ASSESSING FOR DYSLEXIA

WHAT AND HOW TO PROFILE/DIAGNOSE DYSLEXIA

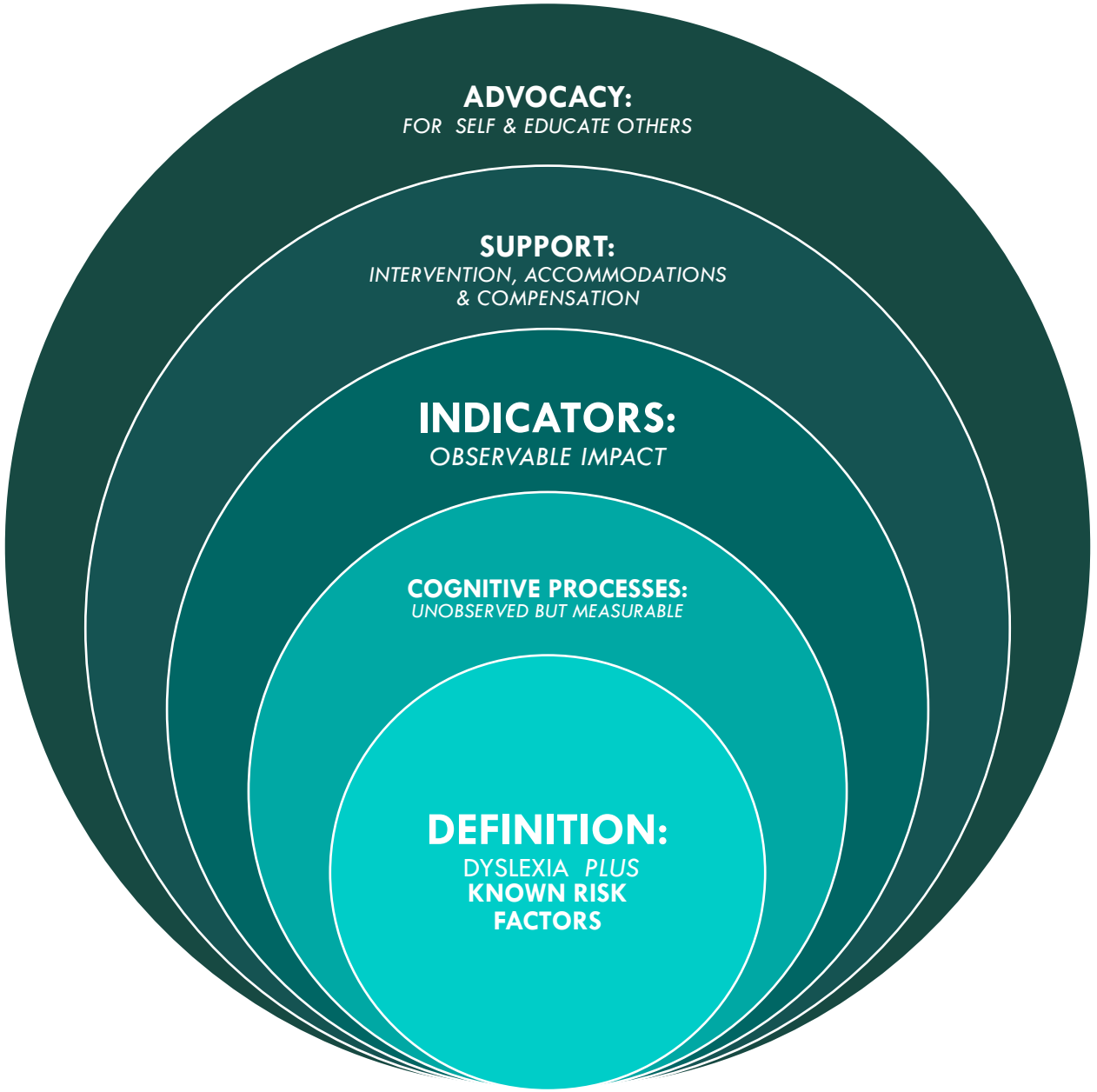
OUTCOMES

SESSION 1:

- WHY STUDY DYSLEXIA?
- OVERVIEW OF HOW READING DEVELOPS
- HOW THE CHILD WITH DYSLEXIA DIFFERS FROM THE TYPICALLY DEVELOPING READER
- THREE WIDELY USED DEFINITIONS, RISK FACTORS AND THEIR IMPLICATIONS FOR PROFILING/DIAGNOSING DYSLEXIA

SESSION 2:

- A FRAMEWORK FOR UNDERSTANDING DYSLEXIA TO INFORM PROFILING/DIAGNOSTIC ASSESSMENT
- THE WHAT AND HOW-TO PROFILE/DIAGNOSE DYSLEXIA


ADVOCACY:
FOR SELF & EDUCATE OTHERS
SUPPORT:
INTERVENTION, ACCOMMODATIONS
& COMPENSATION
INDICATORS:
OBSERVABLE IMPACT
COGNITIVE PROCESSES:
UNOBSERVED BUT MEASURABLE
DEFINITION:
DYSLEXIA PLUS
KNOWN RISK
FACTORS

WHAT IS DYSLEXIA?

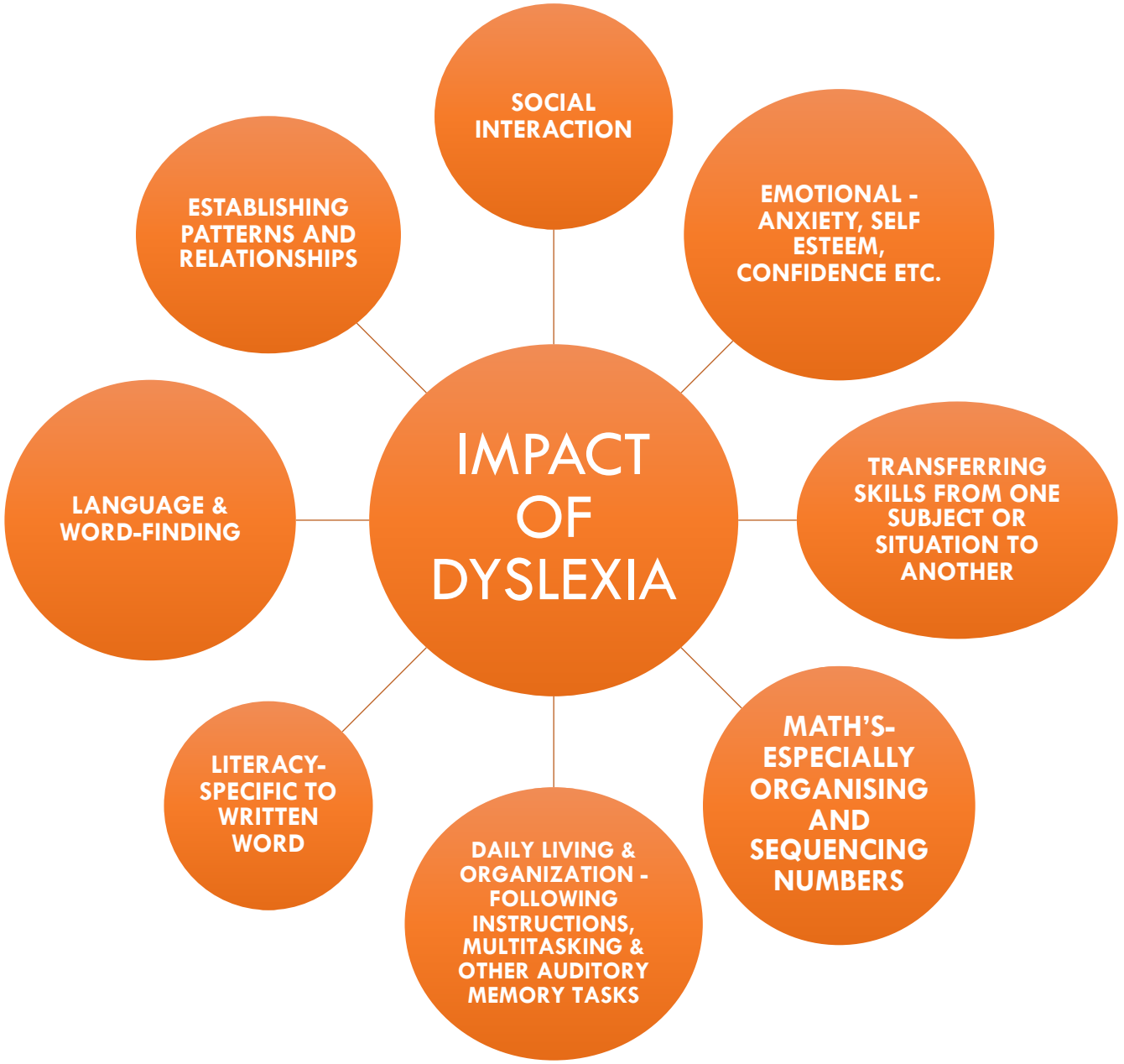
- IT IS A SPECIFIC LEARNING DIFFICULTY.
- THE CHILD STRUGGLES WITH ACCURATE AND/OR FLUENT READING.
- EXISTS WITH OTHER ASSETS.
- HAS HAD OPPORTUNITY FOR EFFECTIVE CLASSROOM TEACHING.

WHY STUDY DYSLEXIA?

- THE MOST COMMON LEARNING DIFFICULTY
- INTERNATIONALLY, PREVALENCE RATE FOR DYSLEXIA IS 10 TO 15 % OF WHICH 4% IS SEVERELY AFFECTED (BDA 2010, DSM V, WOLF)
- TRANSLATE THIS PREVALENCE RATE FOR SOUTH AFRICA PRIMARY SCHOOLS WITH ESTIMATED 7,6 MILLION LEARNERS IN PUBLIC AND INDEPENDENT SCHOOLS FROM GRADE R TO GRADE 7, EXCLUDING COMMUNITY ECD SITES AND SPECIAL SCHOOLS
- PROGRESS IN INTERNATIONAL READING AND LITERACY STUDY (PIRLS 2016):
  - 78% GRADE 4 ACROSS ALL 11 OFFICIAL LANGUAGES COULD NOT REACH LOWEST BENCHMARK FOR READING COMPREHENSION.
  - THE AVERAGE CHILD IN THE POOREST 75% OF SCHOOLS HAS 5 TIMES HIGHER PROBABILITY OF NOT LEARNING TO READ THAN OF LEARNING TO READ (SPAULL AND PRETORIUS, 2019)

WHY STUDY DYSLEXIA?

- RATIO OF BOYS TO GIRLS, NO ASCERTAINMENT BIAS 2:1 TO 3:1 (DSM V)
- GREATER SEVERITY IN BOYS THAN GIRLS
- ADHD CO-EXISTS 30-50% WITH DYSLEXIA
- GENETIC RISK – INCREASES CHANCE FOUR-FOLD IF A PARENT OR SIBLING IS DYSLEXIA (WAGNER, 2018)


IMPACT OF DYSLEXIA
SOCIAL INTERACTION
EMOTIONAL - ANXIETY, SELF ESTEEM, CONFIDENCE ETC.
TRANSFERRING SKILLS FROM ONE SUBJECT OR SITUATION TO ANOTHER
MATH'S- ESPECIALLY ORGANISING AND SEQUENCING NUMBERS
DAILY LIVING & ORGANIZATION - FOLLOWING INSTRUCTIONS, MULTITASKING & OTHER AUDITORY MEMORY TASKS
LITERACY- SPECIFIC TO WRITTEN WORD
LANGUAGE & WORD-FINDING
ESTABLISHING PATTERNS AND RELATIONSHIPS

WHY UNDERSTAND HOW READING DEVELOPS?

"ANY WELL-FOUNDED EDUCATIONAL INTERVENTION MUST BE BASED ON A SOUND THEORY OF THE CAUSES OF A PARTICULAR FORM OF LEARNING DIFFICULTY WHICH IN TURN MUST BE BASED ON AN UNDERSTANDING OF HOW A GIVEN SKILL IS LEARNED IN TYPICALLY DEVELOPING CHILDREN."

SNOWLING AND HULME (IN KILPATRICK 2015:247)

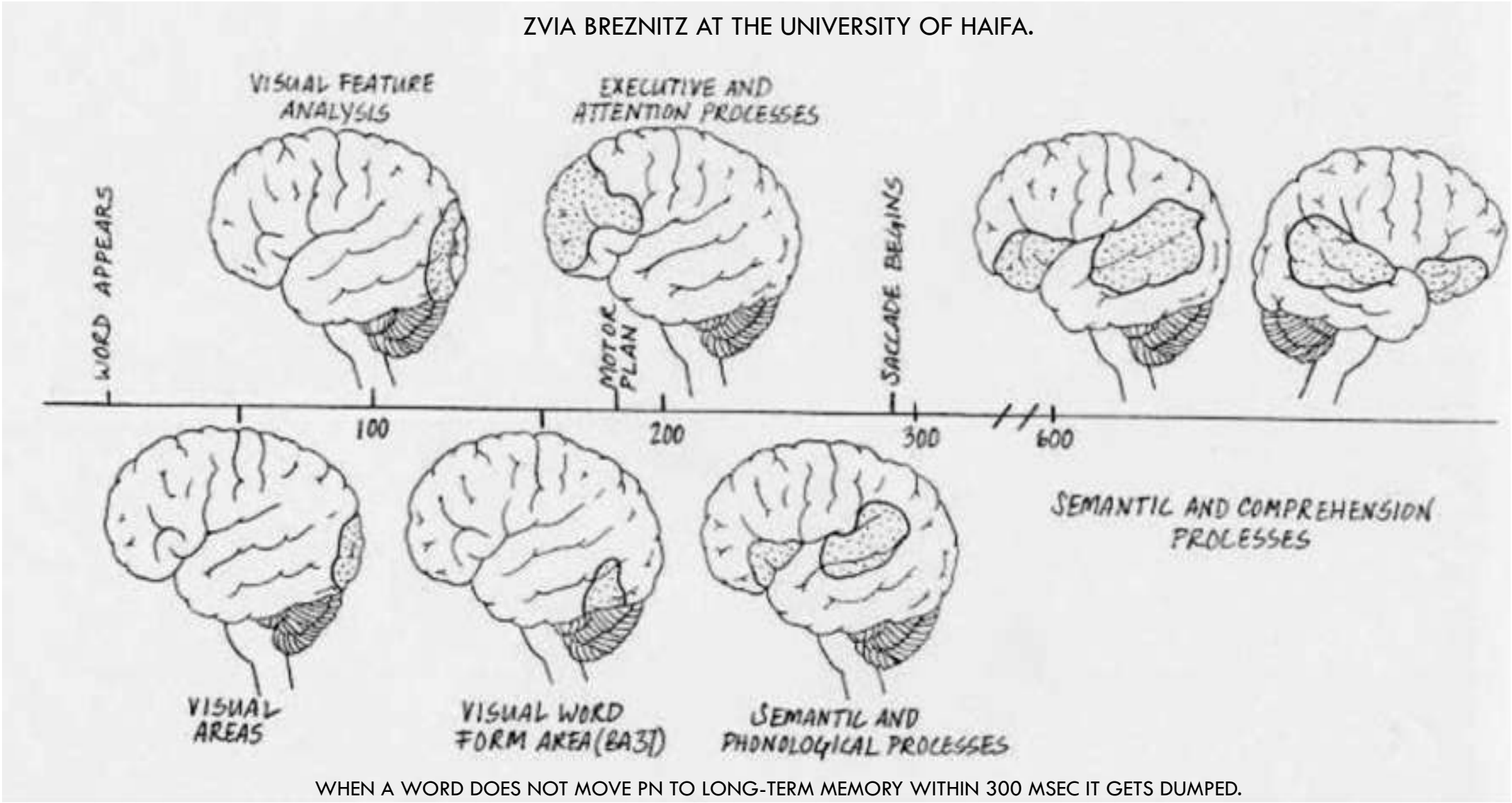
WHAT ARE THE SKILLS INVOLVED IN READING?

HOW DO WE READ ?

AOCCDRING TO RSCHEEARH AT CMABRIGDE UINERVTISY, IT DEOSN'T MTTAER WHAT OREDR THE LTTEERS IN A WROD ARE, THE ONLY IPRMOETNT TIHNG IS TAHT THE FRIST AND LSAT LTTEER ARE AT THE RGHIT PCLAE.THE RST CAN BE A TATOL MSES AND YOU CAN STILL RAED IT WOUTHIT A PORBELM. THIS IS BCUSEAE WE DO NOT RAED ERVEY LTETER BY ITSELF BUT THE WROD AS A WLOHE. SEIDENBERG 2017:88

“400 /450 MILLISECOND RULE” (WOLF)

ZVIA BREZNITZ AT THE UNIVERSITY OF HAIFA.



WHEN A WORD DOES NOT MOVE PN TO LONG-TERM MEMORY WITHIN 300 MSEC IT GETS DUMPED.

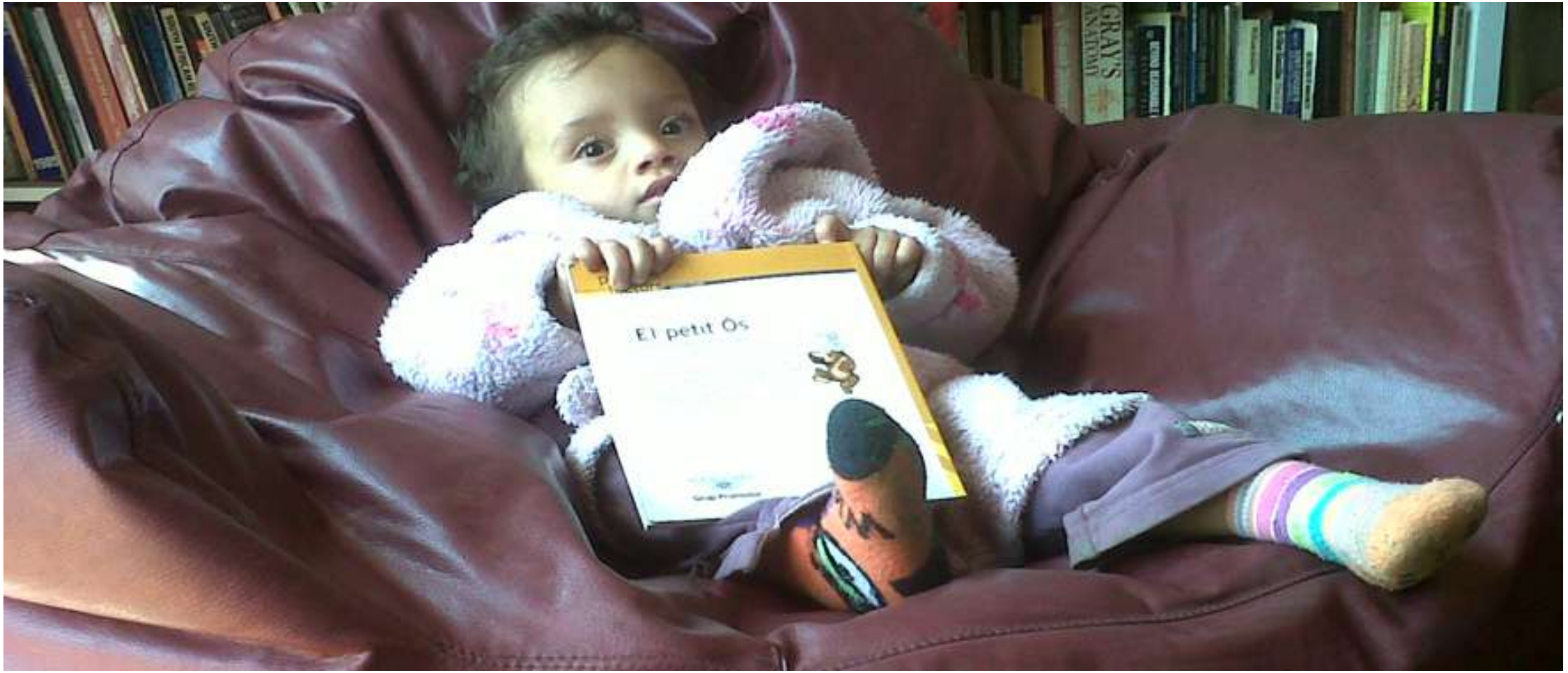
WHEN WORD MEANING KICKS IN…

- MEANING IS DERIVED BY ACTIVATING BOTH LEFT AND RIGHT HEMISPHERE.
- NEURONS IN RIGHT HEMISPHERE ARE BROADLY TUNED, LONGER BRANCHES AND MORE DENDRITIC SPINES ALLOWS FOR INTEGRATING INPUT ACROSS LARGER AREAS OF THE BRAIN BILATERALLY (WOLF)
- VISUAL AND PHONOLOGICAL PROCESSING ARE MORE WELL SUITED TO NEURONS OF THE LEFT HEMISPHERE.

HOW DO WE READ?

THE BOY RAN TO HIS MOTHER.

(WONDER, BY R.J. PALACIO)

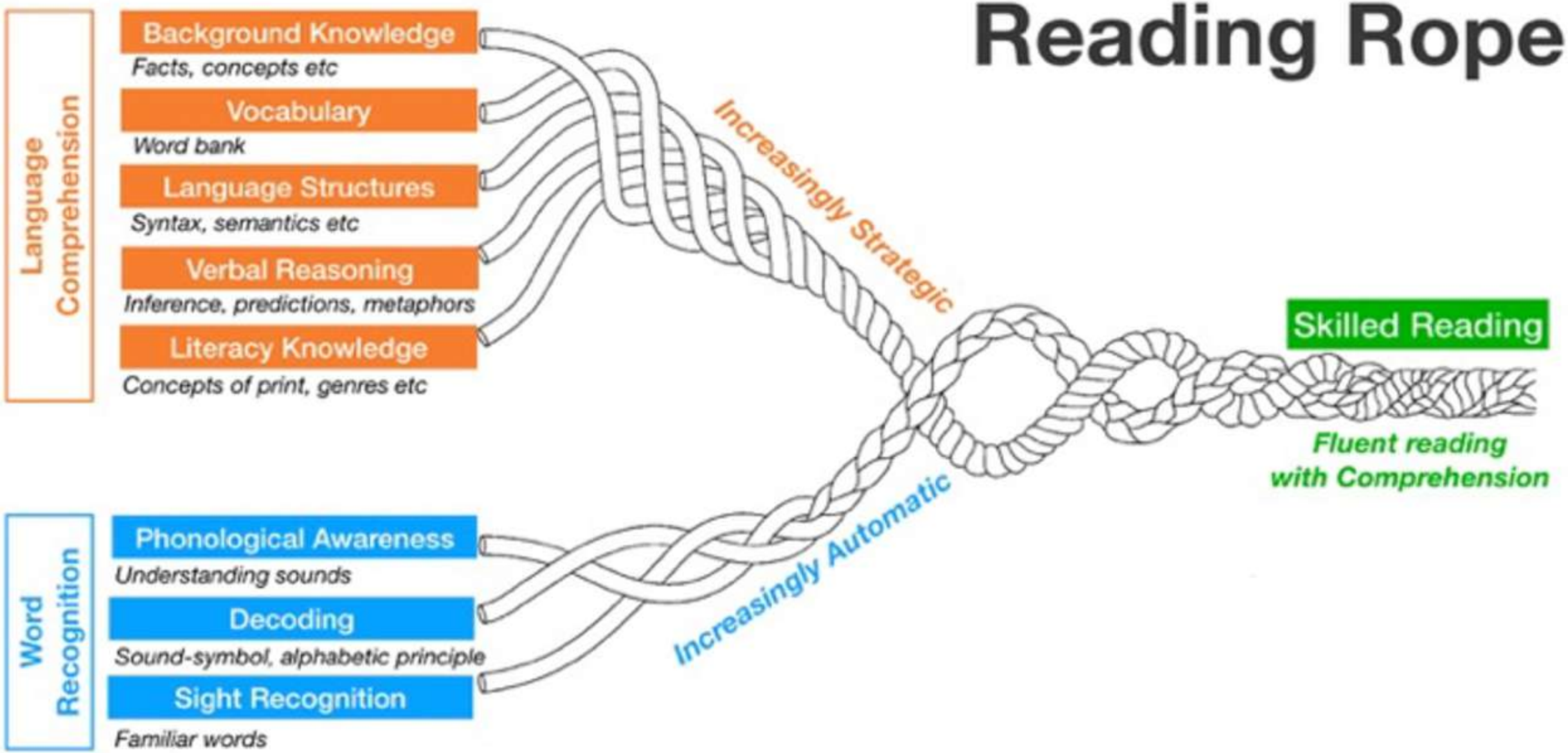


THE READING BRAIN BUILDS ON NEURAL PATHWAYS ESTABLISHED IN SPEECH, AND IT DEVELOPS NEW PATHWAYS AND CONNECTIONS BETWEEN DIFFERENT AREAS OF THE BRAIN. "THE EMERGENCE OF THIS NETWORK STARTS AS EARLY AS IN UTERO. WHEN BABIES ARE EXPOSED TO THE MUFFLED SOUNDS OF SPEECH". (OZERNOV-PALCHIK & GAAB 2016)

D X C = WR

GOUGH & TUNMER 1986 (IN MOATS & TOLMAN 2019:16), OAKHILL ET AL(2015:12)

Reading Rope



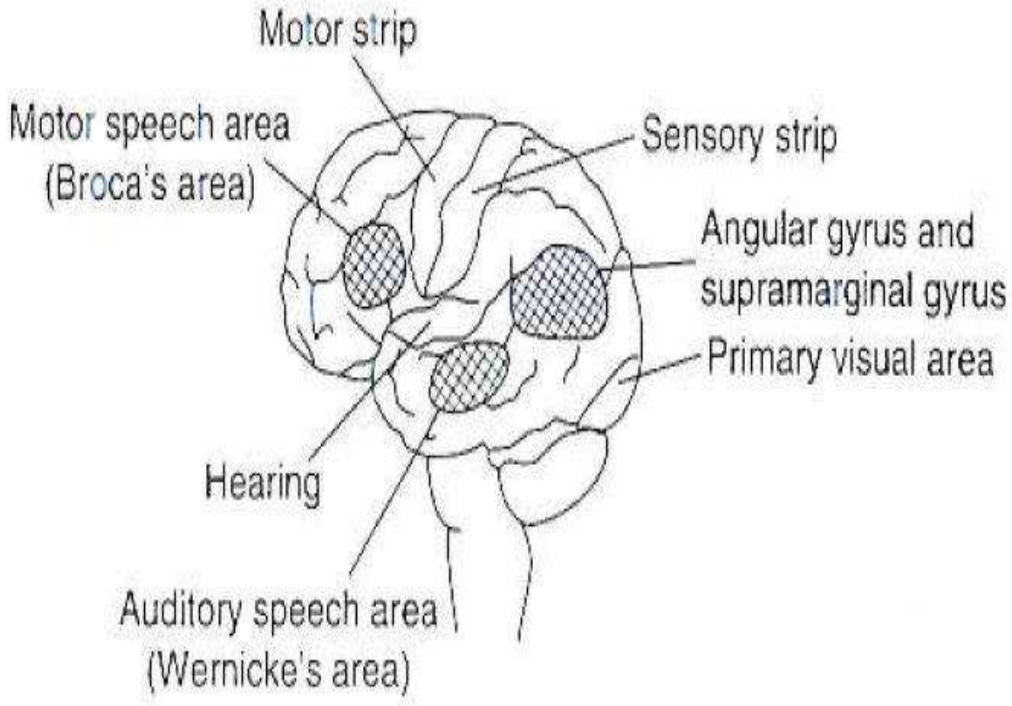
Reading Rope, Scarborough 2001

WHAT AREAS OF READING SHOULD BE ASSESSED?

- PHONOLOGICAL AWARENES
- DECODING SKILLS (WORD ATTACK SKILLS USING REAL AND NON-REAL WORDS)
- FLUENCY
- VOCABULARY
- COMPREHENSION

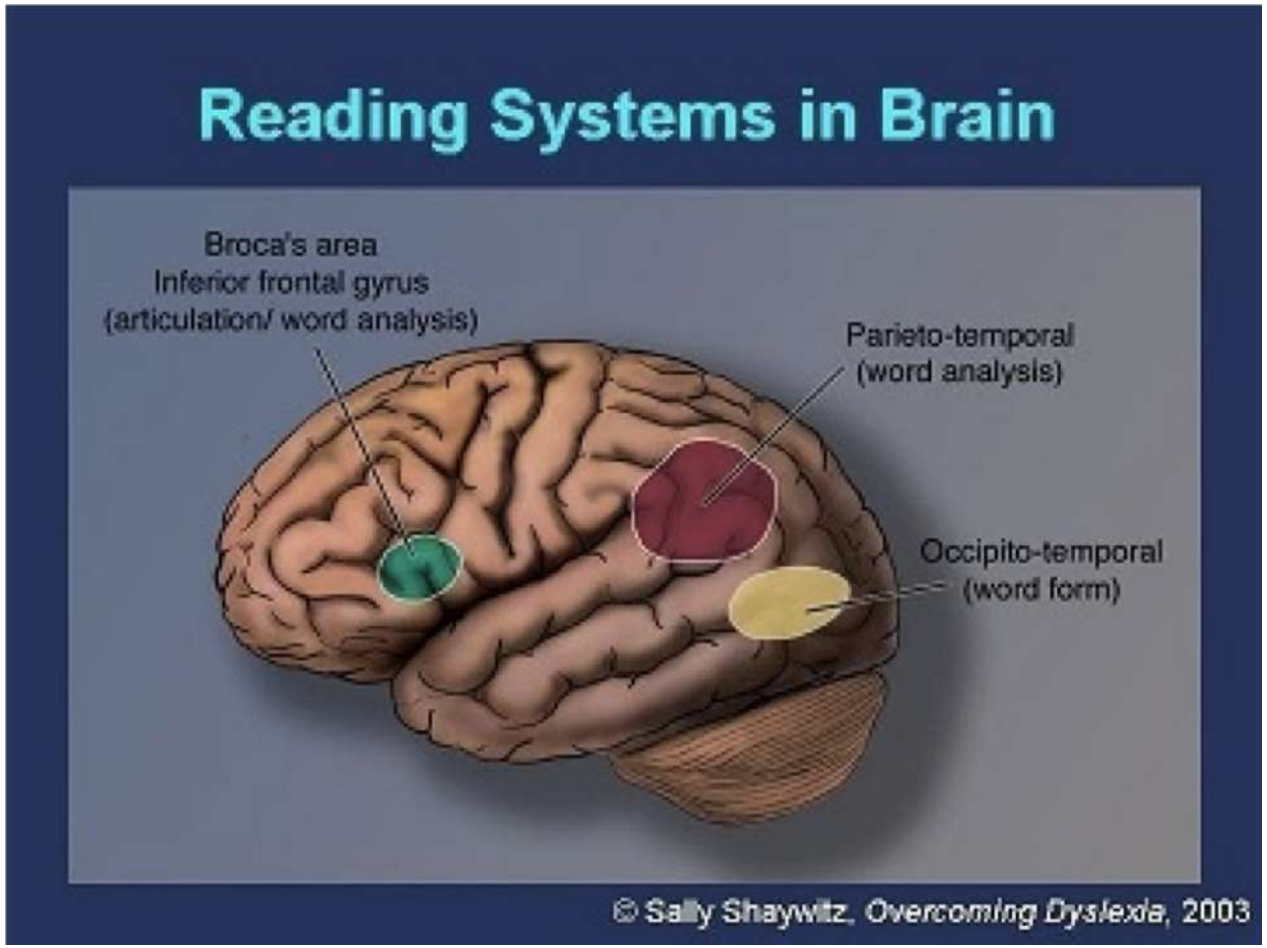
BASIC NEUROLOGY OF READING BRAIN: LEFT HEMISPHERE INVOLVED IN LANGUAGE AREAS.

- WERNICKE AREA (AUDITORY ASSOCIATION) . RECOGNITION AND ANALYSIS OF SPOKEN LANGUAGE.
- BROCA'S AREA – ANTERIOR TO MOTOR AREA. CONTROL MOVEMENT OF FACE AND MOUTH FOR PRODUCING COORDINATED SPEECH.
- MOTOR AREA – FOR WRITING
- SUPRAMARGINAL GYRUS – SOUNDS OF WORDS ARE ASSOCIATED WITH THEIR MEANING
- ANGULAR GYRUS – PATTERNS OF WRITTEN SYMBOLS ARE ASSOCIATED WITH THEIR VERBAL COUNTERPARTS AND THE CONCEPT THEY REPRESENT. ACCESS LETTERS TO PHONOLOGY TO MAKE UP A WORD.

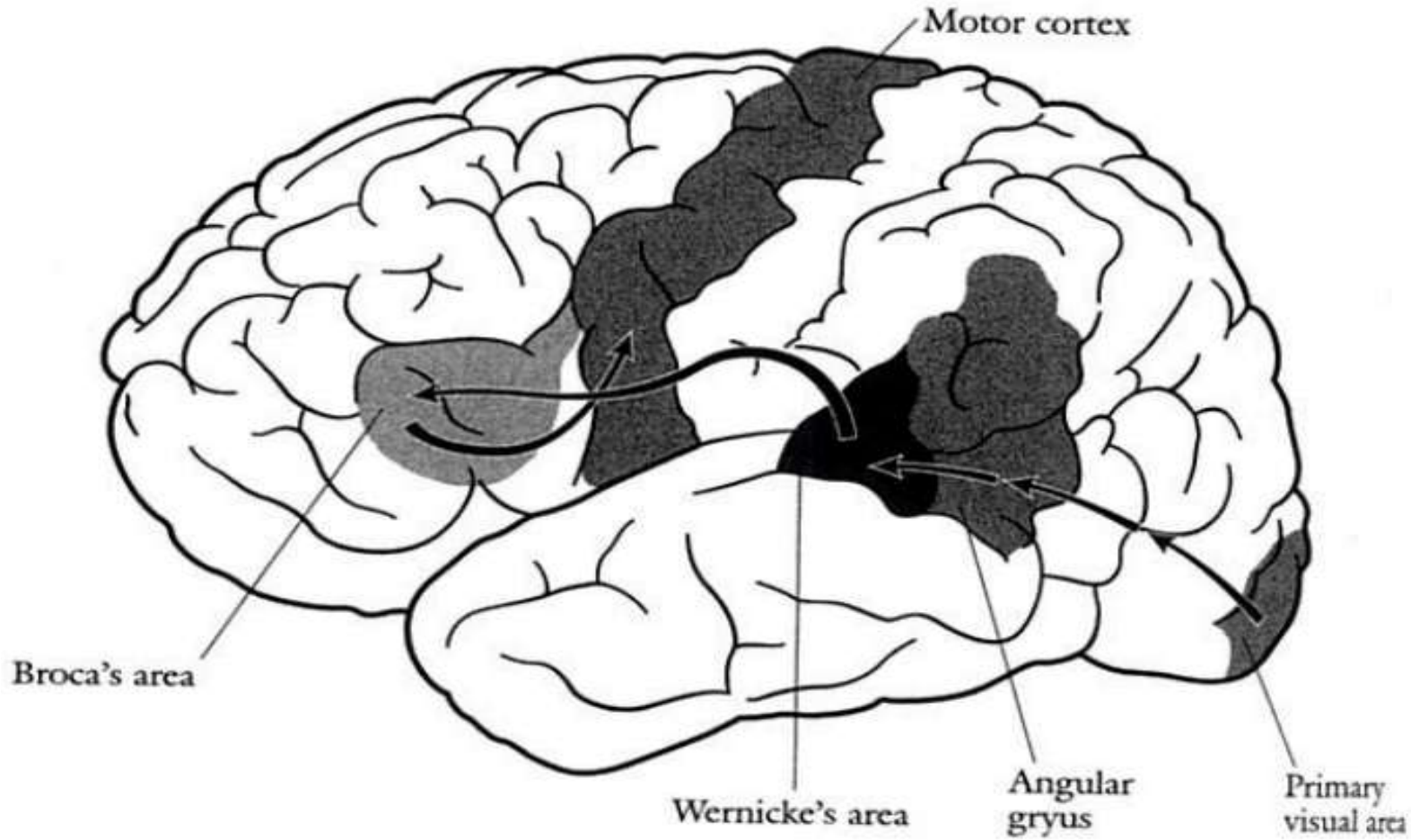


FROM: THOMSON, M FIG 5.5, PG. 97

NEURAL SYSTEMS FOR READING IN TYPICALLY DEVELOPING CHILD SHAYWITZ (2003:4)



THE READING NETWORK

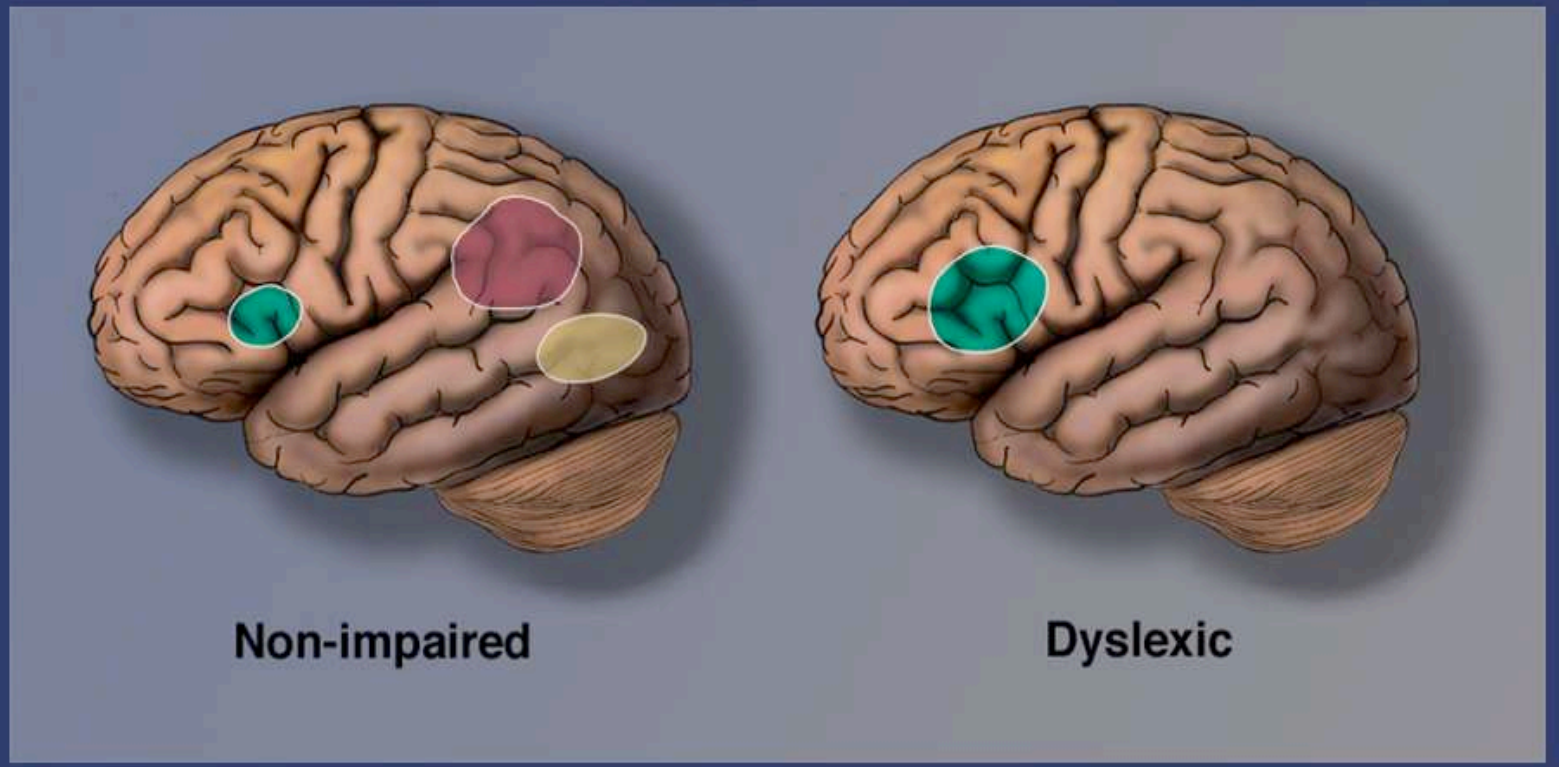


SNOWLING 2000:150 (FIG A)

THE NEURODIVERSITY OF THE READING BRAIN

Neural Signature for Dyslexia:

Inefficient Posterior Reading Systems



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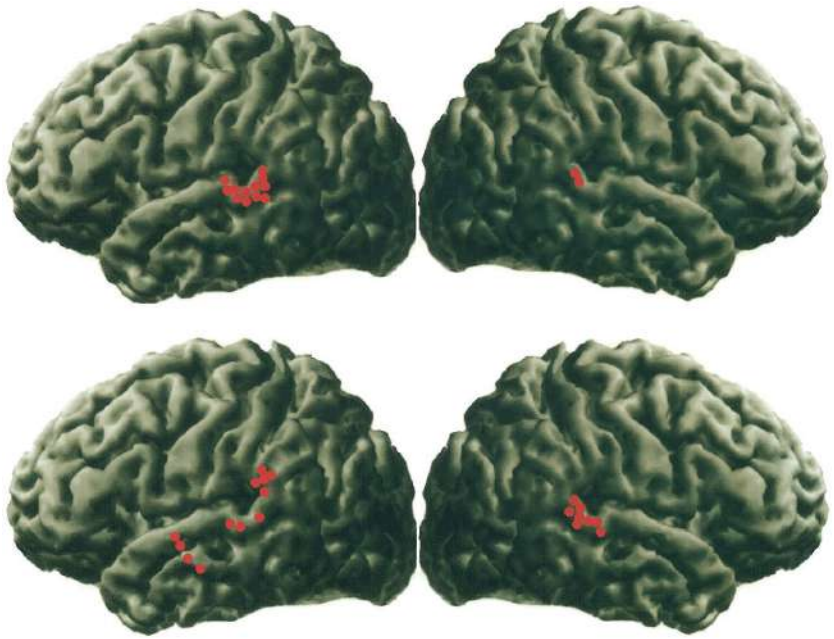
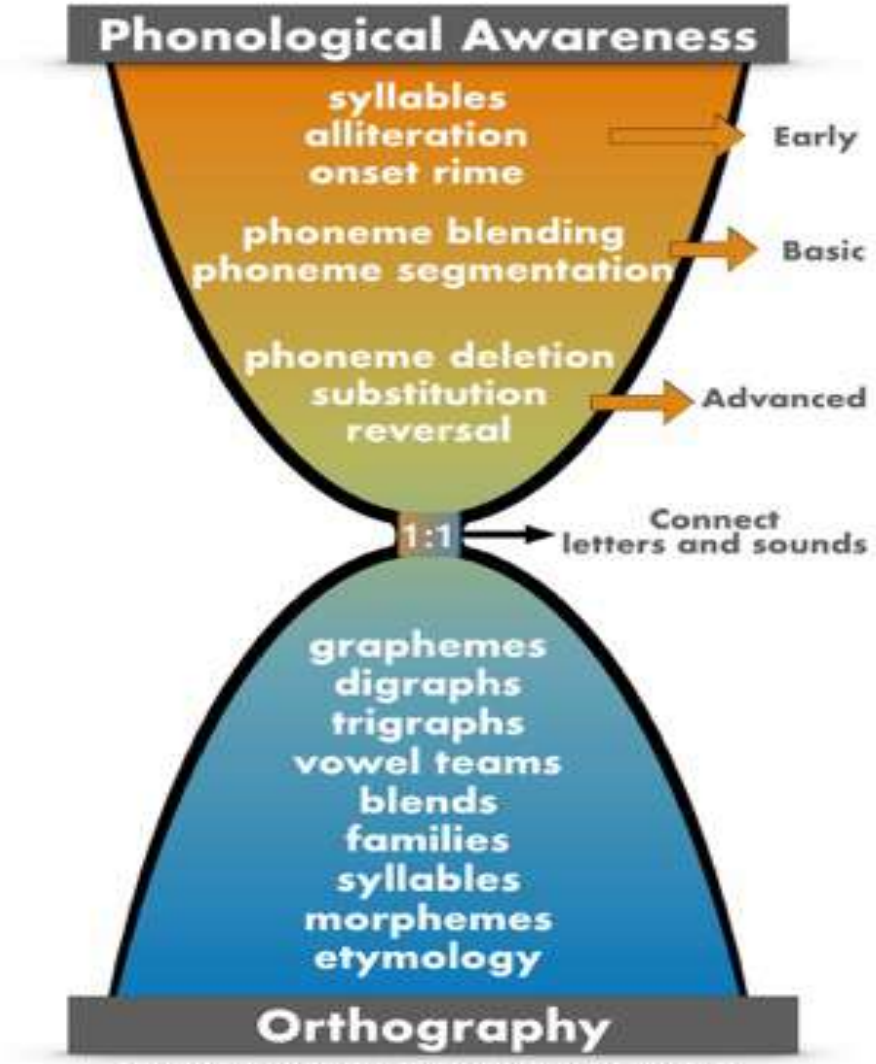
TEMPOROPARIETAL ATYPICAL ACTIVATION IN PHONIC ANALYSIS

- INDIVIDUAL MAGNETOENCEPHALOGRAPHY SCANS FROM A CHILD IN THE GROUP WITH NO IMPAIRMENT (TOP) AND A CHILD IN THE GROUP WITH DYSLEXIA (BOTTOM) IN PHONETIC ANALYSIS. LATE ACTIVITY SOURCES (I.E., THOSE OCCURRING AFTER 200 MS POST–STIMULUS ONSET) ARE REPRESENTED BY ORANGE CIRCLES.
- NO IMPAIRMENT (TOP) :WELL-FORMED MAP OF ACTIVITY IN THE LEFT TEMPOROPARIETAL REGION WITH RELATIVELY REDUCED ACTIVITY RIGHT HEMISPHERE TEMPEROPARIETAL REGION.
- BOTTOM, LEARNER WITH DYSLEXIA: WELL-FORMED MAP IN THE RIGHT TEMPOROPARIETAL REGION WITH EQUIVALENT BUT MORE DIFFUSE ACTIVITY IN THE LEFT HEMISPHERE.



BRIER J.I, PANAGIOTIS, G., SIMOS, J.M. ET AL (2003:615)

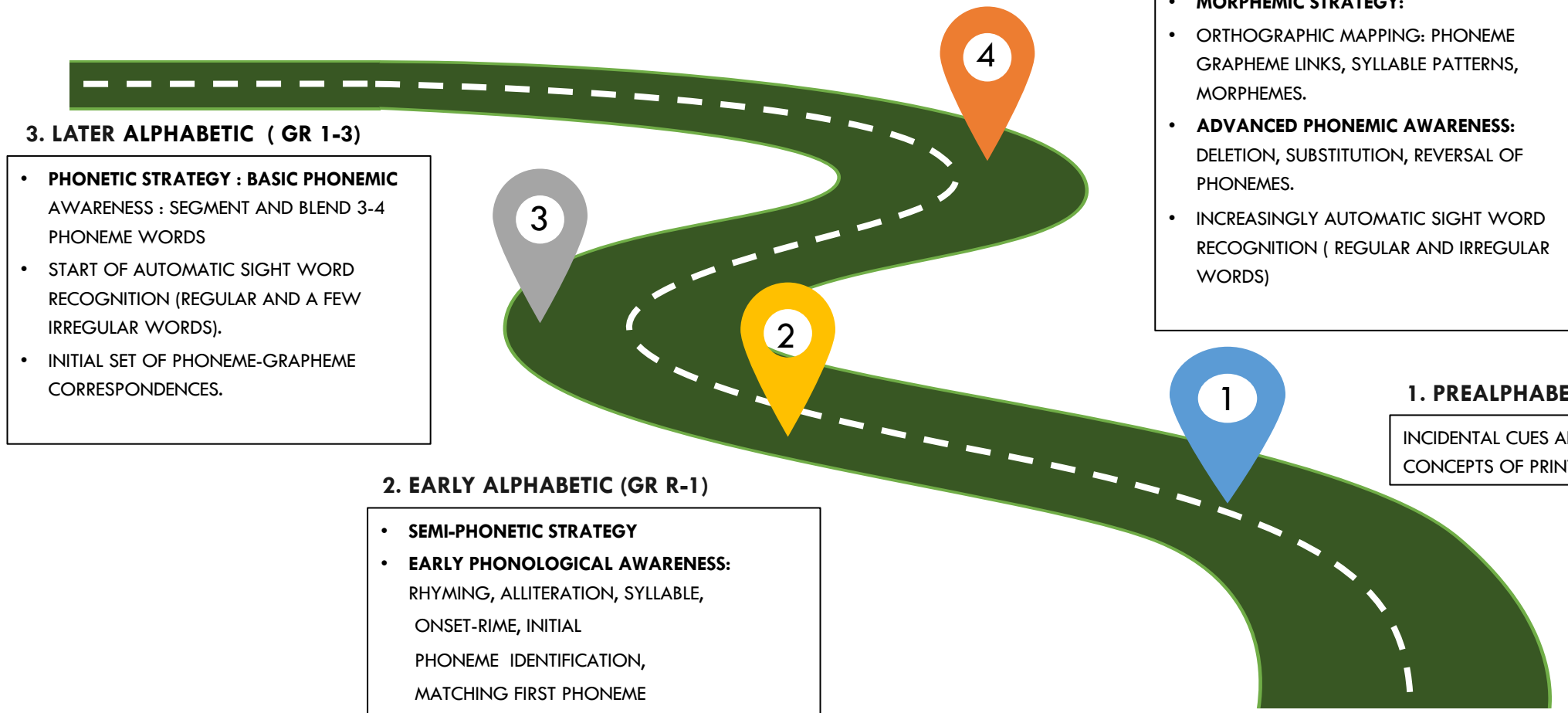
FROM SPEECH TO PRINT



The Hourglass Figure. (Courtesy of Carol A. Tolman)

FOUNDATIONS OF READING IS THE ABILITY TO SEGMENT SPOKEN WORDS: EHRI'S PHASES IN WORD READING DEVELOPMENT

ADAPTED MOATS & TOLMAN 2019:43



4. CONSOLIDATED ALPHABETIC (GR 3 & BEYOND)

- **MORPHEMIC STRATEGY:**
- ORTHOGRAPHIC MAPPING: PHONEME GRAPHEME LINKS, SYLLABLE PATTERNS, MORPHEMES.
- **ADVANCED PHONEMIC AWARENESS:** DELETION, SUBSTITUTION, REVERSAL OF PHONEMES.
- INCREASINGLY AUTOMATIC SIGHT WORD RECOGNITION (REGULAR AND IRREGULAR WORDS)

3. LATER ALPHABETIC (GR 1-3)

- **PHONETIC STRATEGY : BASIC PHONEMIC** AWARENESS : SEGMENT AND BLEND 3-4 PHONEME WORDS
- START OF AUTOMATIC SIGHT WORD RECOGNITION (REGULAR AND A FEW IRREGULAR WORDS).
- INITIAL SET OF PHONEME-GRAPHEME CORRESPONDENCES.

2. EARLY ALPHABETIC (GR R-1)

- **SEMI-PHONETIC STRATEGY**
- **EARLY PHONOLOGICAL AWARENESS:** RHYMING, ALLITERATION, SYLLABLE, ONSET-RIME, INITIAL PHONEME IDENTIFICATION, MATCHING FIRST PHONEME
- LETTER NAMES AND SOME LETTER SOUNDS.

1. PREALPHABETIC (2-5YRS)

INCIDENTAL CUES AND GENERAL CONCEPTS OF PRINT.

Three Phases of Word Reading Development depend on their Phonological Counterparts

Phonological Development	Reading Development
1. Early Phonological Awareness Rhyming, Alliteration, Syllable Segmentation, First Sound Awareness	1. Letter Name & Letter Sound Knowledge
2. Basic Phonemic Awareness Segmentation & Blending	2. Phonic Decoding & Basic Spelling Skills
3. Advanced Phonemic Awareness Best assessed via phonemic manipulation (and timed)	3. Orthographic Mapping (i.e., efficient sight word acquisition – a rudimentary version of #3 overlaps with #2)

KILPATRICK, 2015

IDENTIFY RISK EARLY:

- EARLY ORAL LANGUAGE SKILLS
- PRINT AWARENESS
- PHONEMIC AWARENESS
- PRIMITIVE EARLY SPELLING
- LETTER KNOWLEDGE

HOW DOES WRITING DEVELOP?

SIMPLE VIEW OF WRITING

FOUNDATIONAL WRITING SKILLS × COMPOSITION = SKILLED WRITTEN EXPRESSION

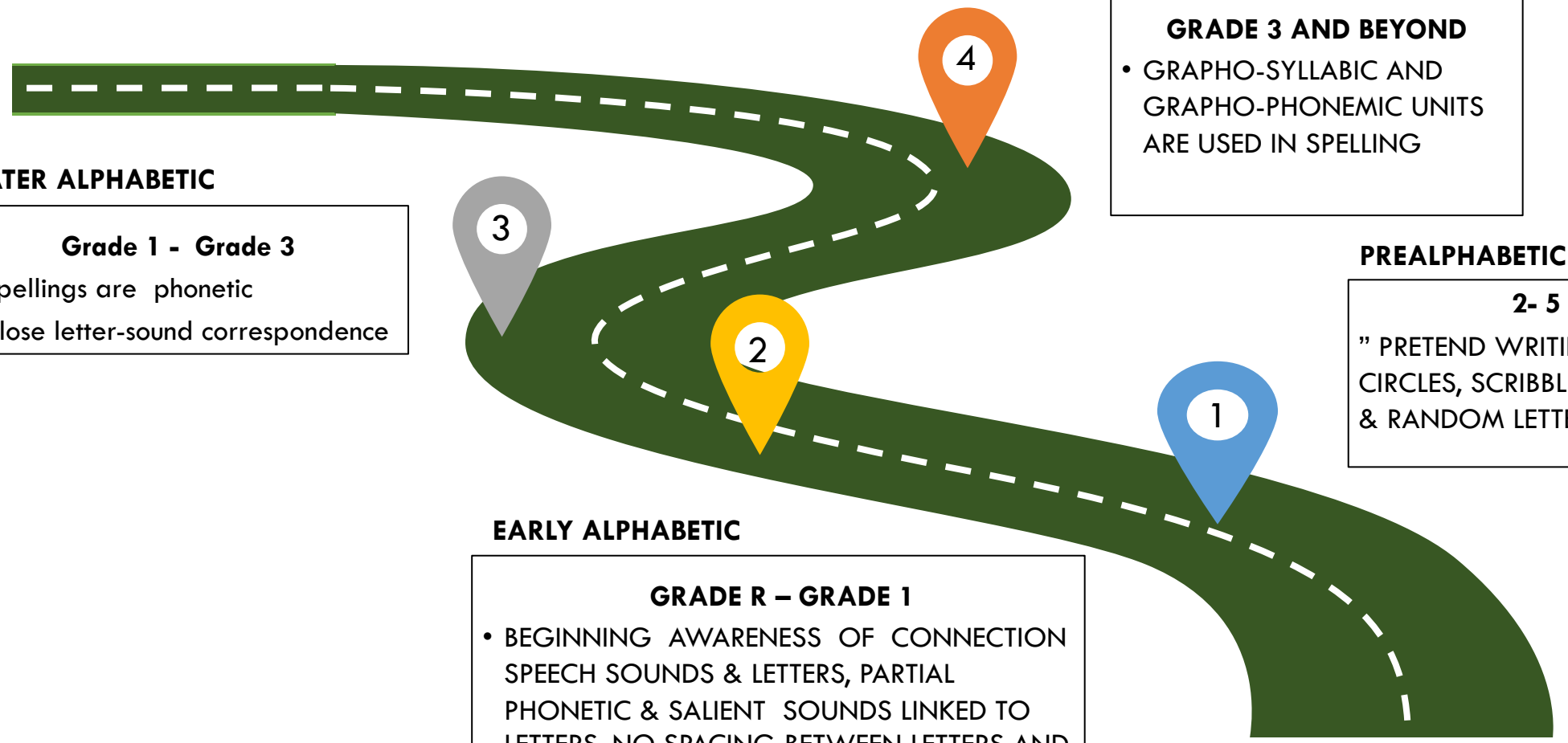
- LETTER FORMATION
- HAND-WRITING/TYPING FLUENCY
- SPELLING
- PUNCTUATION
- WORD/SENTENCE SPATIAL ORGANIZATION

- TOPIC KNOWLEDGE
- VOCABULARY
- SENTENCE FORMULATION
- GRAMMAR
- GENRES
- ORGANIZATION OF IDEAS
- AUDIENCE AWARENESS
- EXECUTIVE FUNCTIONING

THE SAME AREAS OF THE BRAIN USED IN READING ARE USED IN WRITING (BERNINGER & WOLF, 2016)

LETRS 2019: 233

EHRI'S PHASES IN WRITING DEVELOPMENT



CONSOLIDATED ALPHABETIC

GRADE 3 AND BEYOND

- GRAPHO-SYLLABIC AND GRAPHO-PHONEMIC UNITS ARE USED IN SPELLING

LATER ALPHABETIC

Grade 1 - Grade 3

- Spellings are phonetic
- Close letter-sound correspondence

PREALPHABETIC

2- 5 YEARS

" PRETEND WRITING" –LINES, CIRCLES, SCRIBBLES, MOCK LETTERS & RANDOM LETTER STRINGS.

EARLY ALPHABETIC

GRADE R – GRADE 1

- BEGINNING AWARENESS OF CONNECTION SPEECH SOUNDS & LETTERS, PARTIAL PHONETIC & SALIENT SOUNDS LINKED TO LETTERS, NO SPACING BETWEEN LETTERS AND DIFFERENT WORDS

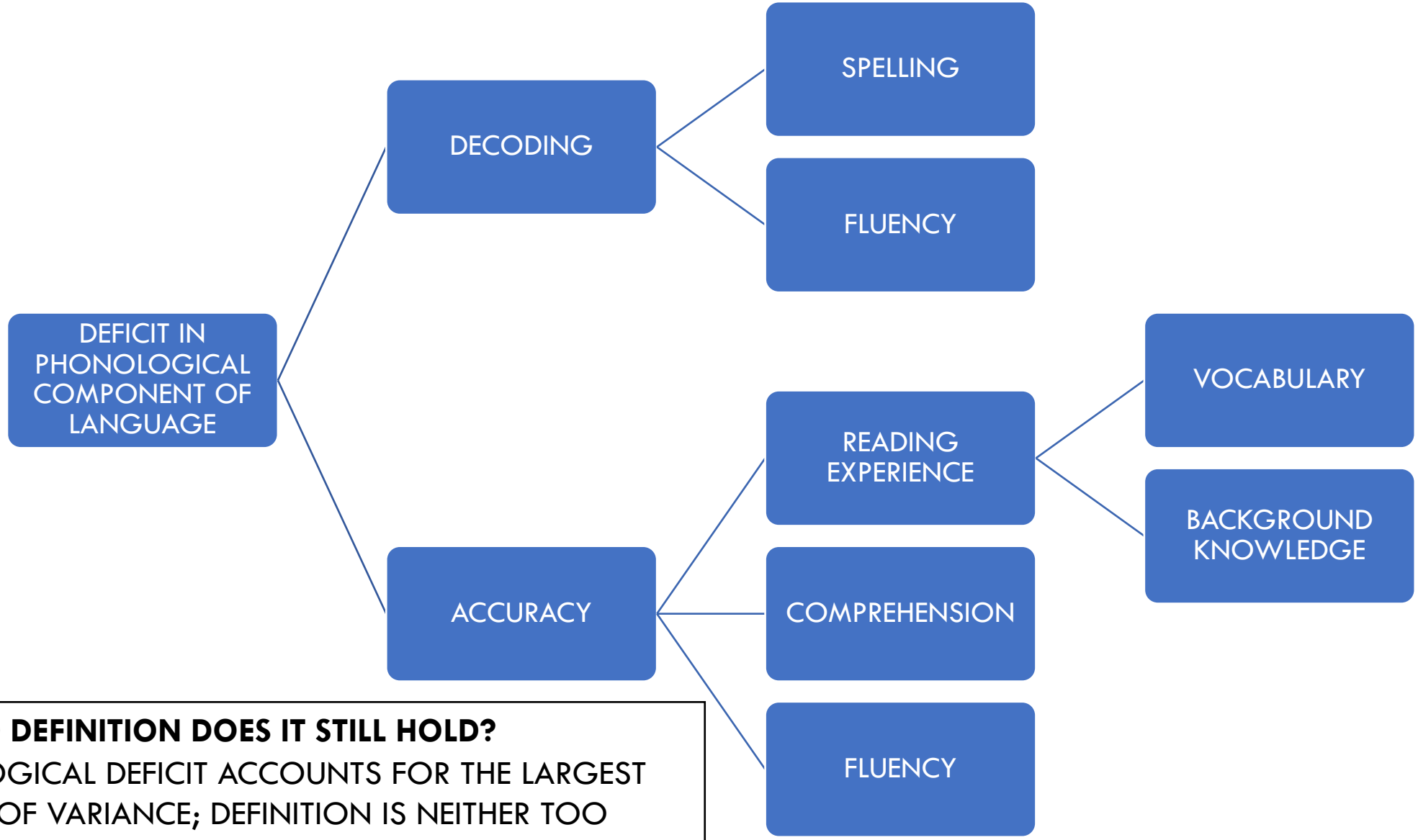
DEFINITIONS OF DYSLEXIA & IMPLICATIONS FOR PROFILING/ ASSESSMENT

INTERNATIONAL DYSLEXIA ASSOCIATION (IDA) & NATIONAL INSTITUTE OF CHILD HEALTH AND HUMAN DEVELOPMENT (NICHD)

"DYSLEXIA IS A SPECIFIC LEARNING DISABILITY THAT IS NEUROLOGICAL IN ORIGIN. IT IS CHARACTERIZED BY DIFFICULTIES WITH ACCURATE AND/OR FLUENT WORD RECOGNITION AND BY POOR SPELLING AND DECODING ABILITIES. THESE DIFFICULTIES TYPICALLY RESULT FROM A DEFICIT IN THE PHONOLOGICAL COMPONENT OF LANGUAGE THAT IS OFTEN UNEXPECTED IN RELATION TO OTHER COGNITIVE ABILITIES AND THE PROVISION OF EFFECTIVE CLASSROOM INSTRUCTION.

SECONDARY CONSEQUENCES MAY INCLUDE PROBLEMS IN READING COMPREHENSION AND REDUCED READING EXPERIENCE THAT CAN IMPEDE GROWTH OF VOCABULARY AND BACKGROUND KNOWLEDGE."

https://dyslexiaida.org/definition-of-dyslexia/



IDA /NICD DEFINITION DOES IT STILL HOLD?

PHONOLOGICAL DEFICIT ACCOUNTS FOR THE LARGEST AMOUNT OF VARIANCE; DEFINITION IS NEITHER TOO BROAD NOR TOO NARROW.

EMERSON DICKMAN, MARCH 2017

DSM V : DEFINITION OF SPECIFIC LEARNING DIFFICULTY (SPLD)

"SPLD IS DIAGNOSED WHEN THERE ARE SPECIFIC DEFICITS IN AN INDIVIDUAL'S ABILITY TO **PERCEIVE OR PROCESS INFORMATION EFFICIENTLY AND ACCURATELY.** THIS **NEURODEVELOPMENTAL DISORDER** FIRST MANIFESTS DURING THE **FORMAL YEARS OF SCHOOLING** AND IS CHARACTERIZED BY PERSISTENT AND IMPAIRING DIFFICULTIES IN LEARNING FOUNDATIONAL ACADEMIC SKILLS IN READING, WRITING, AND OR MATH. THE INDIVIDUAL'S PERFORMANCE ON THE AFFECTED ACADEMIC SKILLS IS **WELL BELOW AVERAGE FOR AGE, OR ACCEPTABLE PERFORMANCE LEVELS ARE ACHIEVED ONLY WITH EXTRAORDINARY EFFORT**… MAY OCCUR IN INDIVIDUALS IDENTIFIED AS INTELLECTUALLY GIFTED AND MANIFEST ONLY WHEN THE LEARNING DEMANDS OR ASSESSMENT PROCEDURES (E.G. TIMED TESTS) POSE BARRIERS THAT CANNOT BE OVERCOME BY THEIR INNATE INTELLIGENCE AND COMPENSATORY STRATEGIES."

(2017:32)

DSM V: SPLD (CONT) DSM V (2013: 66-67)

FOUR DIAGNOSTIC CRITERIA MUST BE MET FOR SPLD

- A) **DIFFICULTIES LEARNING AND USING ACADEMIC SKILLS -** *PERSIST FOR AT LEAST 6 MONTHS*, DESPITE PROVISION OF INTERVENTIONS THAT TARGET THOSE DIFFICULTIES:
    - INACCURATE OR SLOW AND EFFORTFUL WORD READING
    - DIFFICULTY UNDERSTANDING MEANING OF WHAT IS READ
    - DIFFICULTIES WITH SPELLING
    - DIFFICULTIES MASTERING NUMBER SENSE, NUMBER FACTS OR CALCULATION
    - DIFFICULTIES WITH MATHEMATICAL REASONING
- B) **SUBSTANTIALLY AND QUANTIFIABLY BELOW** THOSE EXPECTED FOR THE INDIVIDUAL'S CHRONOLOGICAL AGE.
- C) **BEGIN DURING SCHOOL YEARS**
- D) **NOT BETTER ACCOUNTED** FOR BY INTELLECTUAL DISABILITIES, UNCORRECTED VISUAL OR AUDITORY ACUITY, OTHER MENTAL OR NEUROLOGICAL DISORDERS, PSYCHOSOCIAL ADVERSITY, LACK OF PROFICIENCY IN THE LANGUAGE OF INSTRUCTION OR INADEQUATE EDUCATIONAL INSTRUCTIONS.

DSM V: DYSLEXIA

WHEN **DYSLEXIA IS AS AN ALTERNATIVE TERM** USED TO REFER TO A PATTERN OF LEARNING DIFFICULTIES CHARACTERIZED BY PROBLEMS WITH ACCURATE OR FLUENT WORD RECOGNITION, POOR DECODING, AND POOR SPELLING ABILITIES. IF DYSLEXIA IS USED TO SPECIFY THIS PARTICULAR PATTERN OF DIFFICULTIES, AND ANY ADDITIONAL DIFFICULTIES THAT ARE PRESENT, E.G. READING COMPREHENSION OR MATH REASONING YOU MUST SPECIFY THE NATURE OF THE DIFFICULTY.

- **MILD** - ABLE TO COMPENSATE OR FUNCTION WELL WITH APPROPRIATE ACCOMMODATIONS
- **MODERATE**- UNLIKELY TO BECOME PROFICIENT WITHOUT SOME INTERVALS OF INTENSIVE AND SPECIALIZED TEACHING IN SCHOOL YEARS.
- **SEVERE** - REQUIRE INTENSIVE INDIVIDUALIZED AND ONGOING SUPPORT MOST OF SCHOOL YEARS.

(DSM V: 67)

DSM V: SPECIFICATIONS

- **(F81.0) WITH IMPAIRMENT IN READING**
  - ACCURACY
  - RATE OR FLUENCY
  - COMPREHENSION
- **(F81.81) WITH IMPAIRMENT IN WRITTEN EXPRESSION:**
  - SPELLING ACCURACY
  - GRAMMAR AND PUNCTUATION
  - CLARITY OR ORGANIZATION OF WRITTEN EXPRESSION
- **(F 81.2) WITH IMPAIRMENT IN MATHEMATICS:**
  - NUMBER SENSE
  - MEMORIZATION OF ARITHMETIC FACTS
  - ACCURATE OR FLUENT CALCULATION
  - ACCURATE MATH REASONING

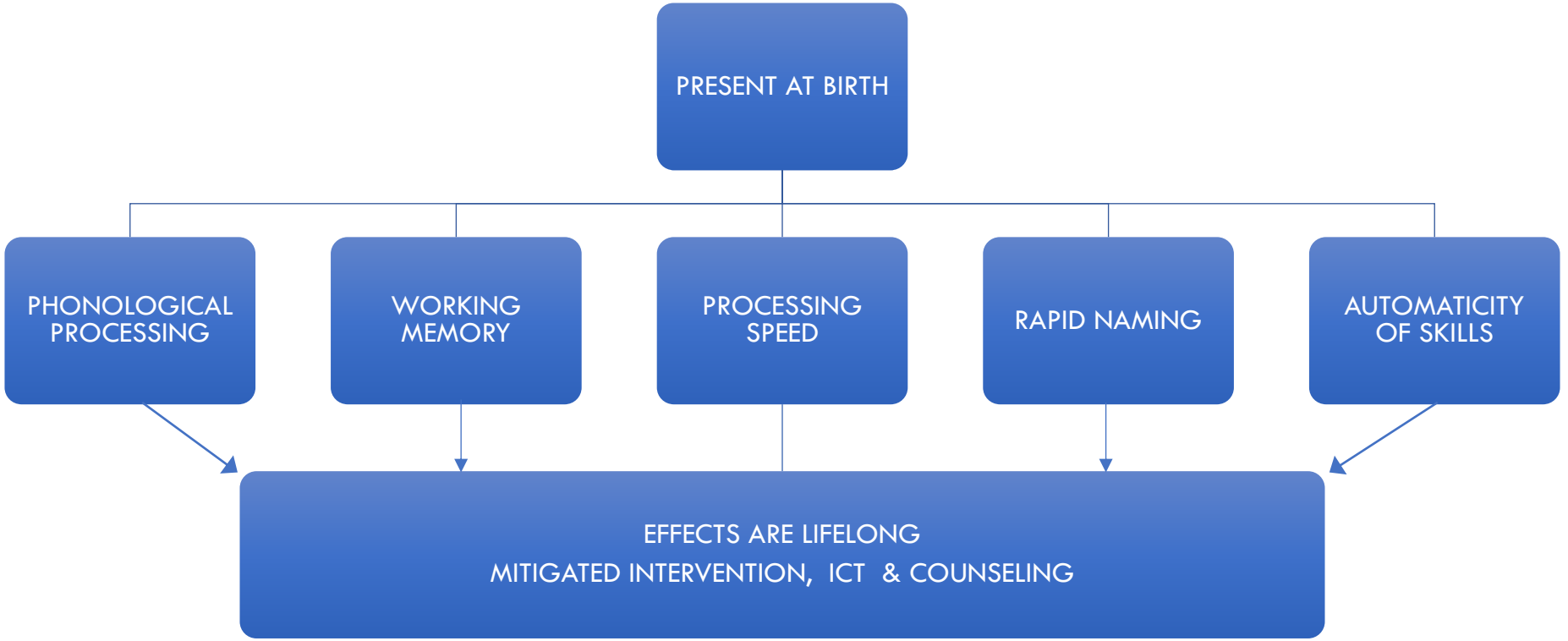
SIMILARLY FOR DYSCALCULIA TO SPECIFY THE DIFFICULTIES.

BRITISH DYSLEXIA ASSOCIATION

- "DYSLEXIA IS A SPECIFIC LEARNING DIFFICULTY THAT MAINLY AFFECTS THE DEVELOPMENT OF LITERACY AND LANGUAGE RELATED SKILLS. IT IS LIKELY TO BE PRESENT AT BIRTH AND TO BE LIFE-LONG IN ITS EFFECTS. IT IS CHARACTERISED BY DIFFICULTIES WITH PHONOLOGICAL PROCESSING, RAPID NAMING, WORKING MEMORY, PROCESSING SPEED, AND THE AUTOMATIC DEVELOPMENT OF SKILLS THAT MAY NOT MATCH UP TO AN INDIVIDUAL'S OTHER COGNITIVE ABILITIES. IT TENDS TO BE RESISTANT TO CONVENTIONAL TEACHING METHODS, BUT ITS EFFECT CAN BE MITIGATED BY APPROPRIATE SPECIFIC INTERVENTION, INCLUDING THE APPLICATION OF INFORMATION TECHNOLOGY AND SUPPORTIVE COUNSELLING."
- BDA RECOGNIZES THAT SOME INDIVIDUALS MIGHT HAVE **VISUAL AND AUDITORY PROCESSING DIFFICULTIES BUT IT IS NOT CAUSAL.** DYSLEXIC INDIVIDUALS MIGHT SHOW COMBINATIONS OF ABILITIES AND DIFFICULTIES AND SOME HAVE STRENGTHS IN DESIGN, PROBLEM SOLVING, CREATIVITY, INTERACTIVE AND ORAL SKILLS.

HTTP://WWW.BDADYSLEXIA.ORG.UK/DYSLEXIC/DEFINITION

BDA DEFINITION



COMMONALITIES & DIFFERENCES IN 3 DEFINITIONS

CRITERION	DSM V	BDA	IDA
NEURODEVELOPMENTAL	✓	✓	✓
AFFECTS READING & SPELLING	✓	✓	✓
SPECIFIES UNDERLYING COGNITIVE PROCESSES	✗	✓	✓
EXISTS ON A CONTINUUM	✓	?	?
LIFELONG	✓	✓	✓
NOT RELATED TO INTELLIGENCE; NOT SENSORY DEFICIT	✓	✓	✓
CAN BE IDENTIFIED BEFORE FORMAL SCHOOLING	✗	✓	✓

INDICATORS OF RISK FOR DYSLEXIA

PRESCHOOL YEARS

- FAMILIAL HISTORY OF LEARNING DIFFICULTIES
- SPEECH-LANGUAGE DELAY
- POOR SENSITIVITY TO RHYME
- LACK OF FAMILIARITY WITH NURSERY RHYMES
- ARTICULATION DIFFICULTIES
- PROPRIOCEPTIVE FEEDBACK DIFFICULITIES

GRADE R –GRADE 1

- DIFFICULTY GENERATING OR IDENTIFYING RHYMING WORDS
- DIFFICULTY SEGMENTING WORDS BY SYLLABLE
- UNABLE TO RECITE ALPHABET
- STRUGGLES TO CONSOLIDATE LETTER-SOUND KNOWLEDGE
- RELIANT ON SURROUNDING CONTEXT TO GAIN MEANING FROM TEXT
- COMPLAINS READING IS DIFFICULT
- HIDES WHEN IT IS TIME READ/WRITE
- OMITS LETTERS OR SOUNDS IN SPELLING AND READING
- DIFFICULTY FOLLOW INSTRUCTIONS

GRADE 2 TO 3

- CONFUSES WORDS THAT SOUND SIMILAR E.G. TORNADO – VOLCANO
- WORD FINDING DIFFICULTY (STUFF/THING/THAT ETC.)
- TRANSPOSITION OF LETTERS IN SPELLING BEYOND 8 YEARS
- POOR RECALL OF COMMON SEQUENCES
- FEAR OF READING ALOUD IN CLASS
- STUMBLES ON MULTI-SYLLABIC WORD & PHONETICALLY IRREGULAR WORDS
- SLOW EFFORTFUL READING
- POOR COPYING SKILLS

GRADES 4-7

- MANY PREVIOUS DIFFICULTIES PERSIST
- DIFFICULTY FOLLOWING LONG OR COMPLEX INSTRUCTIONS
- SLOW RECALL OF FACTS
- DISLIKE OF READING
- FATIGUES QUICKLY WHEN READING
- EXTREME SPELLING DIFFICULTIES

SECONDARY SCHOOL YEARS

- SLOW READING SPEED
- FATIGUES QUICKLY WHEN READING
- UNUSUALLY LONG HOURS DOING HOMEWORK
- DIFFICULTY STRUCTURING WRITTEN WORK
- PHONETIC APPROXIMATIONS IN SPELLING/EXTREME SPELLING DIFFICULTIES
- SLOW/POOR HANDWRITING
- DECODING DIFFICULTY WITH UNFAMILIAR/POLYSYLLABIC WORDS
- POOR AUTOMATIC RECALL OF FACTS
- POOR SKIMMING AND SCANNING SKILLS

ADULTHOOD

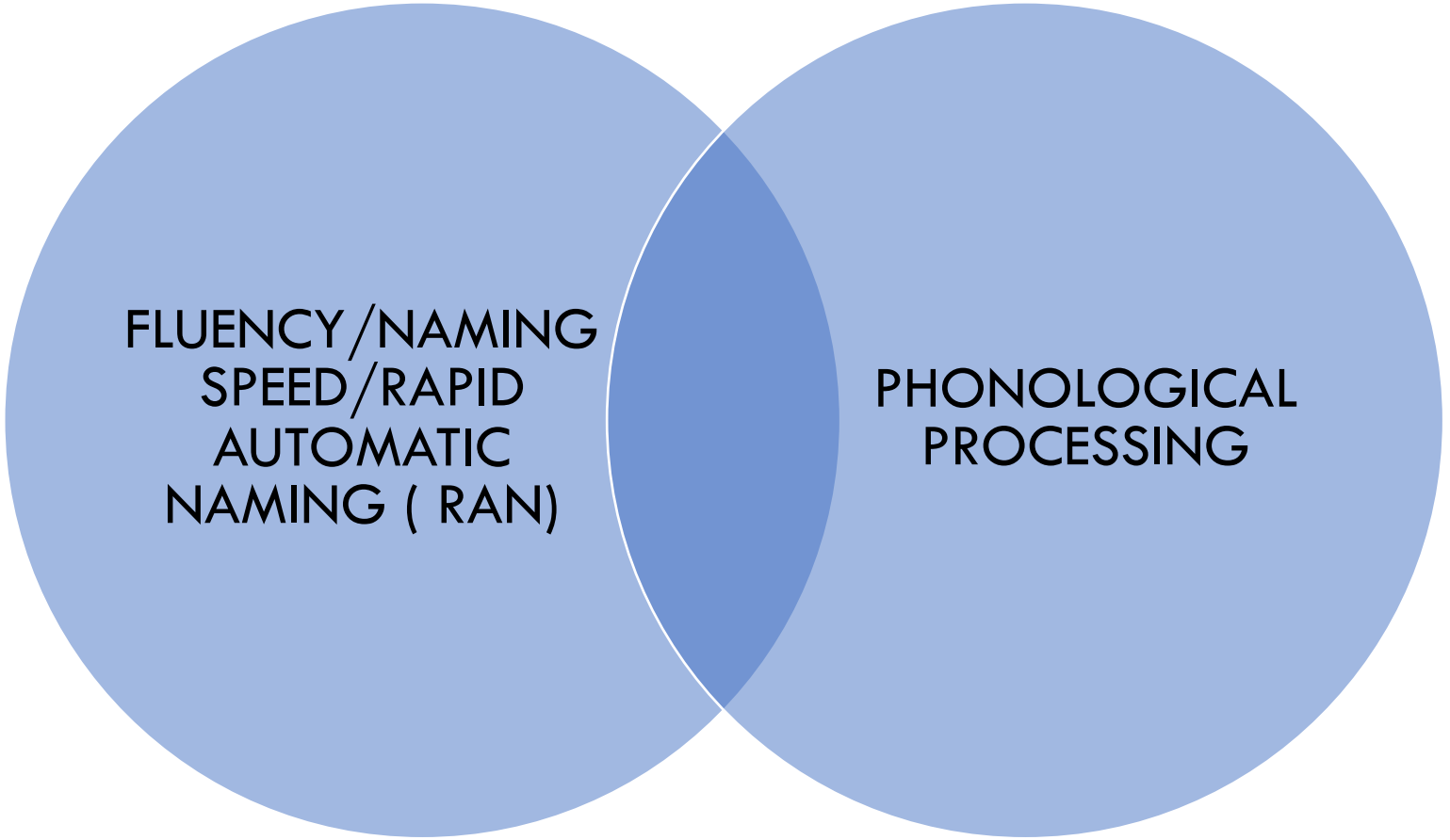
- MANY SECONDARY SCHOOL YEAR SIGNS PERSIST
- DIFFICULTY MULTI-TASKING E.G. LISTENING AND WRITING
- POOR ORGANIZATION OF STUDY SKILLS

ADAPTED FROM SHAYWITZ, 2003 & KELLY & PHILLIPS 2016

PULLING IT ALL TOGETHER!

ADAPTED FROM WAGNER 2018:4

DYSLEXIA SPECTRUM OR DOUBLE DEFICIT?



WHAT DO WE KNOW ?

- INCLUSIVE TO USE A WIDER DEFINITION TO SUPPORT ALL LEARNERS AT RISK OF READING DIFFICULTIES/DYSLEXIA.
- IN REALITY, ONE CANNOT EXCLUDE THE CHILD WHO IS AT RISK BECAUSE OF ENVIRONMENTAL CONDITIONS.
- THE CUT-OFF BETWEEN A READING DIFFICULTY AND NOT HAVING A READING DIFFICULTY IS ARBITRARY
- DYSLEXIA EXISTS ON A CONTINUUM FROM MILD TO SEVERE
- DYSLEXIA EXISTS IN CHILDREN ON THE LOWER END OF INTELLECTUAL ABILITY AND THE SAME INTERVENTION WORKS FOR THEM (STANOVICH 2016)
- RECEPTIVE VOCABULARY, PHONOLOGICAL PROCESSING AND NAMING SPEED ARE PREDICTIVE OF READING ABILITY, IQ IS NOT.
- WE CAN IDENTIFY RISK IN PRESCHOOL AGED CHILDREN PRIOR TO FORMAL SCHOOLING
- DEBUNKED THE VISUAL-PERCEPTUAL DEFICIT IN READING DIFFICULTIES
- DYSLEXIA CAN BE REMEDIATED BUT SOME INDIVIDUALS WILL ALWAYS DEPEND ON COMPENSATORY MECHANISMS

CONCLUSION

THERE IS NO ONE …

- TEST THAT CAN IDENTIFY DYSLEXIA
- GENE THAT CAN EXPLAIN DYSLEXIA
- AREA IN THE BRAIN THAT CAN EXPLAIN DYSLEXIA
- THEORY THAT CAN EXPLAIN DYSLEXIA

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THANK YOU!

“400 /450 MILLISECOND RULE” (WOLF)

- WE FIXATE ON WORD (USUALLY NOUNS AND VERBS); 4-5 LETTERS TO THE RIGHT AND 3-4 LETTERS TO THE LEFT
- SACCADES ARE THE JUMPS BETWEEN WORDS
- GENERALLY BETWEEN 7 TO 8 LETTERS ARE READ CLEARLY ON EACH FIXATION (SEIDENBERG 2017: 70)
- WE EXTRACT MEANING BETWEEN 350 -450 MILLISECONDS, JUST AFTER VISUAL AND PHONOLOGICAL PROCESSING IS ACTIVATED BUT BEFORE SEMANTIC PROCESSING.
- WE READ WITH REGRESSIONS/ FIXATIONS AND SACCADES ARE NEVER EVENLY SPACED
- FIXATIONS DURATIONS AVERAGE 200-250 MILLISECONDS (THAT 4-5 FIXATIONS PER SECOND)
- FIXATIONS DEPEND ON FONT/SPACING AND COMPLEXITY OF TEXT / PURPOSE OF READING
- POOR READERS MAKE MANY MORE REGRESSIONS THAN TYPICALLY DEVELOPING READERS
- WORDS IN MOST TEXT AVERAGE 5 LETTERS LONG

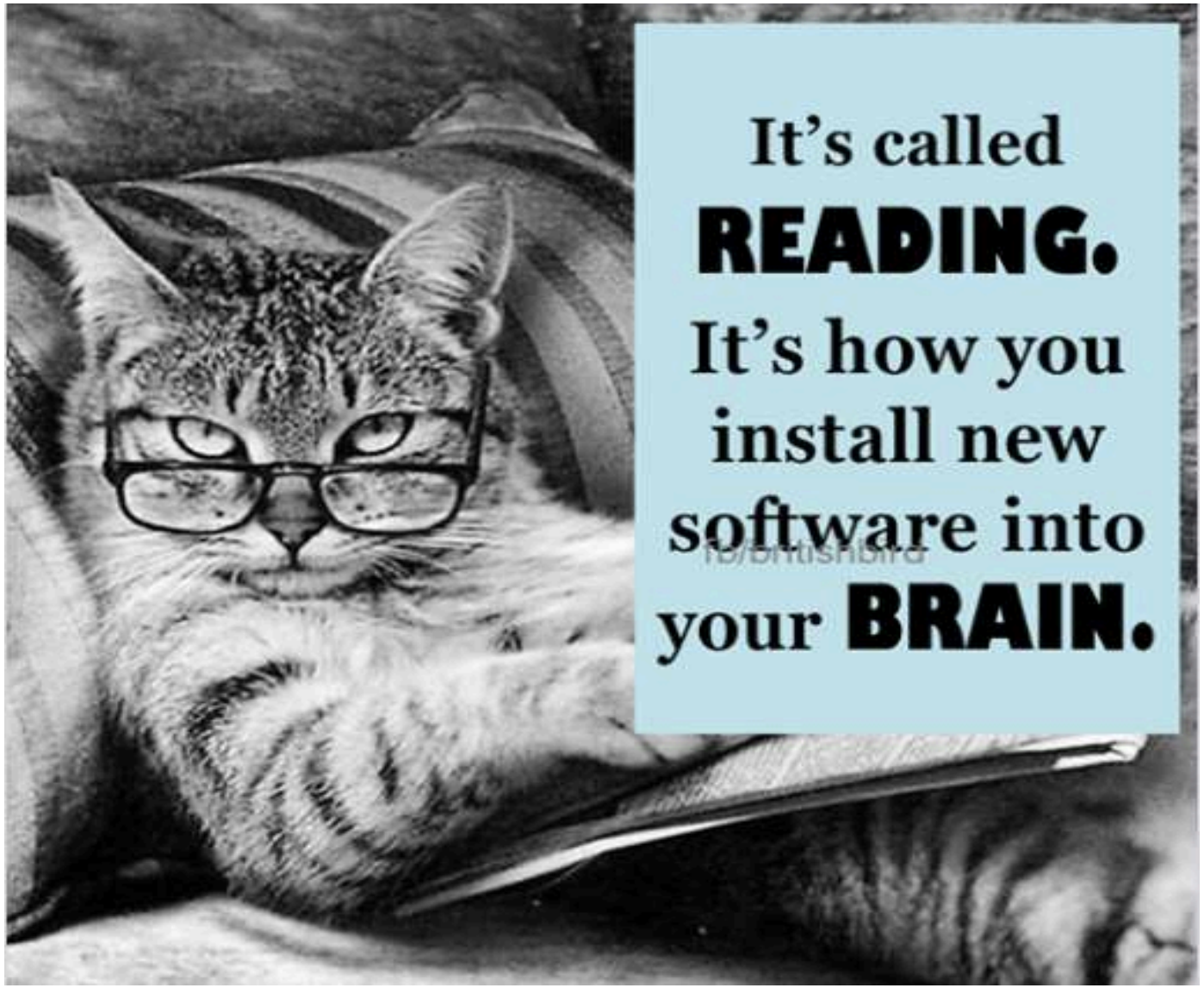
HOW DO WE READ?

MOM ALWAYS HAD THE HABIT OF ASKING ME HOW SOMETHING FELT ON A SCALE OF ONE TO TEN.

(WONDER, BY R.J. PALACIO)

THE WHAT & HOW OF AN INTERVENTION-ORIENTED

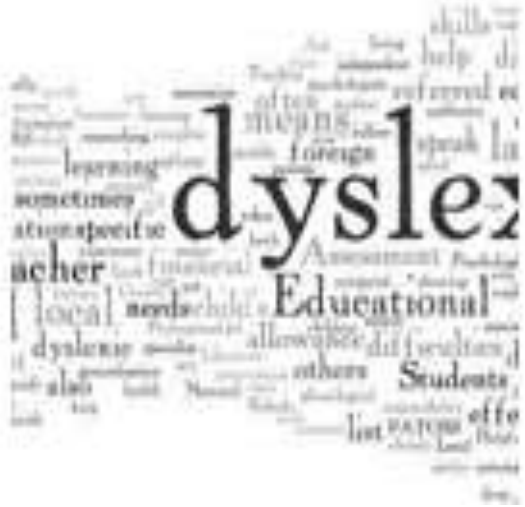
WHAT AND HOW TO PROFILE/DIAGNOSE DYSLEXIA


It's called
READING.
It's how you
install new
software into
your BRAIN.

EARLY IDENTIFICATION
EARLY INTERVENTION
BETTER PROGNOSIS

- Maryanne Wolf (2008)
- Important to identify dyslexia early
- Profile strengths & vulnerabilities of each child
- Target intervention to develop
- Accuracy & then automaticity of each aspect of the reading system.
- Assessing for dyslexia is possible early & accurately before learning to read formally.
- Young children's brains are more plastic & amenable to change compared with that of adolescents or adults. A critical period for literacy development is before 8 years of age (Nevills & Wolf, 2009).

AGENDA



1. A FRAMEWORK FOR UNDERSTANDING DYSLEXIA TO INFORM PROFILING OR DIAGNOSTIC ASSESSMENT
2. ASSESSMENT OVERVIEW
3. TYPES OF ASSESSMENTS: SCREENING & DIAGNOSTIC
4. SELECTING APPROPRIATE TOOLS TO PROFILE OR DIAGNOSE ADYSLEXIA
5. ASSESSMENT CONCLUSIONS & RECOMMENDATIONS

FRAMEWORK FOR UNDERSTANDING DYSLEXIA TO INFORM ASSESSMENT

CAUSAL CHAIN MODEL FRAMEWORK AREAS TO CONSIDER & ASSESS FOR DYSLEXIA WITHIN FRITH MODEL (Adapted from Phillips & Kelly, 2013)

ENVIRONMENT

- CULTURAL ATTITUDE & SOCIO-ECONOMIC FACTORS
- MALNUTRITION
- FAMILY: SUPPORT, INVOLVEMENT & EXPOSURE TO LANGUAGE & READING MATERIAL
- SCHOOL: QUALITY & AVAILABILITY OF TEACHING
- SOCIAL-EMOTIONAL: MOTIVATION/PERSEVERANCE
- ORTHOGRAPHY:SHALLOW/DEEP

BIOLOGICAL (GENETIC OR NEURO-ANATOMICAL)

- FAMILY HISTORY OF DYSLEXIA; PRE-NATAL & BIRTH EXPERIENCES; HISTORY CHRONIC EAR INFECTIONS OR OTHER HEALTH ISSUES
- ATTENTION, ADD/ADHD, DELAYS IN LANGUAGE OR MOTOR SKILLS

COGNITIVE

- ORAL LANGUAGE
- PHONEMIC AWARENESS
- PHONOLOGICAL MEMORY & AUDITORY WORKING MEMORY
- SPEED OF PROCESSING & RAPID AUTOMATIC NAMING

BEHAVIOURAL/ACADEMIC

- PHONICS, DECODING
- ORTHOGRAPHIC MAPPING, AUTOMATICITY
- ORAL READING FLUENCY
- READING COMPREHENSION
- WRITTEN LANGUAGE & SPELLING
- NUMERACY

Frith 1999

ASSESSMENT OVERVIEW

ASSESSMENT OVERVIEW

- REFERRAL REASON & DETAILED BACKGROUND INFORMATION PROVIDES THE CONTEXT & INFORMS
- AREAS TO ASSESS + CONCLUSIONS
- COGNITIVE PROCESSING SKILLS
- ACADEMIC SKILLS
- CONCLUSIONS – PROFILE OF RESULTS: STRENGTHS & WEAKNESSES + DIAGNOSTIC DECISIONS
- RECOMMENDATIONS FOR REMEDIATION & ACCOMMODATIONS
- COGNITIVE PROCESSING SKILLS
- ACADEMIC SKILLS

ASSESSMENTS

- DISCREPANCY MODEL IS CONTROVERSIAL.
- IQ TESTS ARE NOT REQUIRED TO MAKE A DIAGNOSIS (IDA & DSM-V).

IQ TESTS ARE NOT:

- CORRELATED WITH WORD LEVEL READING
- PREDICTIVE OF RESPONSE TO INTERVENTION
- CORRELATED WITH PHONOLOGICAL AWARENESS SKILLS – A CORE DEFICIT.
- IQ CAN BE INFLUENCED BY READING EXPERIENCE ESPECIALLY VOCABULARY & INFORMATION.
- IN YOUNG CHILDREN THERE IS OFTEN NOT ENOUGH OF A DISCREPANCY & BE MISSED.

(KILPATRICK, 2015, SHAYWITZ, 2005).

INDICATIONS OF INTELLECTUAL ABILITY:

- FOR YOUNGER CHILDREN PARENT: LANGUAGE DEVELOPMENT TEACHERS LEARNING ABILITY.
- FOR OLDER CHILDREN/ADULTS, LEVEL OF EDUCATIONAL OR PROFESSIONAL ATTAINMENT MAY BE INDICATIVE

(SHAYWITZ, 2005).

POINTS TO REMEMBER

ASSESS WITHIN A THEORETICAL FRAMEWORK & HAVE SOLID UNDERSTANDING ABOUT READING ACQUISITION & READING DIFFICULTIES.

Kilpatrick 2015

OBSERVATIONS & RECORDING OF RESPONSES FOR LATER ERROR ANALYSIS IS CRITICAL!
DYNAMIC ASSESSMENT TEST-TEACH-TEST MEASURES POTENTIAL TO LEARN

"THINK DIFFERENTLY ABOUT HOW TO INTERPRET NORMATIVE SCORES ON READING-RELATED TESTS"

Kilpatrick 2015:152

THERE IS NO SINGLE TEST & NO ABSOLUTE CRITERIA FOR DIAGNOSING DYSLEXIA

Wolf 2008

USE MULTIPLE SUBTESTS OF THE SAME SKILL FROM DIFFERENT BATTERIES

Kilpatrick 2015

TYPES OF ASSESSMENTS

SCREENING ASSESSMENTS/PROFILING

- IDENTIFY STUDENTS AT RISK, MONITOR PROGRESS & DETERMINE WHO NEEDS MORE INTENSIVE INTERVENTION & WHO NEEDS MORE IN-DEPTH DIAGNOSTIC TESTS.
- UNIVERSAL – INCLUDES ALL CHILDREN.
- SHORT, GROUP / INDIVIDUALLY ADMINISTERED.
- FOCUS ON SPECIFIC CORE SKILLS IDENTIFIED AS PREDICTORS OF READING.
- DEGREE OF ERROR THAT RESULTS IN A % OF FALSE POSITIVES & FALSE NEGATIVES.

DIAGNOSTIC ASSESSMENTS

- IDENTIFY NATURE OF THE READING DIFFICULTY TO PROVIDE EXPLICIT TARGETED INTERVENTION, INCLUDING PLACEMENT OR OTHER SUPPORTS SUCH AS ACCOMMODATIONS – MORE COMPREHENSIVE.
- LENGTHY & ADMINISTERED INDIVIDUALLY TO SPECIFIC STUDENTS.
- NORM REFERENCED & STANDARDISED ON CLEARLY DEFINED GROUP RANGES & BASED ON STANDARD SCORES & PERCENTILES – NOT USE AGE/GRADE BASED (JUST APPROXIMATIONS).
- EXTENSIVE USE OF A VARIETY OF ASSESSMENT TOOLS.
- PREDICTIVE - USE RELIABLE & VALID MEASURES.

COMMONLY USED TESTS FOR SCREENING & DIAGNOSIS

SCREENING TESTS, NON-STANDARDISED

- PHONOLOGICAL AWARENESS SCREENING TEST (PAST)*. GRD R - GRD 3

SCREENING TESTS: STANDARDISED WITH RELIABILITY & VALIDITY MEASURES

- DYNAMIC INDICATORS OF BASIC EARLY LITERACY SKILLS (DIBELS-8)* GRD R - GRD 8
- DYSLEXIA SCREENING TESTS: DEST-2; DST-J; DST-S; DAST AGES 4 – 16.5+
- EARLY GRADE READING ASSESSMENT (EGRA) *IN PROCESS* GRD 1 - GRD 3
- WIAT-III^{UK} DYSLEXIA INDEX SCORE GR R & GR 1; GR 2 +

DIAGNOSTIC TESTS: STANDARDISED WITH RELIABILITY & VALIDITY MEASURES

- WECHSLER INDIVIDUAL ACHIEVEMENT TEST (WIAT-III^{UK}) AGES 4 - 25. 11+
- COMPREHENSIVE TEST OF PHONOLOGICAL PROCESSING (CTOPP-2)** AGES 4 - 24. 11
- TEST OF WORD READING EFFICIENCY (TOWRE-2)** AGES 6 - 24.11
- YORK ASSESSMENT OF READING FOR COMPREHENSION (ARC-Y2) AGES 4 -18 YEARS
- * *FREELY AVAILABLE ONLINE*

** *CO-NORMED ON THE SAME POPULATION GROUP*

COMMONLY USED TESTS FOR SCREENING & DIAGNOSIS

SCREENING TESTS, NON-STANDARDISED		
PHONOLOGICAL AWARENESS SCREENING TEST	PAST *	GR R - GR 3
SCREENING TESTS: STANDARDISED WITH RELIABILITY & VALIDITY MEASURES		
DYNAMIC INDICATORS OF BASIC EARLY LITERACY SKILLS	DIBELS-8 *	GR R - GR 8
DYSLEXIA SCREENING TESTS	DEST-2; DST-J; DST-S; DAST	AGES 4 – 16.5+
EARLY GRADE READING ASSESSMENT	EGRA	GR 1 - GR 3
WIAT-III^{UK} DYSLEXIA INDEX SCORE		GR R & GR 1; GR 2 +
DIAGNOSTIC TESTS: STANDARDISED WITH RELIABILITY & VALIDITY MEASURES		
WECHSLER INDIVIDUAL ACHIEVEMENT TEST	WIAT-III^{UK}	AGES 4 - 25. 11+
COMPREHENSIVE TEST OF PHONOLOGICAL PROCESSING	CTOPP-2 **	AGES 4 - 24. 11
TEST OF WORD READING EFFICIENCY	TOWRE-2 **	AGES 6 - 24.11
YORK ASSESSMENT OF READING FOR COMPREHENSION	YARC-2	AGES 4 -18 YEARS

* *Freely available online * co-normed on the same population group*

ASSESSMENT OF COGNITIVE PROCESSING CORRELATES OF DYSLEXIA

- ORAL LANGUAGE
- PHONOLOGICAL AWARENESS
- PHONOLOGICAL MEMORY
- AUDITORY WORKING MEMORY
- RAPID AUTOMATIC NAMING

ORAL LANGUAGE

- FOUNDATION FOR ALL LEARNING & LITERACY.
- VOCABULARY SIZE IS A MAJOR CORRELATE OF READING COMPREHENSION.
- THE RELATIONSHIP BETWEEN THE TWO IS RECIPROCAL.

DEFICIT

- IMPACT LEARNING TO READ AND IN TURN READING TO LEARN.
- LISTENING & READING COMPREHENSION, SPELLING & WRITTEN EXPRESSIVE LANGUAGE.

TESTS OF ORAL LANGUAGE

GRADE 00 ONWARDS

- LISTENING COMPREHENSION
- RECEPTIVE & EXPRESSIVE LANGUAGE
- VOCABULARY & BASIC CONCEPTS
- GENERAL KNOWLEDGE

SET FOR VARIABILITY (Kilpatrick, 2015)

VARIABLE	GRADE 4 - A	GRADE 4 - B
WISC-V^{UK}		
VERBAL COMPREHENSION INDEX	**113**	89
WIAT-III^{UK}		
PSEUDOWORD DECODING	**81**	**81**
WORD READING	98	80

PHONOLOGICAL AWARENESS

- KEY DEFICIT & EARLY MARKER OF DYSLEXIA.
- MOST COMMON CAUSE OF DYSLEXIA – CORE PHONOLOGICAL DEFICIT – UP TO 80% (SHAYWITZ, 2005)
- ABILITY TO HEAR, IDENTIFY & MANIPULATE SOUNDS OF SPOKEN LANGUAGE: SENTENCE, WORD, SYLLABLE
- SOUND LEVEL - PHONEMIC AWARENESS: D/O/G
- DEVELOPS PREDICTABLE SEQUENCE – GOOD READERS EFFORTLESSLY.
- STRONG EVIDENCE DIRECTLY LINKED TO L-S KNOWLEDGE & EASE OF LEARNING TO READ.
- RECIPROCAL RELATIONSHIP: PA & READING DEVELOPMENT.

TESTS OF PHONOLOGICAL AWARENESS

Grade 00 onwards

- **ORALLY ADMINISTERED** – SOME PICTURE SUPPORT FOR YOUNGER CHILDREN.

- **EARLY** = IDENTIFYING RHYMING, SENTENCES, WORDS, FIRST SOUNDS & MANIPULATING SYLLABLES.
- **BASIC** = PHONEME BLENDING & SEGMENTING.
- **ADVANCED** = MANIPULATING PHONEMES: DELETING, SUBSTITUTING OR REVERSING. GR3/4

- **MANIPULATING TASKS** ARE THE MOST SENSITIVE PA SKILL FOR READING DEVELOPMENT SKILLS OF SEGMENTATION, ISOLATION & BLENDING: CTOPP-2 NOT *DIBELS PSF*

- **TIMED TASKS** CAN DISTINGUISH BETWEEN PROFICIENCY/AUTOMATICITY & DIFFICULTIES: (KILPATRICK, 2015). AUTOMATICITY = IMMEDIATELY WITHOUT USING ANY EFFORT. PAST

IMPLICATION

- EXPLICIT & INTENSIVE INSTRUCTION TO CONSOLIDATE, BEFORE FORMAL LEARNING OF READING. (BRADLEY & BRYANT, 1985, KILPATRICK,2015) POWERFUL INFLUENCE ON LATER READING DEVELOPMENT & PREVENT LATER READING DIFFICULTIES – 50-75% OF GR R & GR 1.

COMPREHENSIVE TEST OF PHONOLOGICAL PROCESSING-2 (WAGNER, TORGESEN, RASHOTTE & PEARSON, 2013)

PHONOLOGICAL AWARENESS

4-6 YEARS

SOUND MATCHING

MATCH WORDS WITH THE SAME INITIAL & FINAL SOUNDS WITH PICTURES

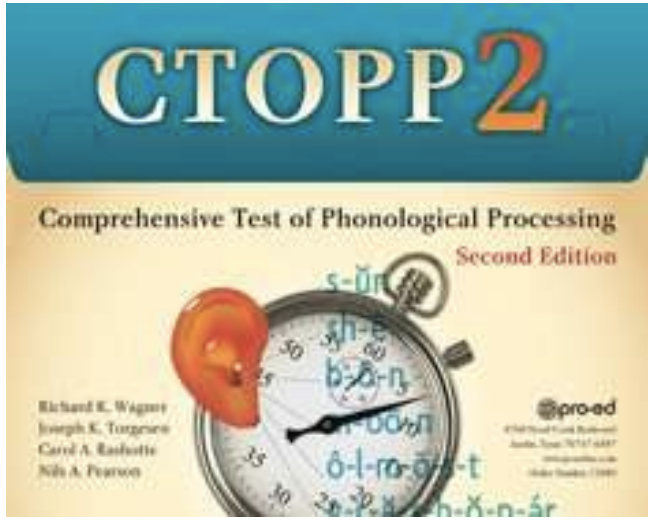
WHICH WORD ENDS WITH THE SAME SOUND AS **ROB**?

KNOT RAIN TUB

7-24 YEARS

PHONEME ISOLATION ISOLATING INDIVIDUAL SOUNDS WITHIN WORDS

WHAT IS THIRD SOUND IN **PAINT**?



ELISION

REMOVING PHONOLOGICAL SEGMENTS

COW-GIRL; **SPI-**DER;

C-**UP;** MIKE-**MY;** SNAIL-**SAIL;**

TIGER-**TIRE**

BLENDING WORDS

COMBINING SOUNDS TO FORM NONWORDS & WORDS

NUM-BER-**NUMBER;**

S-UN-**SUN;** T-OI-**TOY**

PHONOLOGICAL AWARENESS SCREENING TEST

TESTS DEVELOPMENT OF PHONOLOGICAL AWARENESS

AVAILABLE FREE ONLINE WITH INSTRUCTIONS ON ADMINISTERING SCORING & INTERPRETING

RHYMING AWARENESS
DELETION OF SYLLABLES, INITIAL, FINAL & MEDIAL PHONEMES

5 VERSIONS FOR PERIODIC MONITORING

CORRECT + AUTOMATICITY SCORES

(Kilpatrick, 2016)

PHONOLOGICAL MEMORY

- STORE AUDITORY/VERBAL INFORMATION OVER SHORT PERIOD TIME - RELATED TO STM.

DEFICIT

- IMPAIR DECODING & ENCODING OF NEW WORDS FOR READING & SPELLING – HOLDING LETTERS TOGETHER TO FORM WORDS.
- IMPACT PHONOLOGICAL AWARENESS TASKS.

TESTS OF PHONOLOGICAL MEMORY

GRADE 00

- REPETITION OF DIGITS, WORDS, NONWORDS OR SENTENCES.
- NB TO PACE WHEN ADMINISTERING – ONE SECOND PAUSE BTW – SO DO NOT GIVE ACOUSTIC CLUES WHICH WILL HELP RECALL.

AUDITORY WORKING MEMORY

- Hold & manipulate information mentally over short periods of time & then produce an output.
- Sensitive to inattention, anxiety & fatigue.

Deficit

- Phonological Awareness.
- Sustained attention.
- Decoding, encoding of words & numeracy.
- Listening & reading comprehension.

TESTS OF AUDITORY WORKING MEMORY

GRADE 00

- DIGIT SPAN – DIGITS REVERSED (*DSB*) OR SEQUENCED (*DSS*).
- WORD OR OTHER ITEMS IN A PARTICULAR SEQUENCE.
- RESEARCH SUGGESTS: *DSF* IS MORE SUSCEPTIBLE TO EFFECTS OF ANXIETY THAN *DSB* & *DSS*.

RAPID AUTOMATIC NAMING

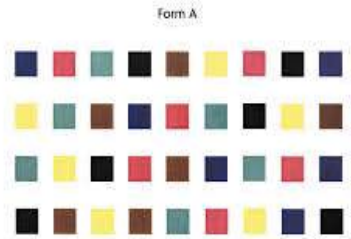
- RAPIDLY RETRIEVE FAMILIAR VERBAL LABELS FROM LTM IN RESPONSE TO A SEQUENCE OF VISUAL STIMULI.
- HIGHLY CORRELATED WITH VISUAL-VERBAL PROCESSING.

DEFICIT

- IMPAIR READING ACCURACY & FLUENCY.
- ONE OF THE BEST PREDICTORS OF READING FLUENCY (WOLF, 2008).
- DOUBLE DEFICIT: PA + RAN = MORE SEVERE READING PROBLEM.

TESTS OF RAPID NAMING

GRADE 00 ONWARDS



- RAN MEASURES.
- ABILITY TO QUICKLY NAME ALOUD, FROM MEMORY FAMILIAR
- OBJECTS & COLOURS [YOUNGER CHILDREN] DIGITS & LETTERS [OLDER CHILDREN]
- (ORTHOGRAPHIC PROCESSING LAYER). RAN/RAS DIBELS *LNF*
- WITH INTENSIVE PA TRAINING & READING IMPROVEMENTS, PROBLEMS WITH
- RAN PARTIALLY RESOLVE THEMSELVES (KILPATRICK,2015).

BUILDING A BATTERY OF COGNITIVE PROCESSING SKILLS TO ASSESS FOR DYSLEXIA

PROCESSING AREA	CTOPP-2	WIAT-III	WISC-5	YARC	NEPSY	OTHER
ORAL LANGUAGE		LISTENING COMPREHENSION ORAL EXPRESSION	VOCABULARY GENERAL INFORMATION COMPREHENSION SIMILARITIES		COMPREHENSION OF INSTRUCTIONS VERBAL FLUENCY	BSSI BOEHM-3 TEST OF BASIC CONCEPTS
PHONOLOGICAL AWARENESS	ELISION BLENDING WORDS PHONEME ISOLATION (SOUND MATCHING)			SOUND ISOLATION SOUND DELETION	PHONOLOGICAL PROCESSING	PAST DIBELS PHONEMIC SEGMENTATION FLUENCY
PHONOLOGICAL MEMORY	PHONOLOGICAL MEMORY	SENTENCE REPETITION	DIGIT SPAN FORWARD		REPETITION NONSENSE WORDS	
AUDITORY WORKING MEMORY			DIGIT SPAN BACKWARDS, DIGIT SPAN SEQUENCING LETTER-NUMBER SEQUENCING			DST-J BACKWARD DIGIT SPAN
RAPID NAMING	RAPID NAMING				SPEEDED NAMING	RAN/RAS

ASSESSMENT OF ACADEMIC SKILLS

- Phonics
- Phonological Decoding
- Orthographic Mapping
- Oral Reading Fluency
- Reading Comprehension
- Written Language
- Numeracy

PHONICS

- MAP SOUNDS TO LETTERS FLUENTLY & RAPIDLY REGARDLESS OF FONT, CASE & STYLE.
- BASED ON VISUAL-PHONOLOGICAL PAIRED-ASSOCIATE LEARNING.
- LINKED TO ALPHABETIC PRINCIPLE – INSIGHT THAT A SPEECH SOUND/PHONEME CAN BE REPRESENTED BY LETTER/S & VICE VERSA.
- RESEARCH INDICATES THAT LETTER NAMES ARE USEFUL IN HELPING TO LEARN LETTER SOUNDS (IN KILPATRICK, 2015).
- LETTERS WHOSE SOUNDS FIRST PHONEME IN THE LETTER'S NAME ARE EASIER TO LEARN (B,D,J,K,P,T,V,Z) THAN THOSE WHOSE SOUNDS ARE EMBEDDED IN THE LETTER'S NAME (F,L,M,N,R,S,X), FOLLOWED BY THOSE WHOSE SOUNDS ARE NOT CONTAINED IN NAME (H,W,Y).

DEFICIT:

- IMPAIR BEGINNER READING.
- THOSE WITH WEAK PHONOLOGICAL AWARENESS SKILLS WILL TAKE LONGER, THAN TYPICALLY DEVELOPING READERS TO LEARN LETTER NAMES & SOUNDS.

TESTS OF PHONICS

GRADE R ONWARDS

- LETTER-NAME KNOWLEDGE
- LETTER-SOUND KNOWLEDGE

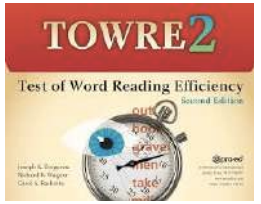
PHONOLOGICAL DECODING

- WORD ATTACK SKILLS – INVOLVING SEGMENTING, MAPPING & BLENDING SOUNDS TOGETHER.
- ACTIVATE PHONOLOGICAL & SEMANTIC REPRESENTATION LTM.
- DEPENDENT ON PHONOLOGICAL AWARENESS.

DEFICIT

- IMPAIR READING OF NEW WORDS.
- POOR READERS MAY REMAIN SLOW DECODERS WHICH WILL IMPACT THEIR READING COMPREHENSION.

TESTS OF PHONOLOGICAL DECODING



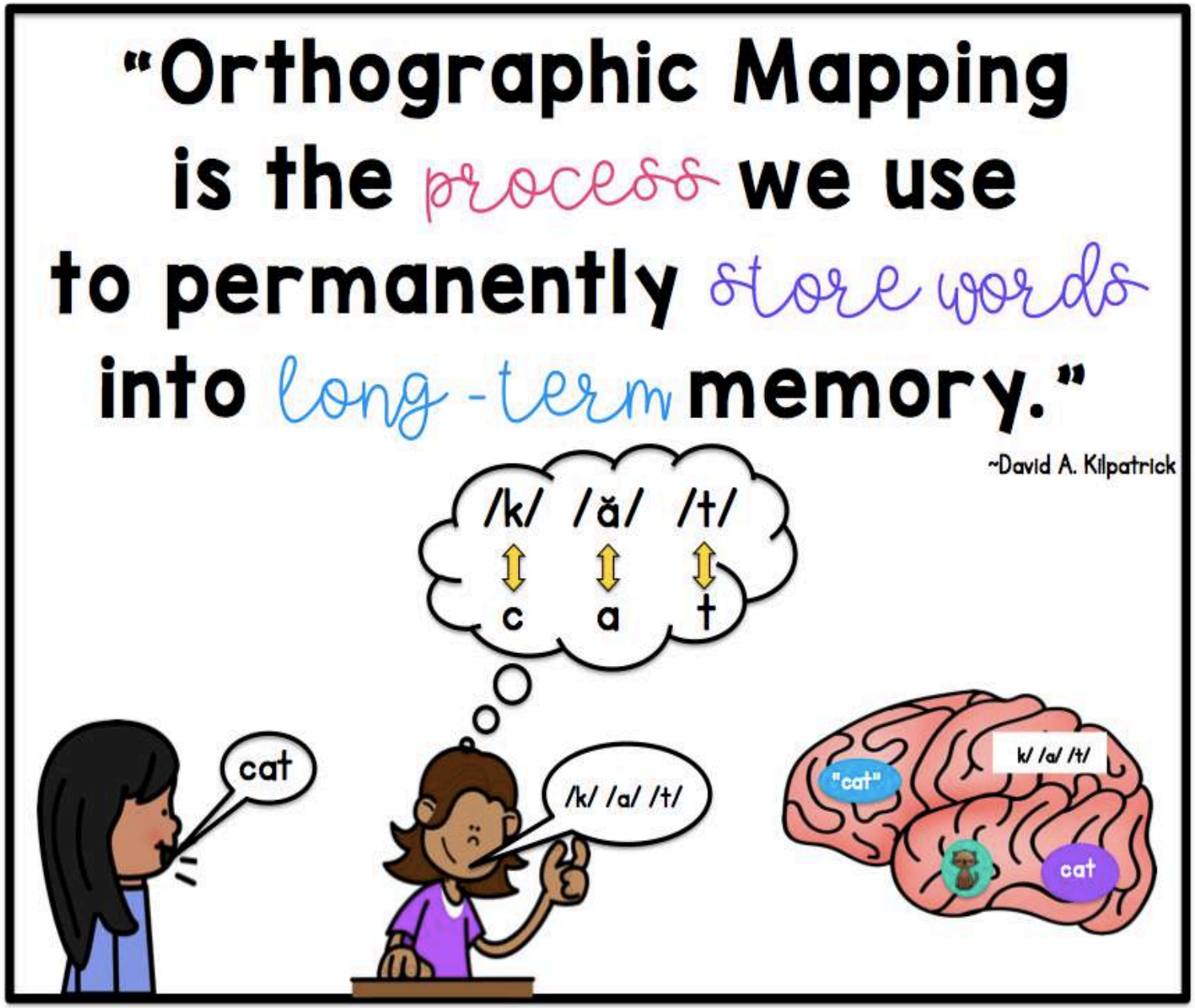
MID - GRADE 1 ONWARDS

- NONWORDS = PUREST MEASURE. WIAT-III *PSEUDOWORD DECODING*
- UNCOMMON REGULAR WORDS.
- INCLUDE TIMED TASKS TO DETERMINE AUTOMATICITY, BUT AFTER UNTIMED – CHILD MAY RUSH.
- SUPPLEMENT TESTS WITH SCREENING TESTS AS SECONDARY DATA SOURCES. *NWF*
- **JOOM – JAM;** **CLATCH – CATCH**
- **RADIANT – RADI-AINT;** **DISTANCE – DIST-AY-NCE**

DIBELS 8TH
UNIVERSITY OF OREGON College of Education

PHONOLOGICAL PROCESSING & PSEUDOWORD DECODING

VARIABLE	GARY 13 Y 9 M	TREVOR 12 Y 10 M
PHONOLOGICAL AWARENESS		
ELISION	**7**	11
PHONEME ISOLATION	9	10
BLENDING WORDS	13	15
PHONOLOGICAL MEMORY		
MEMORY FOR DIGITS	**6**	10
NONWORD REPETITION	10	14
RAPID NAMING		
RAPID DIGIT NAMING	10	9
RAPID LETTER NAMING	11	11
WIAT-III^{UK}		
PSEUDOWORD DECODING	**78**	**88**


"Orthographic Mapping is the process we use to permanently store words into long-term memory."
~David A. Kilpatrick
/k/ /ă/ /t/
c a t
cat
/k/ /a/ /t/
"cat"
k/ /a/ /t/
cat

ORTHOGRAPHIC MAPPING

- ENABLES RAPID RECOGNITION, PRONUNCIATION & ACCESS TO MEANING OF WORDS & PARTS OF WORDS, NUMBERS & SYMBOLS.
- **DEFICIT**
- STRUGGLE TO FLUENTLY RECOGNISE SIGHT WORDS, IRREGULAR WORDS & REGULAR WORDS.
- RELY EXTENSIVELY ON PHONOLOGICAL DECODING & READ SLOWLY.
- **B – D SAW – WAS TOUGH – TAUGHT**
- IMPAIR READING COMPREHENSION – AS AUTOMATIC WORD RECOGNITION IS A PREREQUISITE.

- **TEST OF ORTHOGRAPHIC MAPPING**
- MID - GRADE 1 ONWARDS
- READING IRREGULAR WORDS. DOWNLOADS, YARC – EARLY READING
- READING WORD LISTS – NB ANALYSE ERRORS. WIAT-III *WORD READING*
- TIMED GRADED WORD LISTS – PROFICIENCY IN INSTANT WORD TOWRE-2 *SIGHT WORD EFFICIENCY* DIBELS *WRF*

WHY TIMED READING TESTS?

VARIABLE	JESSICA 12 Y 4 M	DAVID 13 Y 9 M
WIAT-III^{UK}		
PSEUDOWORD DECODING	83	98
WORD READING	87	100
TOWRE-2		
SIGHT WORD EFFICIENCY	76	87
PHONEMIC DECODING EFFICIENCY	79	90

ORAL READING FLUENCY

- READ CONNECTED TEXT EFFORTLESSLY: SPEED, ACCURACY, PROSODY.
- AUTOMATICITY FREES UP COGNITIVE RESOURCES SUCH AS WORKING MEMORY & ATTENTION FOR COMPREHENSION.
- FLUENCY IS A BY-PRODUCT OF THE SIZE OF SIGHT WORDS THAT CAN BE READ INSTANTLY.

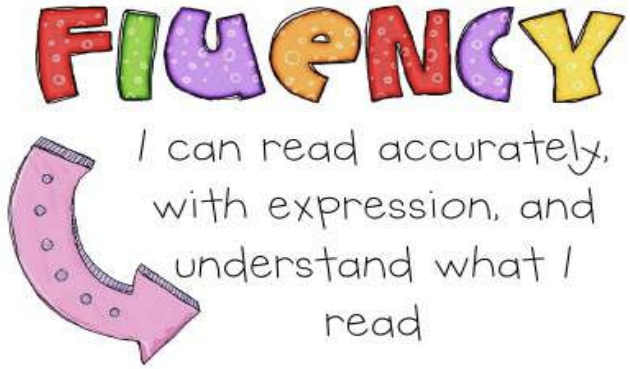
DEFICIT

- READING SLOW & EFFORTFUL, HESITANT, REPETITIVE, SELF-CORRECTIONS, INSERTIONS & OMISSIONS OF WORDS.
- COMPREHENSION POOR.

TESTS OF ORAL READING FLUENCY

MID GRADE 1 ONWARDS

- SENTENCE OR PASSAGE READING FLUENCY TESTS



Close Reading Is Deep Reading:

Each time we read, we dig a little deeper into the text.

READING COMPREHENSION

- EXTRACT MEANING FROM TEXT.
- ACTIVATION & COORDINATION OF MULTIPLE OPERATIONS PERFORMED SIMULTANEOUSLY:

    WORD IDENTIFICATION

    USING CONTEXTUAL CUES

    EXTRACTING MAIN IDEA

    INFERENCE

    VOCABULARY

    BACKGROUND KNOWLEDGE

    EXECUTIVE FUNCTIONS ATTENTION & WORKING MEMORY.

DEFICIT

COMPROMISE READING COMPREHENSION AT WORD, SENTENCE OR PASSAGE LEVEL. ANY OF THE SKILLS MENTIONED ABOVE CAN IMPACT.

TESTS OF READING COMPREHENSION

MID GRADE 1 ONWARDS

- ORAL READING OF PASSAGES – ACCURACY, RATE & COMPREHENSION.
- SILENT READING OF PASSAGES & ANSWERING COMPREHENSION QUESTIONS.
- LITERAL TO INFERENTIAL QUESTIONS.
- MAZE TASKS – EVERY 7TH WORD REMOVED & CHOOSE 1 OF 3 POSSIBLE OPTIONS TO REPLACE.
- POOR READERS OFTEN DO BETTER ON SILENT READING COMPREHENSION MEASURES, AS OPPOSED TO ORAL DECODING TESTS OF WORDS IN ISOLATION (SHAYWITZ, 2003).

- DEN – BEN MAN – NAN SHIN - CHIN

  VISUAL CONFUSION BETWEEN SIMILAR LOOKING LETTERS

- HAND – WRIST BOAT – SHIP

  SEMANTIC ERRORS – OVER RELIANCE ON CONTEXT

- SPOON - SPIN DETEST - DENTIST BROAN – BRAIN

  SUBSTITUTION ERRORS BASED ON INITIAL & FINAL LETTER – IGNORING INTERNAL DETAIL

- NO - ON WAS - SAW LOOSES PLACE

  TRANSPOSITION/TRACKING/INVERSION ERRORS

- BEER - /B//EH//EH//R/ VICINITY – VICKINITY DEPUTY – DEPOOTY

  MISPRONUNCIATION / REGULARISATION ERRORS, OVER RELIANCE ON LETTER-SOUND CORRESPONDENCE RULES

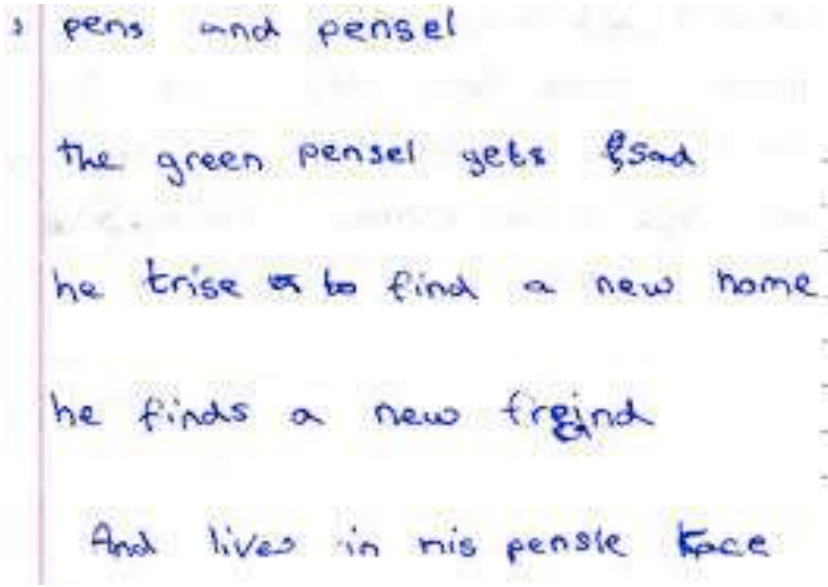
SPELLING & WRITTEN LANGUAGE

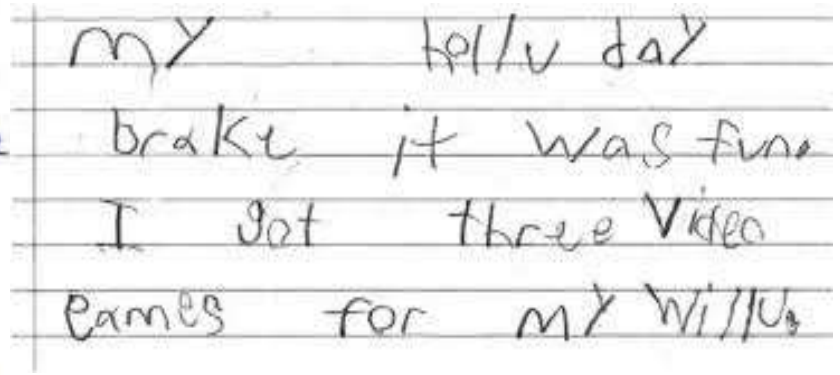
- ABILITY TO SPELL WORDS & EXPRESS ONESELF IN WRITING OF SENTENCES & PARAGRAPHS.
- SPELLING = LANGUAGE WRITTEN DOWN (MOATS, 2020) DIFFICULTIES - COULD BE DUE TO ORTHOGRAPHIC OR PHONOLOGICAL PROCESSING PROBLEMS.
- ABILITY TO EXPRESS ONESELF IN WRITING BY INTEGRATING VARIOUS PROCESSES SIMULTANEOUSLY
    - ORGANISATION
    - THEME DEVELOPMENT
    - SENTENCE CONSTRUCTION
    - SENTENCE COMPLEXITY
    - GRAMMAR
    - PUNCTUATION
    - LEGIBLE HANDWRITING.

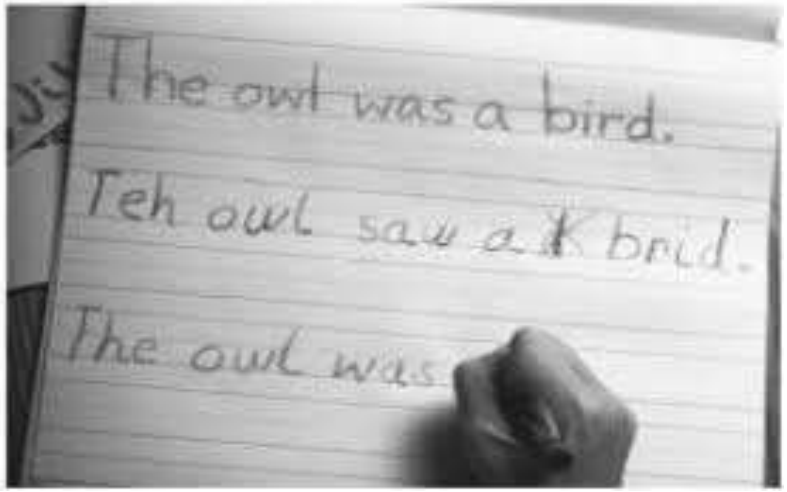
TESTS OF WRITTEN LANGUAGE

MID GRADE 1 ONWARDS

- COPYING - TIMED
- SPELLING REAL WORDS
- WRITING SAMPLES: COMBINING SENTENCES, SENTENCES & ESSAYS







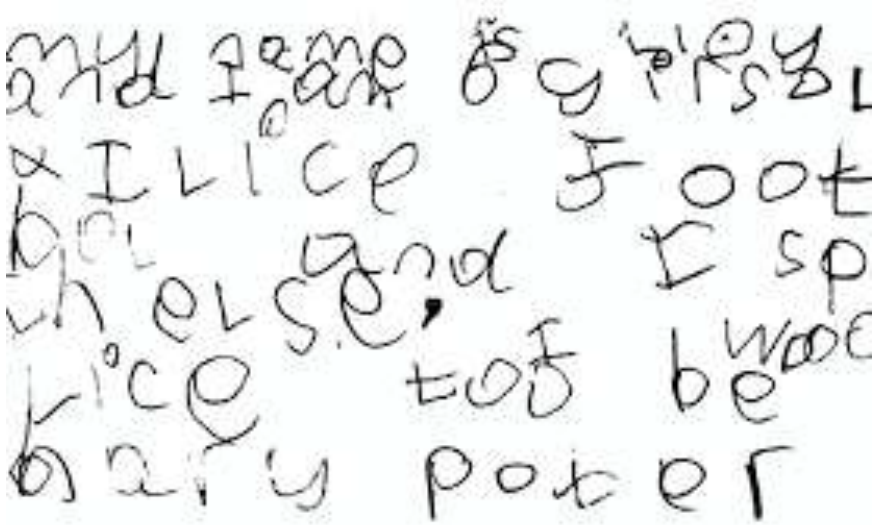
PHONETIC, PUNCTUATION & TRANSPOSITION ERRORS

AUDITORY (VOWEL) & HOMOPHONE CONFUSION, LETTER REVERSAL, UPPER & LOWER CASE

TRANSPOSITION/TRACKING ERRORS INCONSISTENCIES

Dysgraphia Defined

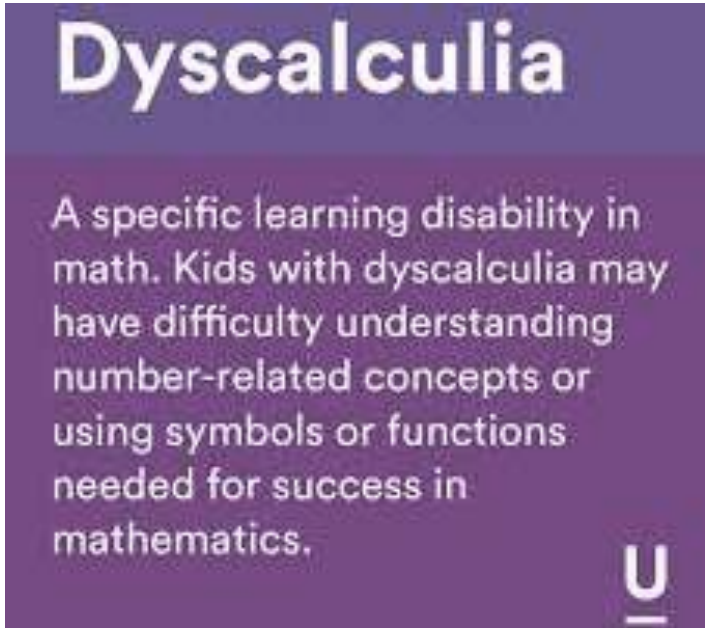
- a specific learning disability in which the ability to express oneself through written language is impaired. Simply put, dysgraphia describes difficulty with writing. Dysgraphia is not the result of an intellectual impairment, nor is it dependent upon your ability to read. Dysgraphia has the potential to cause problems with spelling, organizing words on a page, and putting your thoughts on paper.



POOR SPATIAL ORGANIZATION, PHONETIC SPELLING, HANDWRITING: ACCOMMODATION OF A SCRIBE

NUMERACY

- ABILITY TO UNDERSTAND & WORK WITH NUMBERS: TO REASON WITH NUMBERS, CONDUCT CALCULATIONS & APPLY NUMERICAL CONCEPTS IN A WIDE RANGE OF SITUATIONS BEGINNING WITH COMPREHENDING FUNDAMENTAL ARITHMETIC LIKE +, -, X & -.
- WORKING MEMORY & ATTENTION ARE INVOLVED.
- HIGH LEVELS OF MATHEMATICS ANXIETY.



Tests of Numeracy

Grade R onwards

- Basic understanding quantity, recognising digits & matching concrete object to digits.
- Calculations – ability to do math operations - most tests are untimed.
- Mathematical Reasoning – problems are read aloud to the child - solve in head - takes out the reading.
- Mathematical Fluency – ability to easily recall basic math facts: 5 x 3 = 15 (phonological memory or working memory problems).
- Benefit from extra time, calculators, manipulatives (number line) or visual reminders, older students concessions.

TESTS OF NUMERACY GRADE R ONWARDS

- BASIC UNDERSTANDING QUANTITY, RECOGNISING DIGITS & MATCHING CONCRETE OBJECT TO DIGITS.
- CALCULATIONS – ABILITY TO DO MATH OPERATIONS - MOST TESTS ARE UNTIMED.
- MATHEMATICAL REASONING – PROBLEMS ARE READ ALOUD TO THE CHILD - SOLVE IN HEAD - TAKES OUT THE READING.
- MATHEMATICAL FLUENCY – ABILITY TO EASILY RECALL BASIC MATH FACTS: 5 X 3 = 15 (PHONOLOGICAL MEMORY OR WORKING MEMORY PROBLEMS).
- BENEFIT FROM EXTRA TIME, CALCULATORS, MANIPULATIVES (NUMBER LINE) OR VISUAL REMINDERS, OLDER STUDENTS CONCESSIONS.

BUILDING A BATTERY FOR ACADEMIC SKILLS TO ASSESS FOR DYSLEXIA

PROCESSING AREA	WIAT-III	TOWRE-2	YARC	DIBELS	OTHER
PHONICS			LETTER-SOUND KNOWLEDGE	LETTER NAMING FLUENCY	BSSI BRACKEN SCHOOL READINESS ASSESSMENT
PHONOLOGICAL DECODING	PSEUDOWORD DECODING	PHONEME DECODING EFFICIENCY	EARLY WORD RECOGNITION	NONSENSE WORD FLUENCY	
ORTHOGRAPHIC MAPPING	WORD READING	SIGHT WORD EFFICIENCY	EARLY WORD RECOGNITION	WORD READING FLUENCY	
ORAL READING FLUENCY	ORAL READING FLUENCY			ORAL READING FLUENCY	
READING COMPREHENSION	READING COMPREHENSION		ACCURACY RATE COMPREHENSION	MAZE (MULTIPLE CHOICE)	NFER NELSON GROUP READING EDINBURGH READING TEST 4
SPELLING WRITTEN LANGUAGE	ALPHABET WRITING SPELLING SENTENCE & ESSAY COMPOSITION				
NUMERACY	MATH PROBLEM SOLVING NUMERACY MATH FLUENCY			NUMERACY SCREENER	WISC-V ARITHMETIC KEYMATH-3 DIAGNOSTIC ASSESSMENT

CONCLUSIONS & RECOMMENDATIONS

CONCLUSION
OUTCOME OF AN ASSESSMENT

INTEGRATE AVAILABLE INFORMATION IN CONTEXT OF REFERRAL REASON, BACKGROUND INFORMATION, TEST BEHAVIOUR & RESULTS.

BEST PREDICTORS OF READING DIFFICULTIES IN EARLY GRADES
PHONOLOGICAL AWARENESS
RAN
PHONICS
WORKING MEMORY

BEST DIAGNOSTIC INDICATORS ONCE FORMAL READING COMMENCES INCLUDES A WEAKNESS & LACK OF FLUENCY IN
PHONOLOGICAL DECODING
ORAL READING FLUENCY
READING COMPREHENSION

SUMMARISE STRENGTHS & WEAKNESSES.

CONSIDER OVERALL FIT OF INFORMATION WITH TYPICAL PROFILE OF DYSLEXIA.

LINK RESULTS WITH SPECIFIC INTERVENTIONS.

RECOMMENDED REMEDIATION & ACCOMMODATIONS ARE:

- DISTINCT BUT **COMPLEMENTARY** INTERVENTIONS FOR STUDENTS WITH DYSLEXIA.
- **ESSENTIAL** TO ENSURE SCHOOL SUCCESS FOR STUDENTS WITH DYSLEXIA.
- STUDENTS WITH DYSLEXIA ARE **ENTITLED** TO **BOTH.**

REMEDIATION:

- PLACE THE EMPHASIS ON THE STUDENT'S **WEAKNESSES** TO HELP THEM CATCH UP OR NARROW THE GAP.

ACCOMMODATIONS:

- PLACE THE EMPHASIS ON THE STUDENT'S **STRENGTHS** TO BYPASS WEAKNESSES, "BY ALLOWING A STUDENT TO DEMONSTRATE KNOWLEDGE, SKILLS & ABILITIES WITHOUT LOWERING LEARNING OR PERFORMANCE EXPECTATIONS AND WITHOUT CHANGING WHAT IS BEING MEASURED" (IDA, 2019)
- NB TO PUT IN PLACE EARLY IN ORDER TO SUPPORT THE CHILD, WHILST ATTEMPTING TO REMEDIATE, AND NOT MERELY TO APPLY FOR LATER TO STRIVE FOR BETTER MARKS.

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RECOMMENDED REMEDIATION & ACCOMMODATIONS

- **REMEDIATION**
  - SYSTEMATIC, EXPLICIT, SEQUENTIAL EVIDENCE-BASED MULTISENSORY STRUCTURED INTERVENTIONS.
  - TEACH TO MASTERY.
  - INTEGRATE SKILLS.
  - FREQUENT PRACTICE.
  - METACOGNITIVE STRATEGIES.
- **REFERRALS**
  - PSYCHOTHERAPY
  - OPTOMETRIST
  - SPEECH & LANGUAGE THERAPY
  - OCCUPATIONAL THERAPY
  - DEVELOPMENTAL PAEDIATRICIAN
  - CHILD PSYCHIATRIST
  - NEUROLOGIST

- **ACCOMMODATIONS**
- READER
- SCRIBE
- AMANUENSIS
- EXTRA TIME
- KEYBOARD – COMPUTER IPAD
- ASSISTIVE TECHNOLOGY: SPEECH-TO-TEXT SOFTWARE, TEXT-TO-SPEECH SOFTWARE
- C-PEN, WORD PREDICTION, SPELL CHECK
- AUDIOBOOKS
- SEPARATE VENUE – FREE FROM DISTRACTIONS
- DON'T CALL ON THEM TO READ ALOUD UNLESS VOLUNTEER OR PREPARE THEM BEFOREHAND.
- **CLASSROOM STRATEGIES**
- WORKING MEMORY & PROCESSING SPEED

"IT IS NEVER THE FAULT OF THE CHILD, BUT RATHER THE RESPONSIBILITY OF US WHO TEACH TO FIND METHODS THAT WORK FOR THAT CHILD."
-DR. MARYANNE WOLF