Assessing and Differentiating Reading Disorders
Part 1

Agenda

- Making connections between oral and written language
- Defining reading and addressing core components
- Addressing role of the SLP in reading disabilities
- Differentiating Language-learning disability (LLD) from dyslexia (DD)
- Examining models of reading

Connections between Spoken Language and Literacy

- Language Processes are the keys to reading disability
- Reading disabilities can manifest differently depending on the fundamental weakness that impact reading skill
- To differentiate fundamental weaknesses you must examine spoken and written language skills.

Connections between spoken and written language disabilities

- Children with speech and/or language impairments are at risk for later reading impairment
- Children diagnosed with dyslexia often have a history of delay in oral language acquisition as well as phonological deficits
- Children with oral language deficits and phonological processing deficits are at greatest risk

20-30% of all school age children find learning to read a difficult task (Lyon, 1995)

- 5-7% - specific language impairment (40-80% reading difficulties)
- 5-7% - dyslexia (specific reading difficulties)
- Majority lack adequate early preparation and instruction

All children who struggle with reading have deficits in one or more domains of language

- phonemic awareness (phonological)
- word recognition (phonological/orthographic)
- word meanings in isolation (semantic)
- word meanings in context (semantic/syntactic)
Connections between spoken and written language disabilities

- Most children with reading deficits have weaknesses in language at the semantic and/or phonological levels regardless of underlying cause (environmental, biological).
- Children with oral language impairments are four to five times more likely than their peers to have reading difficulties during the school years (Catts el al., 1999).
- Dyslexia, a specific reading disability most probably caused by phonological (language) processing deficits, occurs in 10-15% of the school age population.
- NOT all reading disabilities are due to dyslexia.

Connections between spoken and written language disabilities

- Children who have RD due to environmental and instructional factors will typically show weaknesses in spoken language, especially in vocabulary.
- Primary cause of depressed reading results from lack of adequate experiential and instructional opportunities BUT a subset of children have impaired reading due to weaknesses in neurobiological processes that (i.e., phonological processes) that impede the development of reading acquisition.

Hierarchy of Connections

- Cross modal mapping: grapheme-phoneme correspondences
- Phonemic awareness
- Spoken language
  - Segmenting language at word level
- Reading and writing
  - Segmenting language at the phonemic and graphemic levels

Definition of Reading

- “...a process by which one constructs meaning from printed symbols.”

ASHA’s Ad Hoc Committee on Reading and Written Language Disorders (2001)
Deficit vs. Disability

- Difficulty indicated by class performance or test scores
- Difficulty consistent with overall academic performance
- Adequate rate of learning given good instruction
- Show parallel gains in word reading and comprehension
- Does not show a marked difference between spoken language abilities and reading abilities likely due to lack of environmental supports (school, home)

Learning Disability

- The LD classification represents a heterogeneous group of learners
- Difficulties in one or more academic domains are generally defined as unexpected weaknesses that are inconsistent with the learner’s overall intellectual abilities and socio-cultural experiences (often defined using discrepancy formula)
- Concept of learning disability has been causally linked to a dysfunction in the way the brain processes information since 1800s

Defining Reading Disability

- Reading disability -- most common learning disability
- Reading disabilities occur for the vast majority of children who are diagnosed with LD (Lerner, 1989; Lyon, 1995)
- 80% of children with learning disabilities struggle with reading
- Even within the group of children identified with primary reading disabilities, there is strong evidence for different profiles of strength and weakness

Reading Disabilities

- Types of learning disability
- Most prevalent learning disabilities
- Causal roots in one or more domains of language -- not caused by lack of environmental opportunities or primary cognitive, social or emotional deficits.
- The social consequences of having unidentified and untreated reading disabilities can be enormous for individuals, families, and society

- Vocabulary
- Phonemic awareness
- Decoding
- Comprehension
- Fluency
- Writing
- Spelling
Types of Reading Deficits

- **Type 1**: Depressed reading due to lack of adequate environmental exposure and/or instruction
  - Inadequate exposure to print
  - Inadequate language learning
- **Type 2**: Depressed reading due to deficits in language processing at one or more levels
  - Oral language deficits as preschoolers (language learning disability)
  - Normal language until emergent literacy demands (dyslexia specific reading disability)
- **Type 3**: Combination of language learning disability and lack of adequate environmental exposure and/or instruction

**Specific Reading Disability (Dyslexia)**

- Children who have RD due to the neurobiological condition called dyslexia will have listening comprehension abilities that far exceed their reading abilities.
- Phonological deficits NOT semantic and syntactic deficits are not the primary cause of reading difficulties in children with dyslexia.

**Components of Reading**

- Decoding
- Comprehension

**Simple View of Reading**  
(Gough & Tunmer, 1986)

\[ \text{Decoding} \times \text{Comprehension} = \text{Reading} \]

**Using the Structure of DNA as a Heuristic for Thinking about Components of Reading**

- Molecular structure of DNA (blueprint for genetic information)
- Two complimentary strands wrapped around each other

**Decoding and Comprehension**

- Each strand is called a helix—double helix
- Rungs (bands) connect the strands
- Strength of bands determines the strength of bond between strands
- Subskills such as phonemic awareness, vocabulary etc.

**How to Predict RD?**

- First step in preventing reading disabilities is the early identification of children who are at risk for RD
  - Family history
  - Developmental history
  - Environmental disadvantage
- To accomplish this we need to determine what measures serve as the strongest predictors
**Predictor Variables**
(Snow et al., 1998)

- Predictors - correlates or associated conditions
- Predictors - usually determined by the strength of a relationship between a variable (e.g., letter knowledge) and some future behavior (e.g., reading disability)

**RD Predictors**

- Good predictions can be made from combined measures at the kindergarten level
- Best predictions can be made from early reading skills and phonemic manipulation skills (i.e., deletion of sounds)

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**Role of the SLP in Reading Disabilities**

**ASHA recommendations:**  
Role of the SLP in Reading Disabilities

- Serve as KEY professionals in identifying children at risk for RD
- Assess spoken language in all children who have reading deficits
- Develop a specialization in assessing  
  - Children with language learning disabilities (LLD)
  - Children with dyslexia (SRD)

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**Leadership Issues**

**PROBLEM:**
- Until recently -- SLPs have not been systematically educated to prevent, assess, or treat reading disabilities

**CONSEQUENCE:**
- SLP is poorly represented in the education and service delivery for children with RD

**RECOMMENDATIONS:**  
SLPs SHOULD
- Serve as KEY professionals in identifying children at risk for RD
  - Assess spoken language in all children who have reading deficits
  - Develop a specialization in treating  
    - children with language learning disabilities
    - children with specific reading disability - dyslexia

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**Argument: Critical Role of the SLP**

- The unique skills of SLPS and reading specialists and the shared knowledge between other professional can serve to create an optimal learning context for children who have dyslexia or other types of reading disabilities
Interdisciplinary Relationships

Learning Disabilities Specialists
- Speech-Language Pathologists
- Special Educators
- Early Childhood Educators
- Reading Educators

Range of roles for SLPs
- Screen pre-kindergartners & kindergartners for pre-reading weaknesses
- Collaborate with classroom teacher for prevention curriculum within the classroom
- Provide direct services for assessment & treatment of reading deficits
- Prescribe classroom & test taking accommodations
- Collaborate with learning disabilities specialist in service delivery for treatment
- Direct service delivery for diagnostics & treatment in clinical and private practices

Front and center with other learning disabilities specialists

Summary of Roles for SLP
- Knowledge of multidimensional skills needed for skilled reading
- Knowledge for assessment and differential diagnosis
- Knowledge of optimal instruction and accommodations

SLP Role in Predicting & Preventing
- Collaborative partnership with teachers, administrators
- Direct role in preventative instruction
- Letter knowledge
- Letter-sound knowledge
- Concepts of print
- Sense of story grammar
- Relationship between reading & spelling

Prevention – Most Critical Role
- Identify preschool screening of children who are at risk for reading delays or disabilities. Risk factors include:
  - Low SES
  - Family history of language and/or reading delays
  - Developmental speech or language delays
  - Employ screening instruments to assess pre-reading phonological awareness and print concepts from ages 3-5
  - Provide intervention in all areas of weakness (don’t wait and see!)
  - Continue intervention until child is functioning at expected levels for age and grade
  - Re-evaluate child’s performance annually until it is clear that s/he is working at age/grade expected levels

Phonological awareness & Knowledge of letter names

BEST predictors of reading disability

- SYLLABLE
- ONSET-RIME
- PHONEMIC AWARENESS

FEB
SLP Role in Assessment

- Identification children at-risk
- Identification written language deficits in older children
- Comprehensive assessment
  - phonemic awareness
  - word reading and decoding
  - reading fluency
  - reading comprehension
  - spelling
  - text writing

Differential Diagnosis
- deficit or disability
- nature of disability

SLP Role in Treatment

- Intervention (oral and written levels)
  - phonemic awareness
  - phonics
  - fluency
  - comprehension
  - spelling
  - narrative writing

SLP’s Role in Intervention

- Response to Intervention Model (RTI) and role of the SLP
  - Identifying strengths and weaknesses
  - Selecting appropriate cope and sequence of specialized instruction
  - Overseeing and conducting interventions (when needed)

Core Knowledge: Processes Involved in Early Stages of Reading Acquisition

Amaligram Theory of Reading & Spelling (Ehri, 1992)

- Visual-semantic route
- Visual-phonological route
How the Amalgamation Process Works

- Associations are formed between visual forms (sequences of letters) seen in words and their pronunciations stored in memory (sounds).
- Once these routes are set up, the reader can look at a word and immediately retrieve the pronunciation without sounding out every letter.
- Experience through repetition in making letter-sound associations leads to the formation of systematic connections between words and their pronunciations – allowing for rapid automatic reading.

Connectionist Models

- Skillful reading is dependent on three types of information.

  **PARALLEL PROCESSING**
  - Recognizing print
  - Knowing its pronunciation
  - Knowing its meaning

- These three types of information are not processed independently of one another.

Model/Framework

Seidenberg & McClelland (1989)

Skilled reading is the product of coordinated and highly interactive processing of all three (see diagram).
Aims of Assessing and Differentiating Reading & Writing Disorders: Multidimensional Model

- Clinical Scheme for assessment and differential diagnosis of reading problems based on:
  - Synthesizing the literature
  - Presenting developmental schemes for core components
  - Identifying core weaknesses that underlie the struggling readers’ difficulties
  - Showing diagnostic profiles that have scientific support
  - Recommending specific treatments for case studies
  - Providing guidelines for counseling parents

Multidimensional Model for Assessing Reading and Writing (MARwR)