READING DISORDERS

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DEFINITION

- According to NIH, ICD, DSM,
  - "It is a specific language based disorder with difficulties in single word decoding usually reflecting insufficient phonological processing.
  - These difficulties are often unexpected in relation to age, grade, and other cognitive and academic abilities.
  - They are not the result of generalized intellectual or sensory disability.
  - Dyslexia is manifested by variable difficulty often including reading, writing, and spelling."

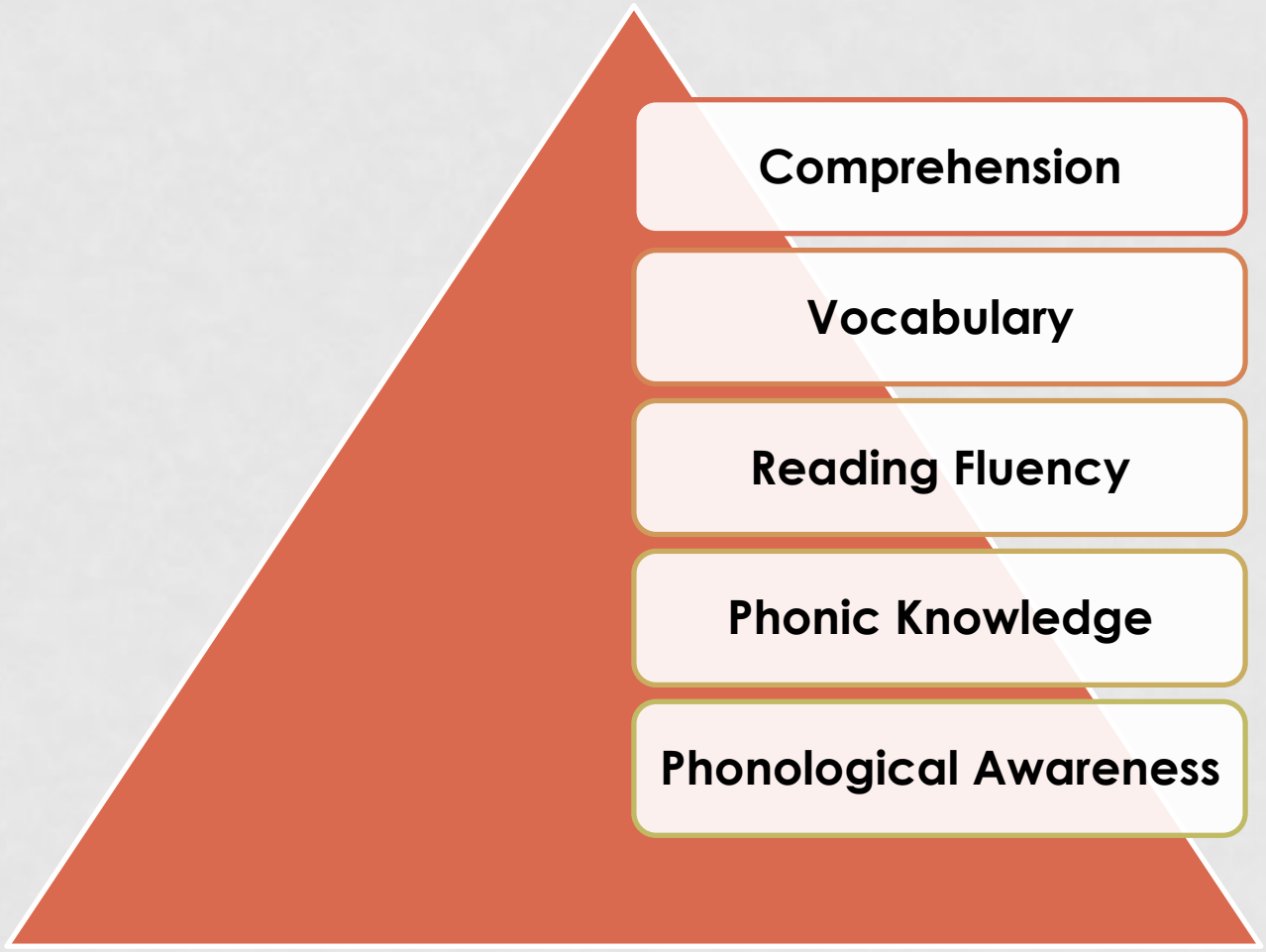
DYSLEXIA

- Biological basis caused by a congenital neurological condition
  - Abnormality in brain structure
  - Difference in function
  - Genetic factors
- Persists into adolescence and adulthood
- Has perceptual, cognitive and language based dimensions
- Can lead to difficulties in many areas of life

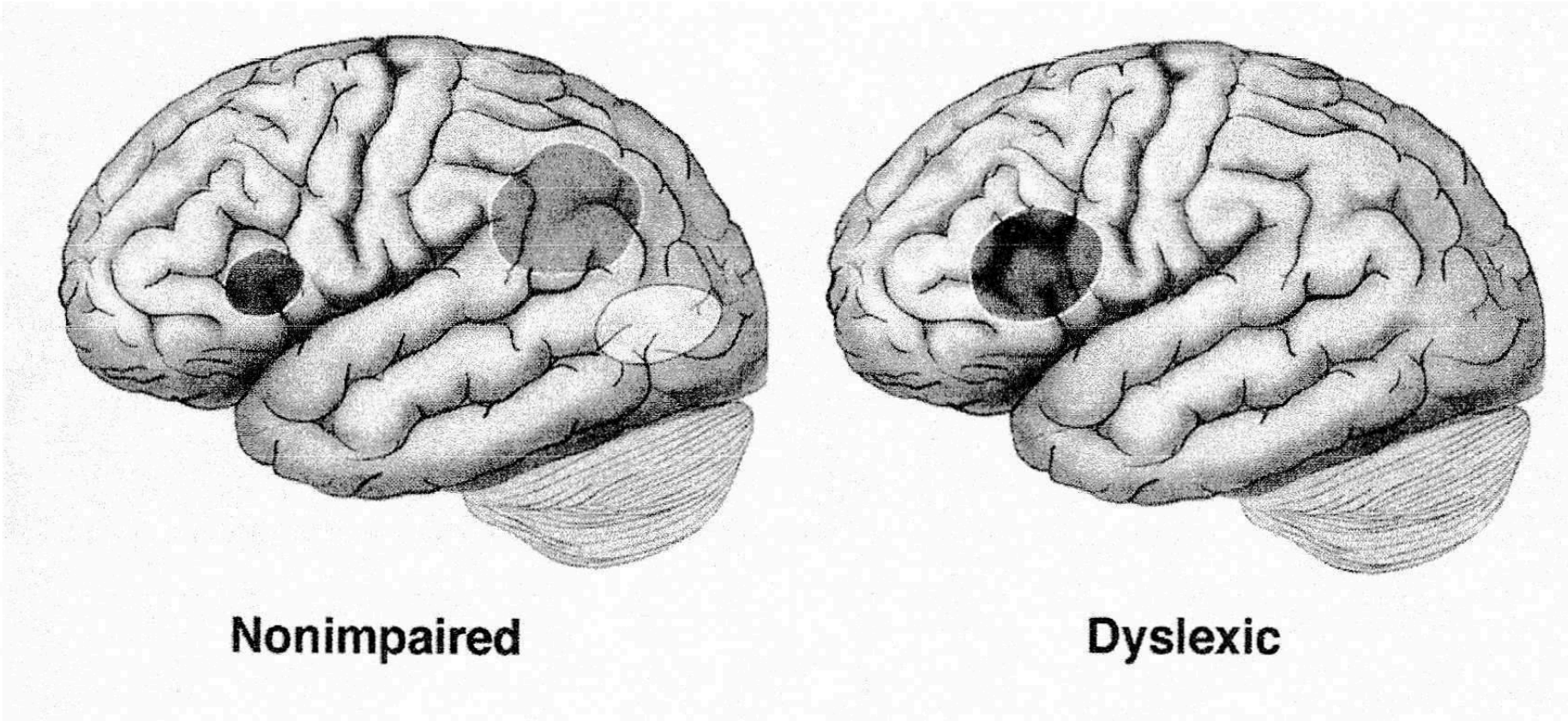
PREVALENCE

- 16-22% of the population
- About 10% are able to compensate in school and achieve academic benchmarks
- Generally equally as common in boys and girls
  - Girls tend to be overlooked
- Majority of students identified between 11-17

NATIONAL READING PANEL: 5 COMPONENTS



NEUROIMAGING STUDIES OF DYSLEXIA



CAUSES

- Linked to certain genes that control how the brain develops
- Runs in families

CHARACTERISTICS OF READING DISABLED CHILDREN

- Poor decoding skills
- Weak vocabulary development
- Inability to read strategically
- Poor spelling
- Few reading opportunities outside of school
- Poor motivation and confidence

SUBTYPES OF DYSLEXIA: *PHONOLOGICAL DYSLEXIA*

- Phonological Subtype
  - Difficulty using phonological route in reading; over-reliance on visual cues to determine meaning
- Surface Dyslexia
  - Also referred to as visual form dyslexia or dyseidetic dyslexia
  - Reading never becomes automatic; over-reliance on sound/symbol relationship
- Mixed Dyslexia
  - Characteristics of phonological and visual/spatial deficits
- Deep Dyslexia
  - Rare form of a reading comprehension disorder; difficulty reading words with abstract meanings

LOW INCIDENCE TYPES OF DYSLEXIA

- Hyperlexia – ability to decode words despite significant cognitive deficits, comprehension is poor
- Neglect Dyslexia – inability to read words on left side of a page; usually not a developmental dyslexia
- Wernicke's Dyslexia – inability to comprehend written material

HYPOTHESES

- Double Deficit Hypothesis → individuals with double deficits in phonological awareness and rapid automatized naming have more severe impairments than individuals with single deficits

- Matthew Effect → early achievement spawns faster rates of subsequent achievement (Stanovich, 1986)
  - Children who struggle with vocabulary early on read less and have slower vocabulary development which inhibits subsequent growth in reading abilities

DEVELOPMENTAL READING MILESTONES: RED FLAGS

- Preschool Years:
  - Speech and language delays
  - Inability to distinguish rhymes
  - Failure to recognize letters in name
  - Mispronounce words
  - Trouble remembering letters, numbers, days of week
- Kindergarten & 1st Grade:
  - Inability to associate letters with sounds
  - Difficulty recognizing the order of sounds in words
  - Difficulty reading common one-syllable sight words
  - Inability to segment words by syllables

DEVELOPMENTAL READING MILESTONES: RED FLAGS

- 2nd & 3rd Grades:
  - Failure to read at least 40 words per minute
  - Slow progress in acquiring basic reading skills
  - Working at least one grade below level
  - Over-reliance on context to derive meanings from print
  - Slower paced and effortful reading
  - Confuse words that sound alike
- Secondary Grades:
  - Inability to read at least 60 words per minute
  - Poor fluency skills
  - Extreme spelling difficulties
  - Fear of reading out loud

LETTER REVERSALS

- Common until age 7
- Not necessarily a sign of dyslexia
- Don't hesitate to address it at home
- Seeing letters float on page
  - Actually a problem with decoding
  - Scanning differences
- Visual issues are separate but can co-occur

STRENGTHS

- Out of the box thinking
- Overrepresented in top artists, scientists, and executives
- Often skilled problem solvers

- Famous dyslexics
  - Thomas Edison
  - Tom Cruise
  - Jay Leno
  - Agatha Christie
  - Walt Disney
  - Whoopi Goldberg

WHAT CAN YOU DO

- Get tested
- Create an IEP
- Get in home help
- Monitor progress
- Boost strengths
- Educate yourself to become your child's advocate

5 PITFALLS OF APTITUDE/ACHIEVEMENT DISCREPANCIES

1. There is no universal agreement on what the discrepancy should be
2. It is unclear as to which IQ score should be used to establish a discrepancy
3. A discrepancy model of reading disabilities precludes early identification
4. Intelligence is more a predictor of school success, not a predictor of successful reading
5. A discrepancy model promotes a "wait and fail" policy forcing intervention to come after the fact

EFFECTIVE RTI MODEL

1. **Universal Screening** – for all students a minimum of 3 times per year
2. **Baseline Data** – using curriculum-based measurement as primary data gathering means
3. **Measurable Terms** – define problem areas numerically
4. **Accountability Plan** – monitor fidelity of selected intervention
5. **Progress Monitoring –** how, where, and when intervention results will be measured and recorded
6. **Data Based Decision Making** – ongoing analysis of data to drive future intervention decisions

THEORETICAL DEVELOPMENT & APPLICATION

THE NEUROPSYCHOLOGICAL EXAMINATION

- The neuropsychological examination is a means to gather objective data regarding an individual's specific cognitive abilities.
- The purpose of the neuropsychological examination is to evaluate each patient's brain rather than each patient's complaints.
- Neuropsychological tests are different than intellectual or achievement tests. (How we differ from psychoeducational testing).
- The term neuropsychological clearly involves both the neurological and psychological points of reference with the neuropsychological test being one that establishes a relationship between the biological and the behavioral aspects of the brain. Standardization samples are significantly different.

THEORETICAL DEVELOPMENT & APPLICATION

THE MEASUREMENT STRATEGIES INVOLVE FOUR INFERENTIAL APPROACHES:

A. General level of performance or how well the subject performed on each of the measures in the battery. This is represented by normal probability distribution for non-brain damaged subjects. Subjects can perform quite well and others perform poorly depending on above average abilities or nature of cerebral damage, or below average intelligence. Most common form of neuropsychological interpretation.

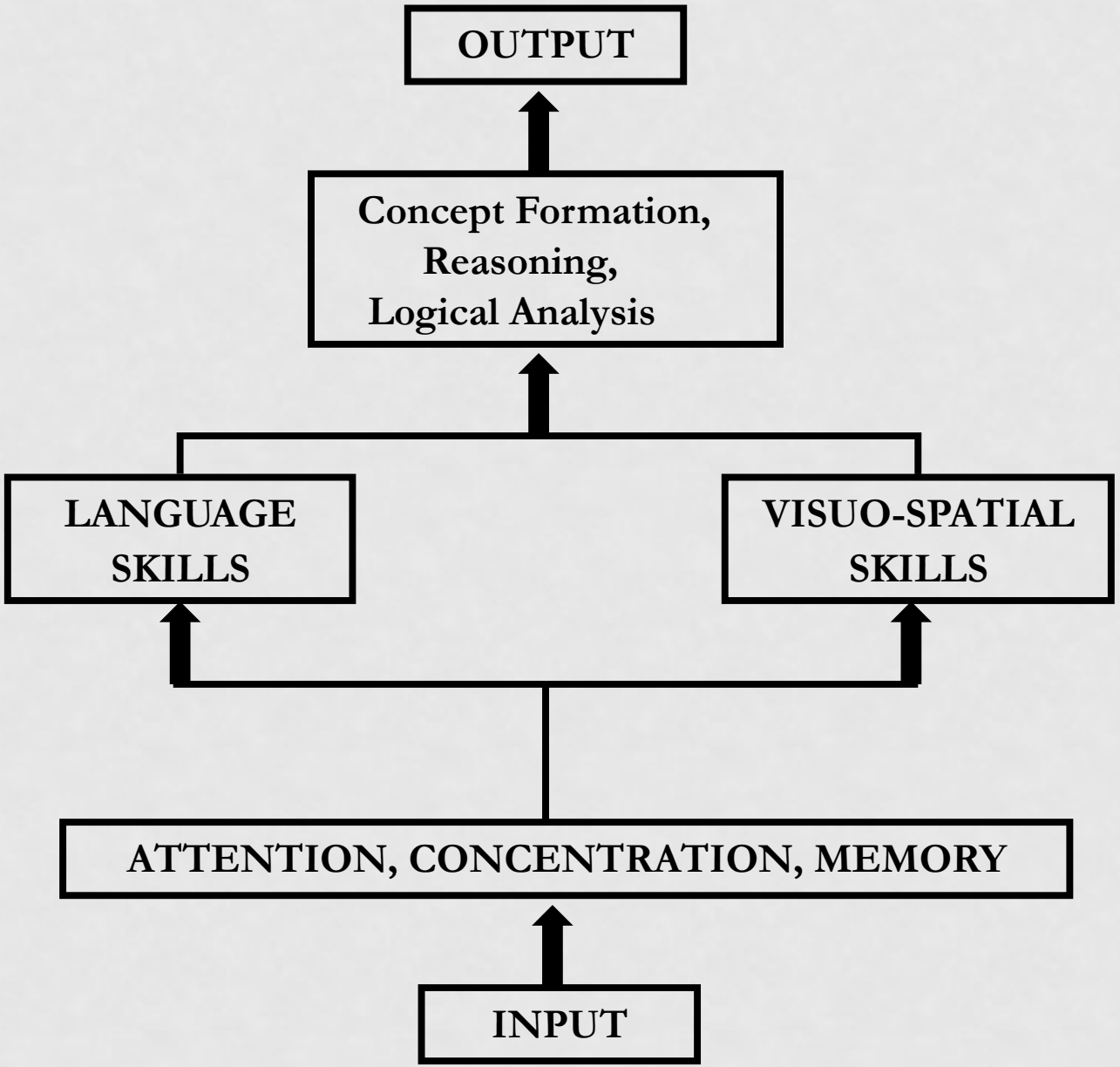
B. Pathognomonic approach where specific deficits are noted that occur almost exclusively among neurologically impaired patients

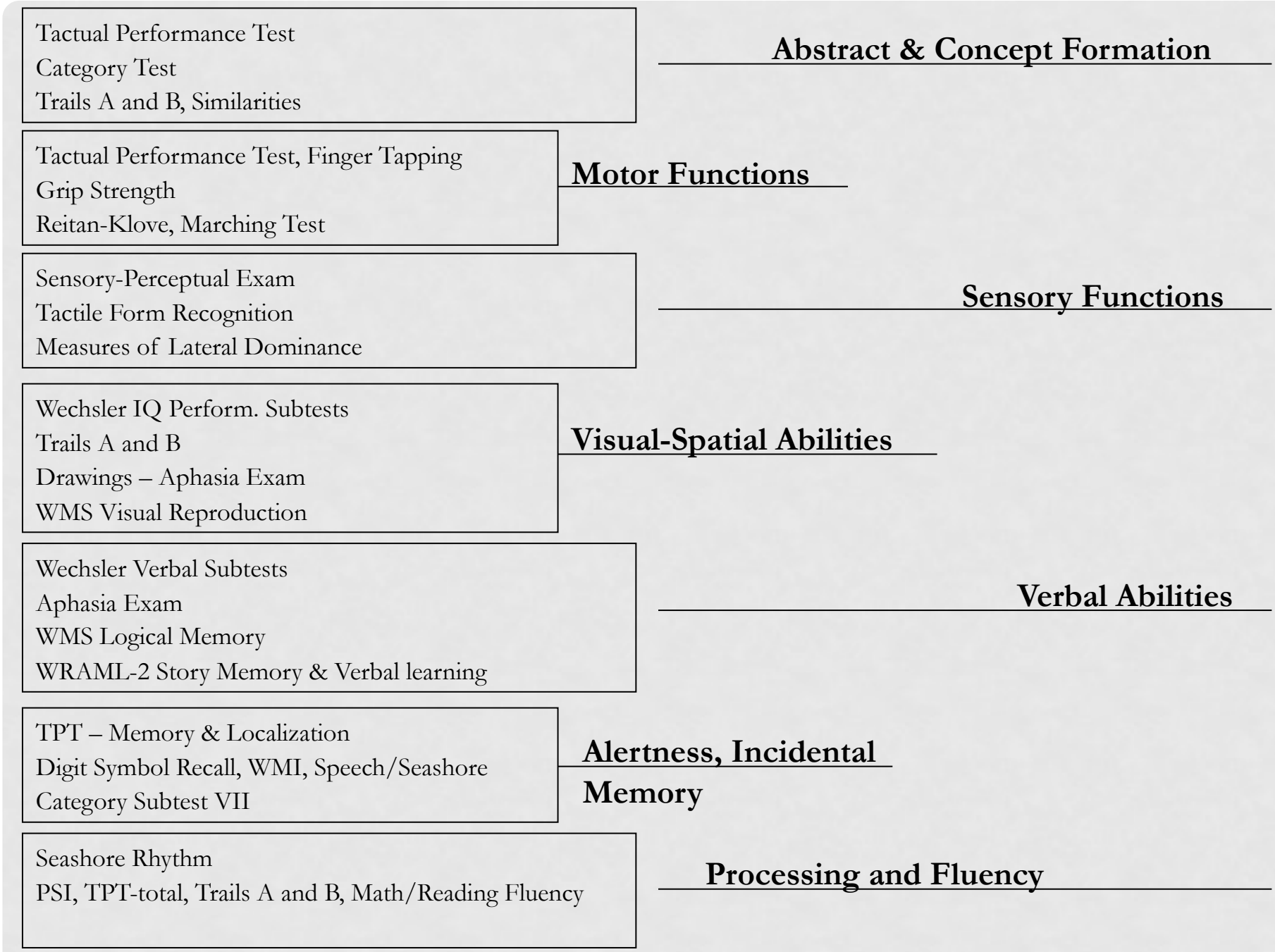
C. Lateralizing Indicators comparing motor and sensory/perceptual performances using the patient as his/her own control.

D. Pattern of cognitive findings. This represents an intraindividual comparison procedure whereby the subject's own performances are analyzed relative to one another, thereby helping to identify the uniqueness of a patient's ability and it's relation to different types of brain profiles.

WHAT DOES THE NPE ASSESS?

- A typical NPE assesses these areas
  - General Intellect
  - Achievement Skills (i.e. Math, Spelling, Reading, etc.)
  - Higher Order Cognitive Skills (i.e. organization, planning)
  - Attention
  - Processing speed/cognitive flexibility of thinking
  - Learning & Memory
  - Language
  - Visual-spatial Skills
  - Motor Coordination
  - Behavioral and Emotional Functioning


OUTPUT
Concept Formation,
Reasoning,
Logical Analysis
LANGUAGE
SKILLS
VISUO-SPATIAL
SKILLS
ATTENTION, CONCENTRATION, MEMORY
INPUT


Tactual Performance Test
Category Test
Trails A and B, Similarities
Abstract & Concept Formation
Tactual Performance Test, Finger Tapping
Grip Strength
Reitan-Klove, Marching Test
Motor Functions
Sensory-Perceptual Exam
Tactile Form Recognition
Measures of Lateral Dominance
Sensory Functions
Wechsler IQ Perform. Subtests
Trails A and B
Drawings – Aphasia Exam
WMS Visual Reproduction
Visual-Spatial Abilities
Wechsler Verbal Subtests
Aphasia Exam
WMS Logical Memory
WRAML-2 Story Memory & Verbal learning
Verbal Abilities
TPT – Memory & Localization
Digit Symbol Recall, WMI, Speech/Seashore
Category Subtest VII
Alertness, Incidental Memory
Seashore Rhythm
PSI, TPT-total, Trails A and B, Math/Reading Fluency
Processing and Fluency

PROPERTY OF N.R.S.

RESULTS OF NEUROPSYCHOLOGICAL EXAMINATION (9-14)

PATIENT: J.R.G AGE: 11 SEX: F EDUCATION: 5 HANDEDNESS: R

ACCIDENT DATE: ___/___/___ TESTING DATE: ___/___/___

WECHSLER IQ SCALE (WISC-V)

FSIQ 116 % tile 87 %

VCI	120	90 %
VSI	118	88 %
FRI	89	24 %
WMI	88	22 %
PSI	98	34 %

VOCABULARY	14
INFORMATION	15
SIMILARITIES	12
BLOCK DESIGN	13
VISUAL PUZZLES	14
MATRIX REASONING	8
FIGURE WEIGHTS	9
DIGIT SPAN ( )	7
PICTURE SPAN	8
SYMBOL SEARCH	9
CODING	8
PAIRING	0 %

MEMORY/LEARNING (WRAML-2)

	IMMED	DELAY	RECOG
STORY MEMORY	13	12	11
VERBAL LEARNING	12	11	12

VISUAL/MOTOR

	SS	%	AE
VMI			
VISUAL			
MOTOR			

HALSTEAD-REITAN NEUROPSYCHOLOGICAL TEST BATTERY:

CATEGORY TEST (M-) 57

TACTUAL PERFORMANCE TEST

RIGHT HAND: 5'08" TOTAL TIME: 13'08"
LEFT HAND: 4'22" MEMORY: 3
BOTH HANDS: 4'00" LOCALIZATION: 1

SEASHORE RHYTHM:
NUMBER CORRECT: 22

SPEECH-SOUNDS PERCEPTION TEST
NUMBER INCORRECT: 9

FINGER OSCILLATION TEST
DOMINANT HAND: 44
NON-DOMINANT HAND: 37

TRAIL MAKING TEST
PART A: 14 sec ___ errors
PART B: 57 sec ___ errors

GRIP STRENGTH
DOMINANT HAND: 18
NON-DOMINANT HAND: 16

REITAN-KLOVE SENSORY PERCEPTUAL
RH ___ LH ___ BOTH H: RH ___ LH ___
RH ___ LF ___ BOTH HF: RH ___ LF ___
LH ___ RF ___ BOTH HF: LH ___ RF ___ 0/20
RE ___ LE ___ BOTH E: RE ___ LE ___
RV ___ LV ___ BOTH V: RV ___ LV ___

TACTILE FINGER RECOGNITION 0/20
R 1___ 2___ 3___ 4___ 5___
L 1___ 2___ 3___ 4___ 5___

FINGER TIP WRITING 0/20
R 1___ 2___ 3___ 4___ 5___
L 1___ 2___ 3___ 4___ 5___

HALSTEAD-REITAN NEUROPSYCHOLOGICAL BATTERY:

NEUROPSYCHOLOGICAL DEFICIT SCALE (NDS)
SUMMARY
General NDS
- Level of Performance ___
- Pathognomonic Signs ___
- Patterns ___
- Right/Left Differences ___
- Impairment Index ___

Total GNDS Score ___

APHASIA INDICATORS

CRUSS "Cross"
SQURE "SQUARE"

~~VISUAL SPATIAL INDICATORS~~

Worning "warning"

ACHIEVEMENT TEST (WIAT-III)

	SS	%	AE
WORD READING	60	1	1.5
PSEUDOWORD	76	5	1.8
READING COMP	78	3	1.6
SPELLING	73	4	1.7
ORAL READ FLUENCY	81	5	1.6
ORAL EXPRESSION			
LISTENING COMP			
NUMERICAL OPS	98	60	5.0
MATH PROB-SOLVING	96	55	4.8
MATH FLUENCY			
ADDITION	89	48	4.7
SUBTRACTION	90	50	4.9
MULTIPLICATION	90	50	4.9

ADDITIONAL TESTS

WHAT CAN YOU DO

- Get tested
- Create an IEP
- Get in home help
- Monitor progress
- Boost strengths
- Educate yourself to become your child's advocate

INTERVENTION

- Remediation
- Accommodation

ACCOMMODATION

- Reduce language arts homework
- Provide outlines of notes
- Read test questions/instructions aloud
- Text on child's reading level
- Repetition of new words
- Reduce # of spelling words
- Scribe
- Testing accommodations
- Don't penalize for spelling errors
- **Technology**

REMEDIATION

- Specialized instruction with targeted intervention in reading through school
  - Often based on Orton-Gillingham
    - Fundations
    - Wilson
    - Barton
- In home tutoring
- Build vocabulary
- Read, Read, Read
  - Watch movies with subtitles
  - Take turns reading together
  - Hi-Low books
- Make it fun/multisensory

STRENGTHS BASED APPROACH

- Use child's interests and strengths to motivate him/her
- Multiple ways of completing an assignment
- Hands on/multisensory
- Encourage out of the box thinking