Crafting Minds

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Common Profiles/Subtypes of Dyslexia

Background: Dyslexia is characterized in part by the striking inability to read *accurately* and/or *fluently*, despite adequate exposure and instruction. Yet, beyond the broad definition of dyslexia, significant evidence now demonstrates that rather than a homogenous impairment, dyslexia is a **heterogeneous disorder with specific profiles or (subtypes) of strength and deficit patterns** (Wolf & Bowers, 1999; Wolf et al., 2002; Miller et al., 2006).

Assessment Battery: Developing a thorough assessment battery to evaluate students' cognitive strengths and weaknesses is the first step in identifying subtypes. A thorough battery will **include measures from across several different domains related to written language comprehension**. These domains include: *Oral Language Processing, Phonological Processing & Nonword Decoding, Single Word and Connected Text Skills, Retrieval and Reading Efficiency,* and *Related Cognitive Abiliti*es. Within each domain there are suggested measures, and in some cases specific subtests, which assess critical skills areas (see Figure 1).

Figure 1: Assessment Battery for Identifying Reading Subtypes.
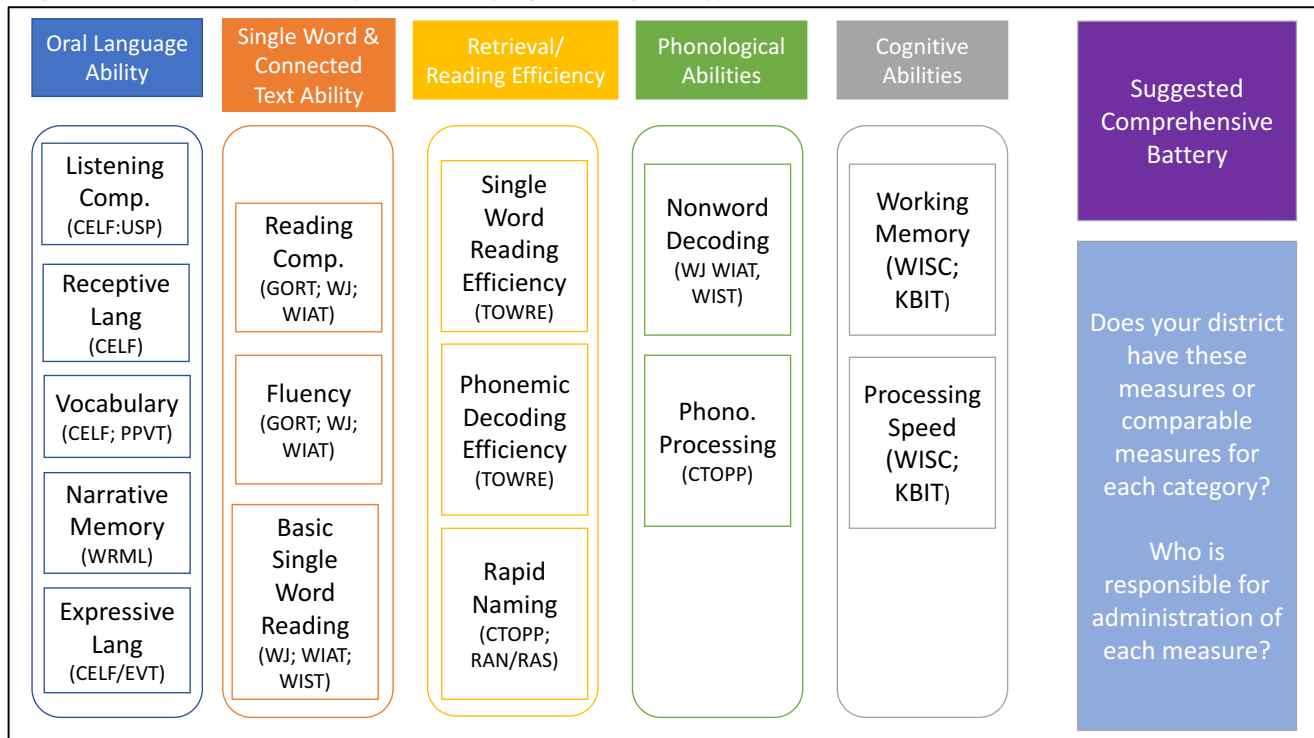
<u>**Common Profiles/Subtypes**</u>: Beginning in kindergarten, subtypes can be characterized by cognitive strengths and weaknesses that predict reading achievement (Ozernov-Palchik et al., 2016) and inform the nature of specialized reading instruction and curricular modifications. There are five common subtypes. The recommendations below for identifying each subtype are a suggested framework and should not replace the diagnostic judgement of skilled practitioner.

Subtype 1: Phonological Deficit. The first subtype, Phonological Deficit, is characterized by a deficit in phonological processing and/or decoding. A Phonological Deficit is the most widely acknowledged and detected subtype (Lovett, Steinbach & Frijters, 2000), and it represents: a) difficulty distinguishing between and manipulating the sounds in language; and b) matching up sounds with corresponding symbols for accurate reading and spelling. A Phonological Deficit is indicated by *below average* performances on measures of phonological and phonemic awareness, and/or non-word phonemic decoding. *These deficits impact students' accuracy during reading and subsequent comprehension*. Students with a phonological deficit will perform in at least the *average range* on measures of *naming speed, oral language ability*, and *areas of cognitive processing* (*See Figure 2: Pattern of Weaknesses Among Students with Phonological Deficit Only*).

Recommended instruction: *Direct, explicit, systematic, strategy-based multi-sensory instruction in phonological processing and phonemic awareness* (particularly before age 9) which includes but is not limited to: *Lindamood Bell's LiPS program*, *Just Right Phonological Awareness*, *Earobics, Read Naturally's Funemics*. Examples of direct, explicit, systematic, strategy-based multi-sensory phonics program include, but are not limited to: *Orton Gillingham, Wilson Language Program, Project Read, Lively Letters, Spell Links, and Barton Reading*.

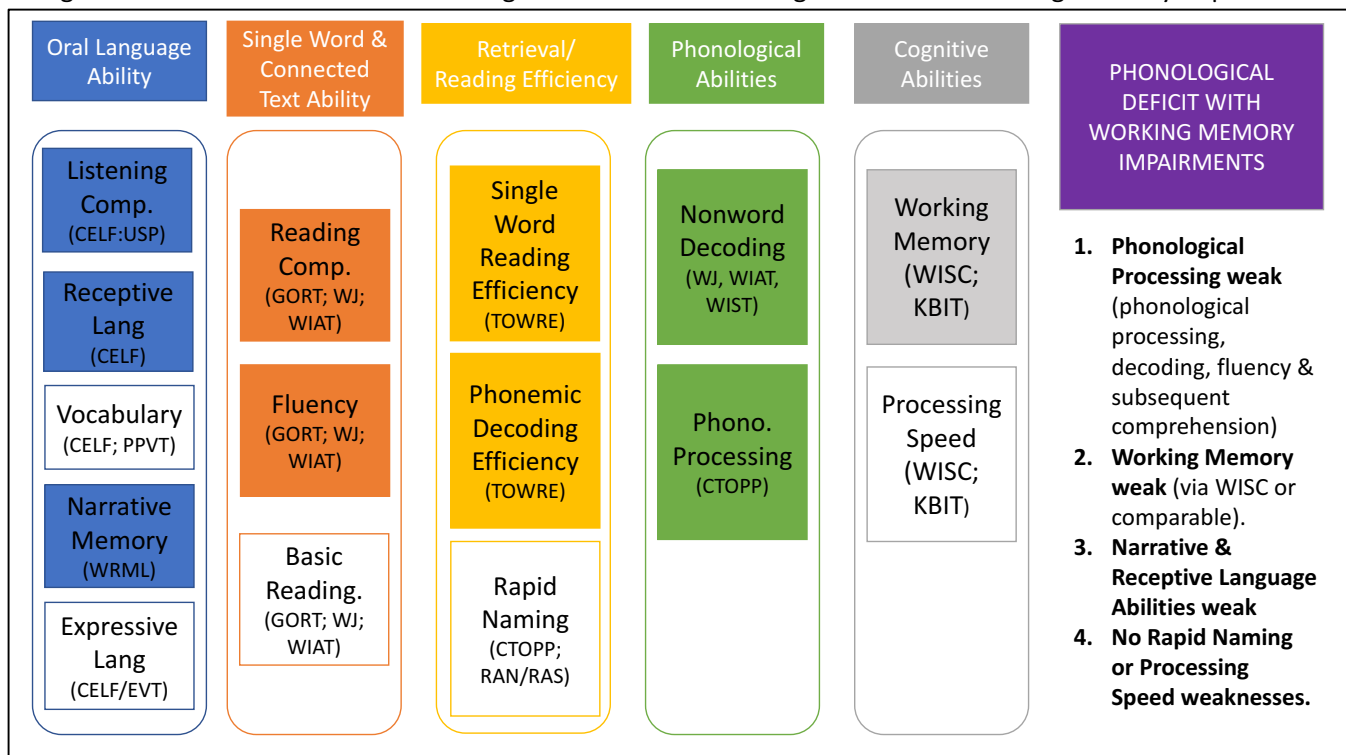Figure 2: Pattern of Weaknesses Among Student with Phonological Deficit Only
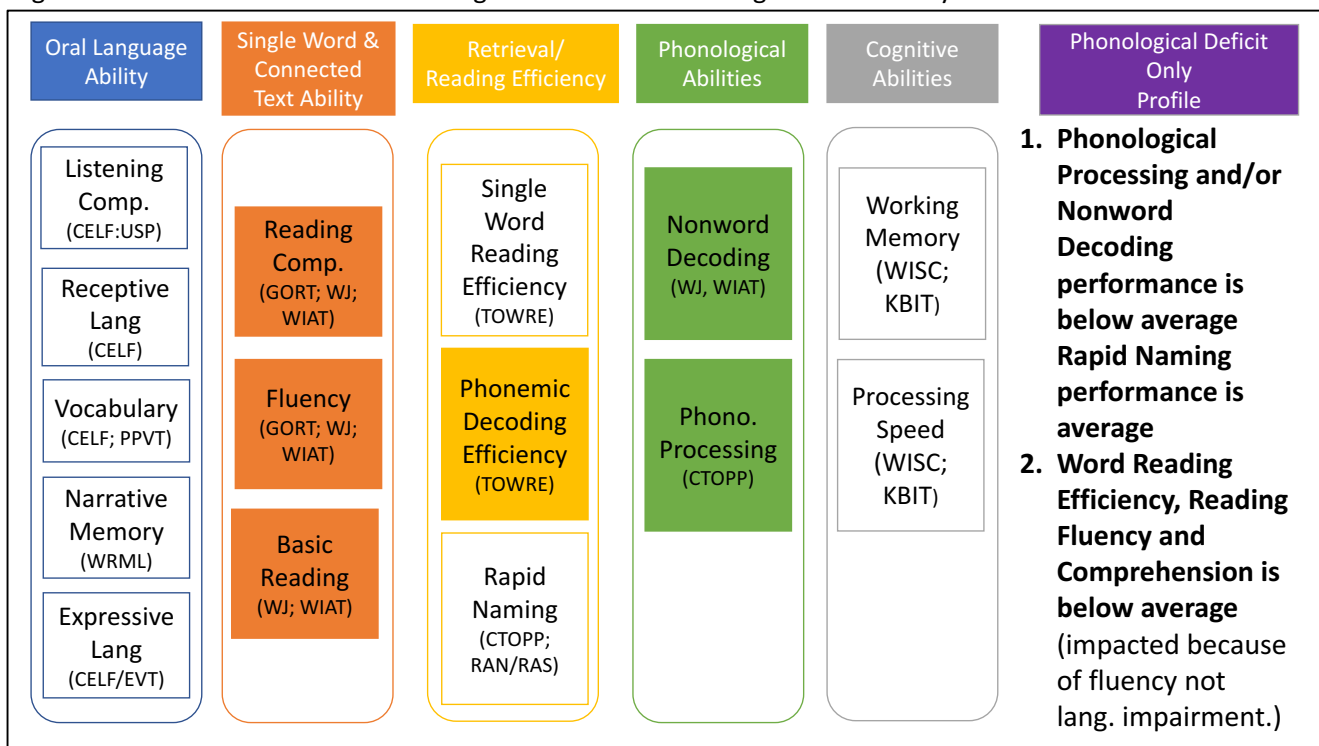
Shaded boxes represent areas of Below Average performance, and/or relative weakness that impacts achievement.

Subtype 2: Phonological Deficit with Working Memory Weaknesses. The second deficit introduces a common comorbidity in which students struggle in *both* phonological (i.e. phonemic awareness and decoding) and working memory processes. A Phonological Deficit with Working Memory Weaknesses is characterized by *below average performance on measures of phonological and phonemic awareness, and/or non-word phonemic decoding*. These deficits impact students' accuracy during reading and subsequent comprehension. Students <u>also</u> perform in the *below average range on measures of working memory on measures of intellectual capacity and/or narrative comprehension when stories are read aloud* (*See Figure 3: Pattern of Weaknesses Among Students with Phonological Deficit & Working Memory Impairments).* The co-morbidity of weaknesses in both areas can make learning to read particularly difficult because rules that govern the alphabetic code (i.e. explicit phonics instruction) can often be abstract or decontextualized. For example, when learning the strategies to decode long words by syllable types, students will learn how to distinguish between syllable types. One common syllable type is a *closed syllable*, but the rule, that syllables are closed when the vowel sound is short, and closed in by a consonant, can be difficult for students with working memory issues to master because it relies on a pure memorization strategy that often unrelated to other aspects of word knowledge.

Recommended instruction: Pair instruction designed for a phonological deficit (see Subtype 1) with instructional characteristics that support weaknesses in working memory. These instructional characteristics include *highly structured routines, a strong visual component, kinesthetic techniques, use of mnemonics, activation of background knowledge, regular opportunities for review*. Examples of programs that include, but are not limited to *Lively Letters, and Project Read* for phonics, *Sight Words You Can See*, and *Seeing Stars* for sight words.

Figure 3: Pattern of Weaknesses Among Students with Phonological Deficit & Working Memory Impairments
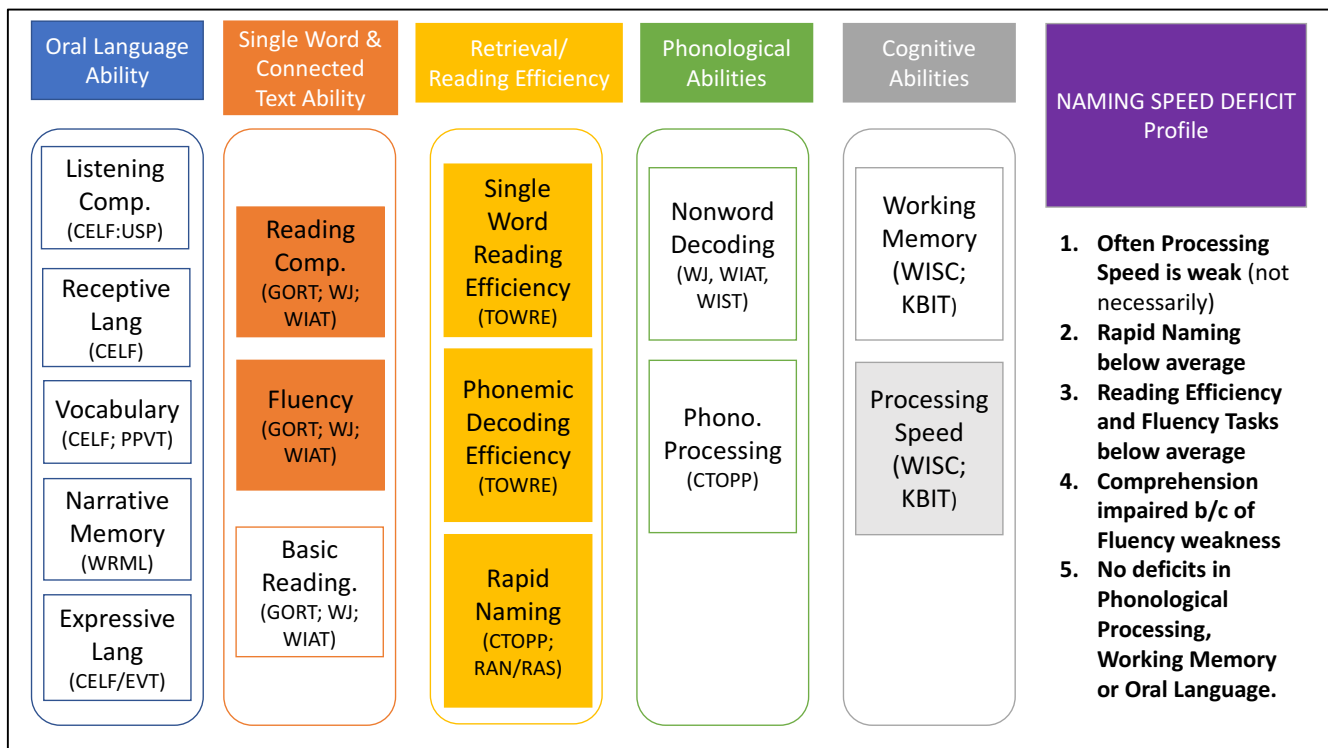

* *Shaded boxes represent areas of Below Average performance, and/or relative weakness that impacts achievement.*

Subtype 3: Naming Speed Deficit: The third subtype, a Naming Speed Deficit, is related to the *speed and accuracy of students' automatic access to and retrieval of labels when they are presented with visual symbols*, for example rapidly naming a letter, number, color, or object (Bowers & Swanson, 1991; Wolf, Bowers & Biddle, 2000). This deficit is conceptualized not simply as a problem in retrieval, but as a *deficiency in the processing speed necessary to connect visual and linguistic knowledge.* As such, it is conceptualized as an emerging mini-circuit of the same processes that must be connected in the later developed reading brain. A naming speed deficit is indicated by *below average* performances on measures of *naming speed,* and/or efficient *phonemic decoding* or *single word reading. These deficits impact students' fluency during passage reading and typically also impact reading comprehension.* There is often a comorbid weakness in the *related area of cognitive processing called processing speed*. Students with a naming speed deficit *will perform in at least the average range on measures of phonological processing and oral language ability*.

Recommended instruction: *Direct, explicit, multi-sensory, strategy-based instruction* in *all aspects of word knowledge (phonology, orthography, semantics, syntax & morphology)* in order to support retrieval. Examples of programs include but are not limited to: *RAVE-O* (1st – 4th grade), and *Language! or Language! Live* (5th – 12th grade). If students struggle with fluency, but have average scores on measures of rapid automatized naming (RAN) they will likely benefit from a repeated reading program such as *Read Naturally, Wilson Language's Just Words or Great Leaps*.

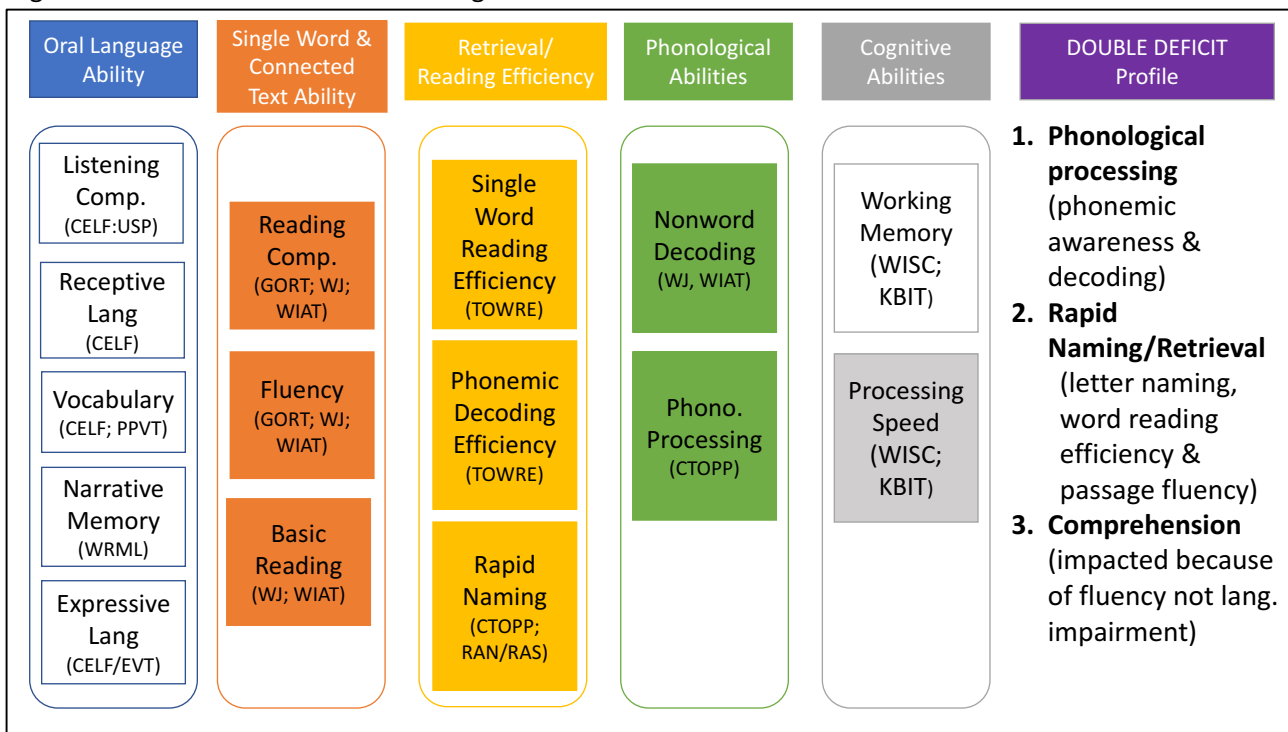Figure 4: Pattern of Weaknesses Among Student with Naming Speed Deficit

* Shaded boxes represent areas of Below Average performance, and/or relative weakness that impacts achievement.

Subtype 4: Double Deficit. The fourth deficit, a Double Deficit, is considered the most severe form of dyslexia in which students struggle with weaknesses in two major contributors to reading ability: phonological processing and naming speed. The nature of the profile implies that students will have difficulty becoming accurate and fluent in their reading, and because of their weaknesses (and effort expended on reading) they are likely to struggle with fatigue, and comprehending complex texts. A Double Deficit is indicated by *below average* performance on measures of *single word and connected text ability, retrieval, and phonological abilities.* There is often a *comorbid weakness in processing speed,* and sometimes even *working memory*. Students are typically *performing in at least the average range on measures of oral language ability.*

Recommended Instruction: Due to its severity, students require *highly intensive, daily instruction for at least 45-minutes per session* in the curricula recommended for phonological and naming speed deficits (*See recommendations above*). If practitioners are delivering curricula which are designed for a full 45-minute session, then they should not divide the curriculum into shorter blocks. Rather, research suggests that intensive work in a particular curriculum (e.g. phonics) for an intensive period of time (several weeks) and then switching the alternate curriculum (e.g. fluency) at a natural breaking point (e.g. end of a unit).

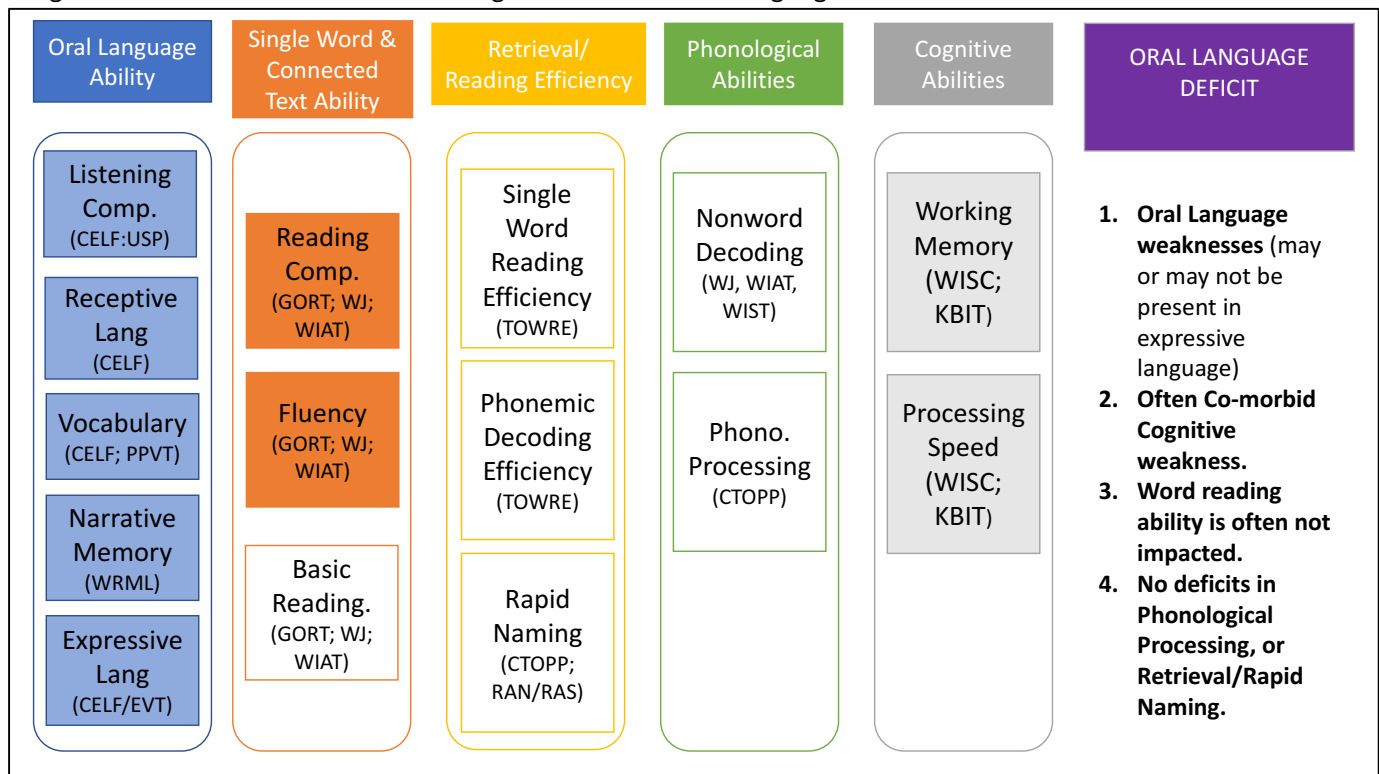Figure 5: Pattern of Weaknesses Among Students with a Double Deficit

* Shaded boxes represent areas of Below Average performance, and/or relative weakness that impacts achievement.

Subtype 5: Oral Language Deficit: The final deficit is related to students' ability to process oral and therefore written language. An Oral Language Deficit, also referred to as a Communication Disorder or Specific Language Impairment (SLI) implies that weaknesses lie in organizing language (e.g. structure of a narrative, vocabulary, inferential thinking, cause and effect, etc.) but not in decoding or sight word recognition. An Oral Language Deficit is indicated by *below average* performance on measures of *oral language ability, reading fluency and comprehension.* There are often *comorbid weaknesses in cognitive abilities such as verbal comprehension, fluid reasoning, working memory and processing speed*. Average range performance is usually observed *on measures of phonological and single word reading abilities, and naming speed* (*See Figure 6: Pattern of Weaknesses Among Student with Oral Language Deficits).*

Recommended Instruction: Since the primary deficit lies in the organization of language, systematic language-based instruction is focused on providing students with explicit, visual frameworks of how language is organized in various texts (e.g. understanding narratives, categories ideas, distinguishing between main idea/details, compare and contrast, etc.). Language-based instruction is designed to remediate weaknesses in oral language comprehension by *minimizing abstract language*, *pairing all oral instructions with visuals* to demonstrate the relationship between ideas, *utilizing multi-sensory components to tangibly depict conceptual ideas*, and relying heavily on routines. Examples of these curricula include but are not limited to: *Story Grammar Marker, Story Form, and Report Form, and Visualizing/Verbalizing for reading comprehension. Framing Your Thoughts, Step Up to Writing, and EmPOWER for writing.*

Figure 6: Pattern of Weaknesses Among Student with Oral Language Deficits

Oral Language Ability	Single Word & Connected Text Ability	Retrieval/ Reading Efficiency	Phonological Abilities	Cognitive Abilities	ORAL LANGUAGE DEFICIT
Listening Comp. (CELF:USP)	Reading Comp. (GORT; WJ; WIAT)	Single Word Reading Efficiency (TOWRE)	Nonword Decoding (WJ, WIAT, WIST)	Working Memory (WISC; KBIT)	1. **Oral Language weaknesses** (may or may not be present in expressive language)
Receptive Lang (CELF)	Fluency (GORT; WJ; WIAT)	Phonemic Decoding Efficiency (TOWRE)	Phono. Processing (CTOPP)	Processing Speed (WISC; KBIT)	2. **Often Co-morbid Cognitive weakness.**
Vocabulary (CELF; PPVT)	Basic Reading. (GORT; WJ; WIAT)	Rapid Naming (CTOPP; RAN/RAS)			3. **Word reading ability is often not impacted.**
Narrative Memory (WRML)					4. **No deficits in Phonological Processing, or Retrieval/Rapid Naming.**
Expressive Lang (CELF/EVT)					

* Shaded boxes represent areas of Below Average performance, and/or relative weakness that impacts achievement.

<u>Progressing Monitoring & Benchmark Assessments:</u> Assessments serve as a critical practitioner tool in determined the degree to which instruction is supporting adequate skill building. In addition to the standardized measures that are used during a diagnostic evaluation, there are three different types of assessments that are essential to an RTI model: curricular assessments, benchmark assessments and progress monitoring measures. **Curricular assessments** are built into the curriculum to determine the extent to which the student is mastering the concepts from the lessons. Curricular assessments are typically administered on a weekly basis and help inform the pacing and focus of the instruction. **Benchmark assessments (not to be confused with the specific measure called the *Benchmark Assessment System* from Heinemann)** are designed to measure student's progress towards expected annual reading achievement. Benchmark assessments are typically administered to the general population of students three times per year and identify students who need additional support (Tier 2 or Tier 3) and help to inform the goals of instruction. **Progress monitoring measures** are designed to measure student growth in a short period of time in order to determine how instruction is support the development of skills. Progress monitoring measures are typically aligned with benchmark assessments, and are not necessarily tied to a particular curriculum.

The Center on Response to Intervention has wonderful resources available for administrators and they can be accessed at www.rti4success.org.