

Basic Reading Skills (BRS) Development of Working Hypothesis

Guiding Statement:

Basic reading skills deficits, also known as word-level reading disability or dyslexia, represents approximately 80% of the students with Specific Learning Disabilities. Dyslexia is defined by a weakness in decoding skills at the single word and phoneme level. Due to the cognitive demands created by poor decoding skills, multiple academic domains may be affected. It may occur in conjunction with difficulty in reading fluency and comprehension tasks, as well as spelling and written expression. Basic Reading Skills (dyslexia) deficits may be more phonologically based (phonological or dysphonetic dyslexia) or visually based (orthographic or surface dyslexia) (Feifer, 2007; Mather & Wendling, 2011). These categories relate most specifically to intervention. For example, for phonological processing weaknesses an explicit phonological and phonics program is recommended, whereas for orthographic weaknesses whole word or lexical level strategies are recommended. Some students have mixed phonological and orthographic deficits and these students require balanced literacy intervention including both phonological and phonics instruction and whole word and lexical level strategies. Other core basic psychological processes hypothesized to have a strong relationship with basic reading skills include language, working memory, long-term memory storage and retrieval, and rapid automatic naming. Students with a weakness in working memory would benefit from the use of a multi-sensory reading intervention program.

Purpose:

Formulate hypothesis about the nature of the difficulty.

Basic Reading Skills (BRS): Check box to the right if description applies.

Academic Indicator Descriptions – Phonological	
Problems identifying the sound of a letter	
Problems segmenting and blending two or more sounds	
Difficulty identifying that two words rhyme	
Difficulty identifying phonemes (sounds) within words that slow down word recognition	
Spelling demonstrates pre-phonetic relationships or no phonetic relationship	
Academic Indicator Descriptions – Orthographic	
PreK-2nd Difficulty learning letters, problems naming rapidly all the letters of the alphabet	
K-12 Consistently confuses similarly shaped letters (b/d, p/g, p/q, n/u, m/w)	
K-12 Frequent sight words are not automatically recognized but individual sounds are identified	
K-12 Sounds out every word, even irregular sight words (of, was, light)	
Academic Indicator Descriptions – General	
Higher skill development in areas that are not dependent on reading	
Avoidance or behavior problems when asked to read	
Family history of learning disabilities	

- ☐ Primarily Phonological
☐ Primarily Orthographic
☐ Combination of both types

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty finding the right word to say or slow, labored, or limited amount of speech. Difficulty comprehending language and learning vocabulary.		Language
Frequently asks for directions to be repeated or gets lost in the middle of a problem or assignment. Tendency to lose track when working on sequential activities. Difficulty with multi-tasking.		Working Memory
Does well on daily assignments but doesn't do well on formative assessment/end of week tests. Difficulty recalling facts and related concepts/ideas. Difficulty with memorization. Difficulty with word retrieval.		Long Term Memory
Difficulty hearing words exactly; makes small mistakes in the sounds of words (e.g., "I thought you said,"), difficulty with rhymes and sound discrimination including blending and segmenting.		Phonological Awareness
Takes longer to complete tasks than others the same age. Slow reading speed. Need to reread for understanding.		Processing Speed
Difficulty naming learned numbers, letters, or names quickly, or substitutes the wrong name or word, has words on "the tip of the tongue" but can't remember, takes long pauses in speaking, uses the wrong word or "speaks around" a word or someone's name, has difficulty recalling known words from a particular category.		Speed of Lexical Access
Spells irregular words phonetically rather than by their visual pattern (srkoll for circle).		Orthographic
Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion. Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time.		Executive Functions and Attention

Reading Fluency (RF) Development of Working Hypothesis

Guiding Statement:

Reading fluency is the most recent addition to the classification model in the federal language around Specific Learning Disabilities. Although the measurement of reading fluency is relatively straightforward, it involves a number of processes that are highly correlated. Poor reading fluency may also be primarily caused by word-level reading and phonological deficits, although evidence for a fluency-only subtype of learning disability does exist. Basic psychological processes primarily involved in reading fluency include attention, language, memory and learning (working memory, long-term memory retrieval, rapid naming), metacognition, and speed of cognitive processing. For students who exhibit a weakness in the area of fluency and/or processing speed, a reading fluency intervention (e.g. Read Naturally) is recommended. If the student is exhibiting a weakness in their accuracy as well as their fluency, they should be provided with fluency level intervention at their 92-95% accuracy level along with basic reading skills instruction to increase accuracy. For students who exhibit a weakness in their working memory, a multi-sensory based reading intervention is recommended in addition to reading fluency interventions.

Purpose:

Formulate hypothesis about the nature of the difficulty and develop an intervention and progress monitoring plan across all tiers of support and assist in determining if a learning disability is suspected.

Reading Fluency (RF): Check box to the right if description applies.

Academic Indicator Descriptions – Accuracy	
Problems accurately identifying individual letters	
Substitution of words	
Difficulty using context to correctly identify words	
Frequently guesses at words	
Makes careless errors	
Missing phonemes in the middle or end of words	
Problems with reading words in isolation	
Academic Indicator Descriptions – Fluency	
Problems quickly associating a letter with a sound	
Increased effort when naming letters	
Frequent pauses in between words in connected text	
Difficulty reading simple connecting or function words such as <i>that, an, in, the, etc.</i>	
Oral reading that is choppy or dysfluent	
Problems with reading words in isolation	
Inability to finish reading tasks or tests in a reasonable amount of time	
General	
Family history of learning disability	

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty finding the right word to say or slow, labored, or limited amount of speech		Language
Frequently asks for directions to be repeated or gets lost in the middle of a problem		Working Memory
Does well on daily assignments but doesn't do well on formative assessment/end of week tests		Long Term Memory
Takes longer to complete tasks than others the same age. Slow reading speed. Need to reread for understanding		Processing Speed
Difficulty naming learned numbers, letters or names quickly, or substitutes the wrong name or word, has words on "the tip of the tongue" but can't remember, takes long pauses in speaking, uses the wrong word or "speaks around" a word or someone's name, has difficulty recalling known words from a particular category		Speed of Lexical Access
Spells irregular words phonetically rather than by their visual pattern		Orthographic
Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time. Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion		Attention and Executive Functions

Reading Comprehension (RC) Development of Working Hypothesis

Guiding Statement:

For the majority of students, reading comprehension problems are related fundamentally to decoding problems at the individual word level. For example, many students age six to eight, phonemic awareness deficits may impact basic reading skills and therefore affect reading comprehension. In later teen years, students with auditory processing problems may also experience difficulty with subject area vocabulary and reading comprehension. Nevertheless, there is evidence that a percentage of students demonstrate poor comprehension despite adequate decoding ability (Catts, 2003). Students with poor reading comprehension may lack not only poor decoding, but also comprehension in oral listening tasks and/or written language (Berninger, 2007). Poor fluency with reading tasks can also negatively impact overall comprehension. Therefore, it is unlikely that any single underlying source may be solely attributed to poor reading comprehension (Cain, 2006). Core basic psychological processes contributing to reading comprehension may include attention, language use (including listening comprehension and vocabulary development), memory and learning (e.g., working memory), metacognition, problem-solving/judgment (including making inferences and deductions), and processing speed. Students with a weakness in the area of language would benefit from systematic and explicit reading comprehension interventions that incorporate language including semantic, morphological, and syntactic awareness instruction. Student with a weakness in the area of working memory, attention, and executive functions would benefit from a multi-sensory reading comprehension intervention.

Purpose:

Formulate hypothesis about the nature of the difficulty.

Reading Comprehension (RC): Check box to the right if description applies.

Difficulty understanding oral directions at an age/grade appropriate level	
Uses imprecise vocabulary	
Trouble remembering what was read	
Difficulty retelling a story	
Problems defining vocabulary	
Trouble recalling relevant detail from a passage	
Difficulty retelling a sequence of consecutive actions	
Problems drawing an accurate picture from an age appropriate orally presented story	
Problems with cloze or maze reading tasks	
Difficulty providing possible outcomes in a given unfinished story	
Problems identifying inconsistencies in a contrived story	
Problems sorting and sequencing randomized sentences from the same story (story anagram)	
Difficulty with inference tasks (providing missing elements, elaboration on detail, etc.)	
Family history of learning disability	

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty finding the right word to say or slow, labored, or limited amount of speech		Language
Frequently asks for directions to be repeated or gets lost in the middle of a problem		Working Memory
Does well on daily assignments but doesn't do well on formative assessment/end of week tests. Difficulty recalling facts and related concepts/ideas. Difficulty with memorization. Difficulty with word retrieval.		Long Term Memory
Difficulty with conceptual thinking, understanding how ideas are interrelated and forming conclusions		Fluid Reasoning
Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time. Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion.		Attention and Executive Functions

Written Expression (WE)

Development of Working Hypothesis

Guiding Statement:

Written language disabilities co-occur with reading disabilities about 75% of the time (Katusic et. al, 2009) but they may exist separately. Current research tends to group written language disorders into three brain-based categories. The first two categories are dysgraphia (poor handwriting related to impaired orthographic memory and processing) and dyslexia (see Basic Reading Skills) (Mather & Wendling, 2011). Dysgraphia and dyslexia can be caused by deficits in phonological, orthographic, or morphological memory. Both conditions affect basic writing skills (i.e., spelling and editing). They may also affect writing speed. The third category of written language disorders is Oral and Written Language Disorder (OWL-LD) (Berninger, 2011). Students with OWL LD are sometimes made eligible for special education services under the category of Communication Disordered (CD) because their disability may affect the primary areas of language: semantics, syntax, and morphology. OWL LD students may also have difficulty with basic writing skills. Teams should be aware that other disabilities in executive functions (e.g., ADHD, ASD) might also impair students' written expression achievement. Current federal guidelines require teams to examine only written expression as an eligibility category. However, teams are encouraged to be mindful of the components of brain-based written language categories because of their relevance to academic intervention. The basic psychological processes of written expression are language, working memory, fluid reasoning, processing speed, sensory motor, attention, and executive functions. Students with primarily dysgraphia/dyslexia indicators would benefit from explicit handwriting and spelling instruction. Phonics based instruction should be used to address phonetically inaccurate spelling errors and morphological strategies should be used to address spelling errors that are phonetically accurate. Students with an OWL SLD subtype would benefit from language based instructional strategies including semantic, morphological and syntactic awareness instruction.

Purpose:

Formulate hypothesis about the nature of the difficulty.

Written Expression (WE): Check box to the right if description applies.

Academic Indicator Descriptions; Dysgraphia, Dyslexia	
Poor visual format (spacing, paragraphs, indentation, margins, etc.)	
Poor spelling (phonological, additional syllables, etc.) spells words how they sound rather than as they should look (srkoll for circle).	
Limited use of punctuation, incorrect punctuation	
Incorrect or missing capitalizations	
Poor decoding/reading skills	
Poor letter formation	
Consistently confuses similarly shaped letters (b/d, p/g, p/q, n/u, m/w) or order of letters (from vs. form)	
Academic Indicator Descriptions; OWL LD	
Poor narrative (consistent style, point of view, etc.)	
Demonstrates poor grammatical structure (verb tense, subject verb agreement, etc.)	
Uses poor semantics (words with wrong meaning)	
Does not correct mistakes (revising for content, mechanics, etc.)	
Problems with vocabulary (age appropriate words, descriptive, imaginative)	
Poor descriptive quality	
Poor organization	
General	
Family history of learning disability	

- ☐ Primarily handwriting and spelling (dysgraphia, dyslexia)
- ☐ Primarily written expression (OWL LD)
- ☐ Combination of both types

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty finding the right word to say or slow, labored, or limited amount of speech. Difficulty comprehending language and learning vocabulary.		Language
Frequently asks for directions to be repeated or gets lost in the middle of a problem or assignment. Tendency to lose track when working on sequential activities. Difficulty with multi-tasking.		Working Memory
Difficulty with conceptual thinking, understanding how ideas are interrelated and forming conclusions		Fluid Reasoning
Takes longer to complete tasks than others the same age		Processing Speed
Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion. Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time		Attention and Executive Functions

Math Calculation (MC) Development of Working Hypothesis

Guiding Statement:

Math calculation skills have generally been conceptualized and evaluated as paper-and-pencil math computations. However, brain-based math calculation skill development is somewhat more complex. Researchers have examined developmental elements such as number sense (immediately apprehending exact quantities of small collections of objects and the approximate magnitudes of larger collections, estimation, and making small adjustments in numbers of items relatively automatically) and counting knowledge and strategies (1:1 correspondence, stable order, cardinality, abstraction, etc.). There are three subtypes of brain-based math disabilities: procedural, semantic, and visuospatial (Geary et al. 2011). Math calculation activities may be affected by any of these. These distinctions become important in both assessment and intervention for math calculation and math reasoning problems. Their characteristics are listed below. The type of math instruction in schools may also play a role in diagnosis and intervention. Nearly a decade of math instruction has emphasized conceptual problem solving which may have resulted in a reduced emphasis on instruction in basic number skills (Geary, 2004). Cognitive correlates of calculation skills have been centered on executive functions (particularly inhibiting irrelevant items), attention, memory and learning (working memory, long-term storage and retrieval, and rapid naming), meta-cognition (sequential reasoning), problem solving (particularly quantitative reasoning), and speed of cognitive processing.

Purpose:

Formulate hypothesis about the nature of the difficulty.

Math Calculation (MC): Check box to the right if description applies.

Academic Indicator Descriptions : Semantic	
When facts are retrieved, there is a high error rate	
Problems with rapid number identification	
Early delays in counting objects or object sets	
Errors are often “neighbors” of the numbers in the problem (e.g., $2 + 5 = 6$)	
Require excessive repetition of math facts for learning	
Difficulty retrieving math facts such as answers to simple math problems	
Gets the same problem wrong after solving it correctly earlier	
Delayed response times on simple counting or computations	
Academic Indicator Descriptions : Procedural	
Errors in regrouping process including column alignment, 0's, decrementing	
Uses inefficient or ineffective strategies when solving simple problems	
Lack of understanding of concepts underlying use of certain procedures	
Uses less mature procedures for computations (finger counting, counting all)	
Problems with sequence or order in computations	
Academic Indicator Descriptions : Visual	
Difficulty understanding geometric concepts and relationships	
Difficulty making charts or visuals from equations	
Difficulty with graphs, charts, and other visual math	
General	
Family history of learning disability	

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty with mental math. Frequently asks for directions to be repeated or gets lost in the middle of a problem or assignment. Tendency to lose track when working on sequential activities. Difficulty with multi-tasking.		Working Memory
Does well on daily assignments but doesn't do well on formative assessment/end of week tests. Difficulty recalling facts and related concepts/ideas. Difficulty with memorization. Difficulty with word retrieval.		Long Term Storage and Retrieval
Difficulty with conceptual understanding		Fluid Reasoning
Takes longer to complete tasks than others the same age		Processing Speed
Difficulty naming learned numbers, letters, or names quickly, or substitutes the wrong name or word, has words on “the tip of the tongue” but can't remember, takes long pauses in speaking, uses the wrong word or “speaks around” a word or someone's name, has difficulty recalling known words from a particular category		Speed of Lexical Access
Difficulty with numeral and math symbols		Orthographic Processing
Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time. Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion		Executive Functions and Attention

Math Problems Solving (MPS)
Development of Working Hypothesis

Guiding Statement:

Geary and his colleagues (2011) have identified three types of brain-based math disabilities: 1) procedural 2) semantic, and 3) visuospatial. All three types of disabilities may affect math reasoning skills because math story problems are varied enough to tax each brain system. However, the majority of students with semantic math disabilities will have math reasoning difficulties and also have reading problems. Language skills and their correlates are required as a first step to conceptualize math story problems and then as a second step in accurately and fluently retrieving math language and facts from long-term memory. Cognitive correlates of reasoning skills include executive functions (particularly inhibiting irrelevant items), attention, visual spatial, language use, memory and learning (working memory, long-term storage and retrieval), meta-cognition (sequential reasoning), problem solving (particularly quantitative reasoning), and speed of cognitive processing.

Purpose:

Formulate hypothesis about the nature of the difficulty and develop an intervention and progress monitoring plan across all tiers of support and assist in determining if a learning disability is suspected.

Math Problem Solving (Math Problem Solving): Check box to the right if description applies.

Academic Indicator Descriptions: Semantic	
When facts are retrieved, there is a high error rate	
Problems with rapid number identification	
Early delays in counting objects or object sets	
Errors are often “neighbors” of the numbers in the problem (e.g., $2 + 5 = 6$)	
Require excessive repetition of math facts for learning	
Difficulty retrieving math facts such as answers to simple math problems	
Gets the same problem wrong after solving it correctly earlier	
Delayed response times on simple counting or computations	
Academic Indicator Descriptions: Procedural	
Errors in regrouping process including column alignment, 0's, decrementing	
Uses inefficient or ineffective strategies when solving simple problems	
Lack of understanding of concepts underlying use of certain procedures	
Uses less mature procedures for computations (finger counting, counting all)	
Problems with sequence or order in computations	
Delayed response times on simple counting or computations	
Academic Indicator Descriptions: Visual	
Difficulty with graphs, charts, and other visual math	
Difficulty making charts or visuals from equations	
Difficulty understanding geometric concepts and relationships	
General	
Family history of learning disability	

Functional manifestations and possible related areas of cognitive processing:	Check if Description Applies:	Psychological Processing Area
Difficulty with graphs, charts, and other visual representations		Visual Spatial
Difficulty with math vocabulary		Language
Frequently asks for directions to be repeated or gets lost in the middle of a problem or assignment. Tendency to lose track when working on sequential activities. Difficulty with multi-tasking.		Working Memory
Difficulty with conceptual understanding		Fluid Reasoning
Mind appears to go blank, gets overwhelmed with difficult tasks, or can't pay attention for long, unusual or erratic patterns of error, easily distracted from relatively mundane tasks, inattentiveness to errors, problems when focusing on more than one thing at a time. Difficulty figuring out what is needed for a task, getting started, or sticking to a plan of action, does not anticipate the time or sequence necessary for task completion.		Attention and Executive Functions