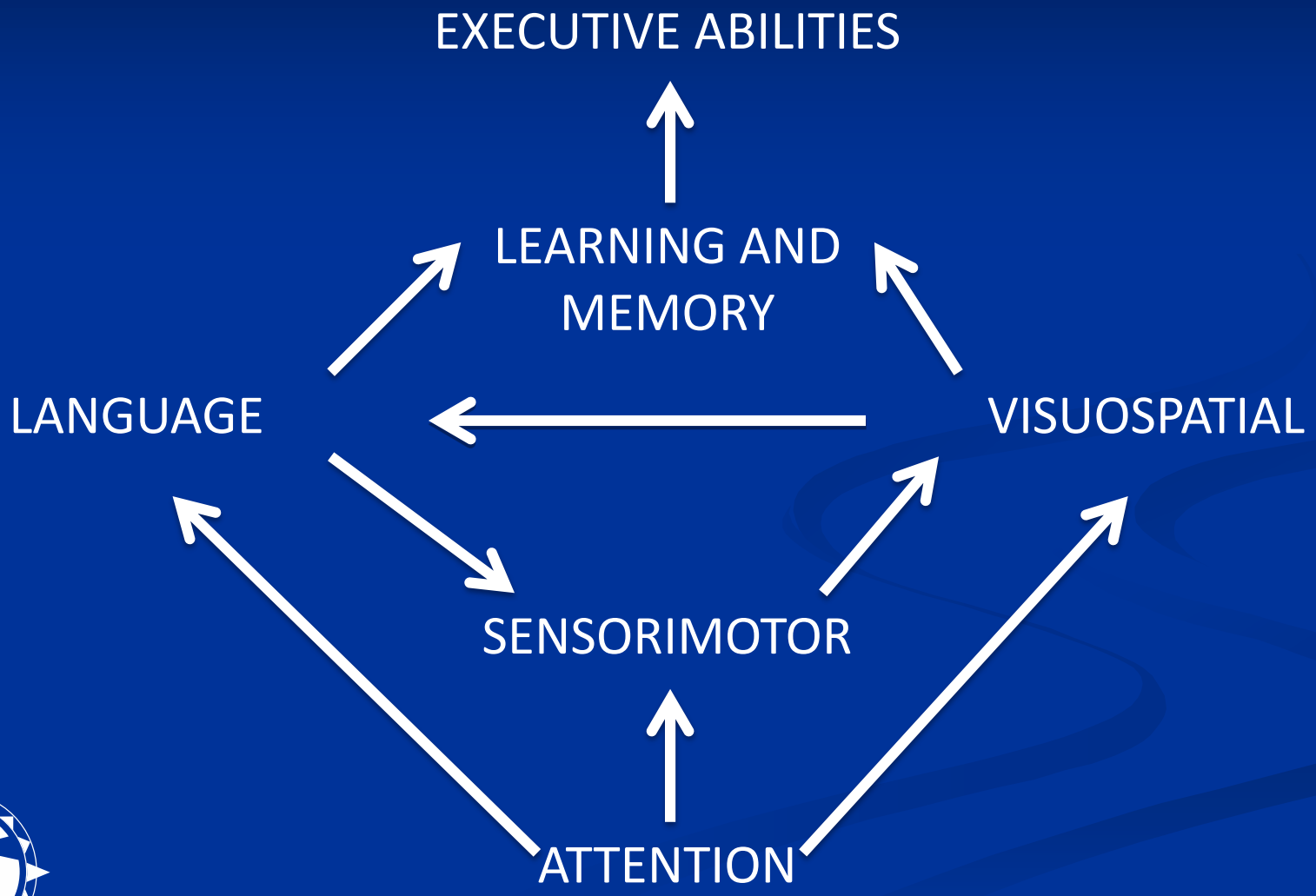
- Reverses letter sequences (*soiled/solid*, *left/felt*)
- Slow to learn prefixes, suffixes, root words, and other spelling strategies
- Avoids reading aloud, reading and writing assignments
- Trouble with word problems
- Difficulty with handwriting, awkward, fist-like, or tight pencil grip
- Works slowly
- Slow or poor recall of facts
- Poor grasp of abstract concepts

Late Signs (mostly LD)

MIDDLE/HIGH SCHOOL (continued)

- Either too little attention to details or too much
- Trouble summarizing
- Trouble with open-ended questions
- Misreads information/directions
- Difficulty working independently (without structure)
- Lower self-esteem, depression, anxiety
- Avoidance behaviors

Functional Organization of the Brain



Understanding the Evaluation

- To understand the evaluation, a basic understanding of scores is necessary

Understanding the Evaluation

- **Standard Scores (SDS)**
  - Most test scores can be expressed in SDS which allows comparison of performance across tests. The SDS has an average, (or mean), of 100, with a standard deviation of 15. Half of all individuals will obtain a SDS between 90 and 110, which are considered "average" scores.

Understanding the Evaluation

- **Subtest Scaled Scores (SS)**
  - A **SS** has a mean of 10 with a standard deviation of 3. Two-thirds of all individuals will obtain a SS between 7 and 13. SS between 8 and 12 are considered "average" because half of all individuals will fall within that range.

Understanding the Evaluation

- **Percentile Rank (PR)**
  - Represents the percentage of children in the typical group who scored lower than the child. For example, a PR of 58 tells you that 58 percent of the children in the typical group had scores lower than your child's score.

Understanding the Evaluation

- **Grade Equivalent (GE)**
  - Difficult to interpret but indicates how a child's performance compares to the performance of children in a particular grade in the normative sample for that test. For example, a child in grade 3.6 who scores a grade equivalent of 1.3 is performing as well as average children in the third month of the first grade on that test.

Understanding the Evaluation

- Neuropsychological Evaluation
  - Can establish a diagnosis (differential diagnosis, rule out certain conditions)
  - Determines if other evaluations are needed
  - Looks at the process in addition to scores
  - Guides interventions/accommodations

Understanding the Evaluation

- Neuropsychological Evaluation
  - History (medical, developmental, school, social, behavior)
  - Review of records
  - Behavior during testing/observations
  - Cognition/Intellectual skills
  - Sensorimotor and Visuospatial skills
  - Attention, Executive functioning, Memory
  - Language skills (screening and qualitative)
  - Educational evaluation (achievement)
  - Psycho-social screening

Understanding the Evaluation

- Cognitive testing (IQ)

- What does it mean?

  Look for discrepancies among Index scores (differences greater than 10 to 15 points)

Understanding the Evaluation

- Cognitive testing (IQ)
  - Usually Wechsler Intelligence Scale for Children

  ** previous WISC-IV, current WAIS-IV (ages 16+)
    - Full Scale (FS)
      - Verbal Comprehension Index (VCI)
      - Perceptual Reasoning Index (PRI)
      - Working Memory Index (WMI)
      - Processing Speed Index (PSI)

Understanding the Evaluation

- As of October 2014…..WISC-V
  - now with 5 indexes, including:
    - Verbal Comprehension Index (VCI)
    - Visual-Spatial Index (VSI)
    - Fluid Reasoning Index (FRI)
    - Working Memory Index (WMI)
    - Processing Speed Index (PSI)

Understanding the Evaluations

- **Cognitive testing (IQ), WISC-V**
  - **FSIQ made up of five INDEXES**
    - **1. VCI:** measures verbal abilities utilizing reasoning and conceptualization
      - Subtests: Similarities and Vocabulary

      (Comprehension & Information, optional subtests)
    - **2. VSI:** measures manipulation of visual-spatial information
      - Subtests: Block Design and Visual Puzzles

Understanding the Evaluations

- **WISC-V, Indexes**
  - **3. FRI:** measures inductive and deductive reasoning of nonverbal patterns
    - Subtests: Matrix Reasoning and Figure Weights (Picture Concepts & Arithmetic, optional subtests)
  - **4. WMI:** measures attention, concentration and the ability to actively maintain information in conscious awareness, perform some operation or manipulation with it and produce a result
    - Subtests: Digit Span and Picture Span (Letter-Number Sequencing, optional subtest)

Understanding the Evaluations

- **WISC-V, Indexes**
  - **5. PSI:** measures speed of mental and grapho-motor processing
    - Subtests: Coding and Symbol Search (Cancellation, optional subtest)

Understanding the Evaluation

- **Other Cognitive batteries:**
  - Differential Ability Scales (DAS)
  - Reynolds IQ test
  - Stanford Binet
  - Woodcock-Johnson cognitive battery
  - Kaufman Assessment battery for children
  - Cognitive Assessment System (CAS)
  - Test of Nonverbal Intelligence (TONI)

Understanding the Evaluation

- Visual-spatial Measures:

  - Motor Free Visual Perception
  - WISC picture completion
  - Hooper Visual Organization test
  - Block Design from WISC
  - Coding & Cancellation from WISC
  - Beery Visual Motor Integration test
  - Rey–Osterrieth Complex Figure Test (ROCF)

Understanding the Evaluation

- Sensorimotor Measures:

- Observation
- Many skills assessed by OT/PT
- May see dynamometer, pegboard, finger tapping

Understanding the Evaluation

- Assessing Memory:

  Wide Range Assessment of Memory and Learning (WRAML-2)

  California Verbal Leaning Test (CVLT)

  Children's Memory Scale (CMS)

  Working Memory from WISC (WMI)

Understanding the Evaluation

- Executive Function:

  Observations
  Timed tests (WISC)
  Concentration tests on WISC (Arithmetic, L/N)
  Trail making B
  Matrices
  Similarities, Block Design, Picture Concept (WISC)
  Wisconsin Card Sorting Test
  Complex Figure

Understanding the Evaluation

- Attentional Measures:
  - Computerized sustained attention
  - Visual (Coding, Symbol Search, Cancellation from WISC)
  - Letter cancellation
  - Trail Making
  - Fluency
  - Auditory (some memory tests including working memory)

Understanding the Evaluation

- Speech and Language:
  - Receptive

    Understanding words, sentences, and/or multiple meanings

    Auditory comprehension (simple and complex, following directions etc.)

Understanding the Evaluation

- Speech and Language
  - Expressive

    Vocabulary, verb tense use, word recall, production of sentences of appropriate length, organization and sequencing of thoughts in a logical manner for oral output

Understanding the Evaluation

- Typical Speech and Language tests:
  - CELF-5 (Clinical Evaluation of Language Fundamentals)
  - TLC-2 (Test of Language Competence)
  - CTOPP-2 (Comprehensive Test of Phonological Processing)
  - PPVT IV (Peabody Picture Vocabulary Test)
  - EVT II (Expressive Vocabulary Test)
  - CASL (Comprehensive Assessment of Spoken Language)
  - TOAL (Test of Adolescent Language)
  - OWLS (Oral and Written Language Scales)

Understanding the Evaluation

- Educational Measures:
  - Woodcock Johnson IV achievement (WJ-IV)
  - Wechsler Individual Achievement Test III (WIAT-III)
  - Kaufman Test of Educational Achievement

Understanding the Evaluation

- Reading
  - Phonological processing
  - Decoding (real words, nonsense words)
  - Fluency (rate and accuracy)
  - Comprehension

Understanding the Evaluation

- Written Expression
  - Spelling
  - Fluency
  - Text generation

Understanding the Evaluation

- Mathematics
  - Calculations
  - Fluency
  - Reasoning (word problems)

Understanding the Evaluation

- A battery usually needs to be supplemented by other tests
  - Reading Comprehension
    - Gates Maginitie
    - Nelson Denny
    - TORC-4
  - Reading (decoding and fluency)
    - GORT-5
    - CTOPP-2
    - WRMT-III
    - TOWRE

Understanding the Evaluation

- Psychosocial Measures:

  History

  Behavior Rating Scales, including:

    Behavior Assessment Scale for Children (BASC-2)

    Child Behavior Checklist (CBCL)

    Connors Rating Scales

Characteristics of Learning Disabilities

Problems with:

- Reading (decoding, fluency, and/or comprehension)
- Spoken language
- Written language
- Reasoning abilities (some aspects)
- Visual-spatial processing/ visual-motor integration
- Hyperactivity and/or attention
- Organizational skills

Types of Learning Disabilities

- Different ways of categorizing LD.

1. Language-Based LD (dominant hemisphere) vs Non-Verbal (non-dominant hemisphere) LD

Types of Learning Disabilities

2. DSM-V (medical terminology)
    - Developmental speech and language disorders
    - Academic skills disorders (reading, writing, mathematics)
    - "Other" a catch-all that includes certain coordination disorders and learning handicaps not covered by the other terms

Types of Learning Disabilities

3. Categorized based of processing problems

(auditory, language, visual-spatial, visual, phonological etc.)

Types of Learning Disabilities

- Language-Based LD (LBLD) VS Non-Verbal LD (NVLD):

  LBLD: Refers to a spectrum of difficulties related to the understanding of both spoken and written language. The number and severity of language difficulties individuals with LBLD experience vary widely.

Types of Learning Disabilities

- Typical areas of difficulty for individuals with LBLD:
  - Listening
  - Oral expression
  - Reading
  - Comprehension
  - Spelling
  - Written expression
  - Mathematics

Types of Learning Disabilities

- Specific diagnoses or "labels" for individuals with a LBLD may include:
  - Dyslexia
  - Reading Disability
  - Receptive/Expressive Language Disorder
  - Language Processing Disorder
  - Auditory Processing Disorder
  - Phonological Processing Disorder
  - Disorder of Written Language

Types of Learning Disabilities

- Language-Based LD (LBLD) VS Non-Verbal LD (NVLD):

  NVLD: Refers to a spectrum of difficulties related to the processing of visual-spatial information, intuitive, evaluative, organization and global reasoning. The number and severity of difficulties individuals with NVLD experience vary.

Types of Learning Disabilities

- Typical areas of difficulty for individuals with NVLD:
  - Weak visual spatial and visual discrimination abilities (affects spelling)
  - Poorly developed organizational skills (affects written expression)
  - Difficulty making inferences and reasoning abstractly (affects reading comprehension)
  - Significant problems with mathematical reasoning
  - Limited social competence
  - Often lack flexibility in thinking, approach tasks rigidly
  - Visual-motor/integration

Types of Learning Disabilities

- Specific diagnoses or "labels" for individuals with a NVLD may include:
  - Visual Processing Disorder
  - Visual-Spatial Processing Disorder
  - Motor Skills Disorder
  - Visual-Motor Integration Disorder
  - Learning Disability NOS
  - Disorder of Written Language

Language-Based LD:

- Stronger visual-spatial integration
- Higher scores on Fluid Reasoning Index of WISC
- Big picture thinker
- Stronger math reasoning ability
- Phonological based reading disability (Dyslexia)
- Receptive/Expressive Language Disorder
- Stronger reading comprehension vs. decoding ability
- Stronger social/pragmatic language skills
- Benefits from visual aids/templates and graphic organizers
- Does better with visual and kinesthetic domains

Common for both LBLD and NVLD:

- Disorder of written expression
- Math disorder
- Weakness with encoding/spelling
- Grapho-motor issues
- Weaker working memory and/or processing speed
- Executive function disorder
- ADHD

Non-Verbal LD:

- Stronger verbal abilities
- Weaker visual-spatial integration/fluid reasoning abilities
- Lower scores on Visual-Spatial/Fluid Reasoning index of WISC
- Weaker math reasoning ability
- Stronger decoding vs reading comp skills
- Weaker big picture thinking, hyper-focuses on the details
- “Hyper-verbal”, uses verbal mediation
- Weaker social/pragmatic language skills
- Struggles with visual templates that include maps and webs

Remediation and Accommodations for LBLD

- Formal Speech and language therapy
- Formal reading remediation
- For more impaired students, simple and concrete instructions, repetitions and visual cues
- Provide alternative means of expression (artwork)

Remediation/Accommodations

General Strategies/Teaching Methodologies for LBLD:

- Ensure all students have ample and equal opportunities to express their ideas
- Give students time to retrieve words and formulate their sentences without interruptions
- Use sound, letter, gestural, picture and meaning related cues to aid students when they are having word retrieval difficulties

Remediation/Accommodations

General Strategies/Teaching Methodologies for LBLD:

- Encourage students to use cues on their own to retrieve specific words or to learn vocabulary words
- Have students orally syllabicate and articulate unfamiliar multi-syllabic words
- Insist that students spell unfamiliar words phonetically on their own, and ask for correct spelling after

Remediation/Accommodations

General Strategies/Teaching Methodologies for LBLD:

- Simplify the syntax and make explicit the steps when giving directions (especially important when giving homework)
- Ask open-ended questions to encourage elaboration of information from the students

Remediation/Accommodations

General Strategies/Teaching Methodologies for LBLD:

- Use of graphic organizers (e.g., pictures, webs, maps, charts) to enhance reading comprehension, oral expression and writing skills
- Oral rehearsal prior to reading and writing tasks
- Incorporate visual and hands-on materials
- Provide structured study guides
- Provide structured proof-reading guidelines for writing assignments

Remediation

Remedial reading instruction programs may include:

- Decoding/encoding
  - Lindamood Phonemic Sequencing, LiPS
  - Orton-Gillingham
  - Wilson Reading Program

Remediation

- Fluency
  - Read Naturally
  - Great Leaps
- Comprehension
  - Lindamood Bell Visualizing and Verbalizing

Remediation

- Others
  - LEAD (Logical Encoding and Decoding)
  - Megawords
  - Vowel-Power
  - Fast Forward

Accommodations

- Extended time
- Class notes
- Assistive technology
- Reader
- Scribe for exams
- Answer in booklet

Attention Deficit Hyperactivity Disorder (ADHD)

- Common behavioral disorder that affects an estimated 8% to 10% of school-age children (boys about 3 times more likely than girls to be diagnosed). Used to be known as ADD till 1994 when re-named ADHD and broken down into three subtypes, each with its own pattern of behaviors:
  - Inattentive type
  - Hyperactive-impulsive type
  - Combined type

ADHD Types

- Inattentive type, with signs that include:
  - Inability to pay attention to details
  - Tendency to make careless errors in school work or other activities
  - Difficulty with sustained attention in tasks/play
  - Apparent listening problems
  - Difficulty following instructions
  - Problems with organization

ADHD Types

- Inattentive type, with signs that include:
  - Problems with organization
  - Avoidance or dislike of tasks that require mental effort
  - Tendency to lose things like toys, notebooks or homework
  - Distractibility
  - Forgetfulness in daily activities

ADHD Types

- Hyperactive-Impulsive type, with signs that include:
  - Fidgeting or squirming
  - Difficulty remaining seated
  - Excessive running or climbing
  - Difficulty playing quietly
  - Always seeming to be “on the go”
  - Excessive talking
  - Blurting out answers before hearing the full question
  - Difficulty waiting for a turn or in line
  - Problems with interrupting or intruding

ADHD Types

- Combined type, with signs that include:
  - A combination of the other two types
  - Most commonly diagnosed type of ADHD
  - Overall difficulty controlling behavior

Diagnosing ADHD

- According to the DSM-V:
  - A child must display behaviors from one of the three subtypes before age 7
  - These behaviors must be more severe than in other kids the same age
  - The behaviors must last for at least 6 months
  - The behaviors must occur in and negatively affect at least two areas of a child's life
  - Must NOT be linked to stress at home/school/trauma

Related Problems to ADHD

- ADHD is often times found in conjunction with other problems, called coexisting conditions. About two thirds of kids with ADHD have one. The most common coexisting conditions are:
  - Oppositional Defiant Disorder (ODD) and Conduct Disorder (CD)
  - Mood Disorder
  - Anxiety Disorder
  - Learning Disabilities

Treating ADHD

- In most cases, ADHD is best treated with a combination of behavior therapy and medication. Different types of medications that may be used to treat ADHD include:
  - Stimulants*
  - Non-stimulants
  - Antidepressants

Treating ADHD

- Behavioral therapy attempts to change behavior patterns by reorganizing a child's home and school environment, giving clear directions and setting up a system of consistent rewards for appropriate behavior and negative consequences for inappropriate ones.

Treating ADHD

- Examples for behavioral strategies that may help a child with ADHD include:
  - Create a routine
  - Get organized
  - Avoid distractions
  - Limit choices
  - Change your interactions with your child
  - Use goals and rewards
  - Discipline effectively
  - Help your child discover a talent

ADHD in the Classroom

- Other tips and strategies for ADHD students to experience classroom success include:
  - Reducing distractions, modifying assignments, allowing extended time, providing structured organizational tools, allowing headphones, giving positive teacher reinforcement, involving school counselor/psychologist/OT, providing frequent breaks/opportunity to move around

Questions?

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