STUMBLING BLOCKS TO LEARNING: Identifying the “warning signs”

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Goals

Today’s workshop is intended to give you the answers to the following questions:

• What are the behaviors that you might observe that would place a child at risk for learning?
• Do all children who struggle with language struggle with learning to read?
• What are some of the early warning signs that a child, at risk for reading failure, may exhibit?
• How will language deficits impact learning?
• Will appropriate early intervention “fix” the problem?
Questions to consider:

• Is there a difference between a *Learning Disability* and a *Learning Difference*?
• Are learning disabilities *static*?
• How early can you identify a learning disability?
• Are learning disabilities always present (from birth) or can they “develop” later, in adolescence?
Neuroscience is providing greater insight into how the typical brain learns. This is the “standard” from which we should judge what is atypical.
Language, Speech and Writing

- **LANGUAGE** can be traced back 1 million years.
- **SPEECH** is thought to have become the dominate mode of communication 50,000 years ago.
- **READING** and writing are only 5000 years old and NOT part of our neural circuitry.
- **WRITING**, like reading is an overlaid function.
WIRED TO TALK

- Born with the innate capacity to acquire language
- Neurological differences between males and females by as early as 28 weeks gestational age
- Language universals are independent of culture
- Critically sensitive periods for different aspects of language
- Language plasticity and neurological growth
As we get more sophisticated in our ability to study the brain we are refining past generalizations

1. “Critical period”. now know that different aspects of language have different critical periods

2. “gender difference” Statistically boys develop language slower then girls different skills develop at different rates
Neuroplasticity and Critically Sensitive Periods in neurodevelopment

- Some systems are determined very early:
  - **Phonology**: tight early critical period for some aspects of language like accent
- Some systems are highly modifiable and dependent on early experience:
  - **Grammar**: By 3 years plasticity is already diminished, and fixed by 4 - 6 yrs.
- Some systems retain the ability to change for life:
  - **Semantic** (vocabulary or word knowledge):
Language Universals

• 2 -3 months of age: differentiate cry (even deaf children), responds to human voice
• 4 -5 months: uses many consonants, shows social interest
• 6 months: recognizes words like “no”, mama, dada
• First words are similar across cultures
• 6 -18 months: developing phonological awareness by processing speech melody or prosody as whole units,( not yet processing the spaces or juncture) e.g. “whatdat; aldone”
What is Language?

• Language is the basis for learning
• Reading and writing are forms of language, as is ASL (sign)
• Language components include: grammar, syntax, vocabulary, pragmatics and phonology = speech sounds
Language components

- Phonology
- Orthography
- Morphology
- Syntax
- Semantics
- Pragmatics
- Discourse structure

- Speech sounds
- Spelling patterns
- Morphemes meaningful units
- Sentence structure
- Word and sentence meaning
- Word choice; usage
- Organization of connected language
Healthy Brain

This PET scan of a normal brain of a newborn child shows regions of high (red) and low (blue and black) activity. At birth, only primitive structures such as the brain stem (center) are fully functional; in regions like the temporal lobes (top), which receive input from the senses, are relatively quiescent. Sensitive periods of this type occur in emotional and social development.
How critical is early language experience for learning?

• The most important difference among families was in the **amount of talking**

  *Average welfare child had half as much language experience per hour, and less then one third of the language experience then the professional family.*

  *By age of 4 the average welfare family child has 13 million fewer word experience then professional family child*
Are there innate differences in language development and skills between boys and girls?

- Anatomical brain differences
- Functional brain differences
- Effect on reading acquisition
- Long term Differences???
## Differences start early

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<th>Females</th>
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<td>2x as many conceptions as births</td>
<td>25% lower mortality rate</td>
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<td>99% of speech comprehensible by 4yrs</td>
<td>99% of speech comprehensible by 3yrs</td>
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<td>Play rough, competitive and aggressive</td>
<td>Play quieter more cooperative</td>
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<td>Slower to acquire reading and writing skills</td>
<td>Reads better and sooner</td>
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<td>More likely to ignore voices, even parents</td>
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Neurodevelopment in Preschoolers

• At age 2 child has more neurons than their pediatrician.
• Brain increases in weight 350% in first 2 years of life.
• Huge increase in synapses (20 fold to more than a trillion in the first month of life).
• Brain sculpting is occurring as significant increase in language acquisition. Deleting pathways that are not reinforced.
• Critical time for phonological awareness, grammar and vocabulary development.
Neurodevelopment in Elementary Years

• Brain is becoming highly efficient at skilled practiced tasks that changes the primary “integration” cortex in the parietal lobe.

• Reading and writing are “overlaid” functions that use the hard wired linguistic/phonological machinery

• Motor improvement in distal muscles

• Improved attention
Reading is a learned skill which is only possible because of the brain’s extraordinary ability to make new connections among its existing structures.

When one learns to read, his/her brain is forever changed, both physiologically and intellectually.

– Maryanne Wolf
Neurodevelopment in secondary years

• With basic skill efficiency neocortex is “available” for higher level conceptualization.
• Hormonal changes signal neurologically are resulting in change physically and brain changes to the frontal lobes.
• Improved metacognition including planning and attention. (Metacognitive development and improving executive functioning continues into 2nd to 3rd decade.)

(Should expectations for “sustaining attention” change over time? How do you decide what is “normal”?)
What are the risk factors?

• Language processing difficulty?
• Reading failure?
• Written expression?
• Environmental risks?
• What other risk factors may effect learning in middle and high school students?
Observing behaviors: Questions to ask/answer

- WHAT DOES THE STUDENT STRUGGLE WITH?
- HOW DOES THE STUDENTS WEAKNESSES IMPACT CLASSROOM PERFORMANCE?
- WHAT ARE THE STUDENTS STRENGTHS?
- WHAT DOES THE STUDENT NEED MOST TO WORK ON?
- WHAT SERVICES HAVE BEEN OR NEED TO BE PROVIDED?
- WHAT MODIFICATIONS OR ACCOMMODATIONS HAVE BEEN OR NEED TO BE MADE?
TEACHER OBSERVATION

- Comprehension (oral and written)
- Retrieval/memory
- Attention (distractibility, impulsivity, inhibition, focus, motor restlessness)
- Following directions
- Application of knowledge
- Behavior (compliance, motivation, maturity, social skills)
- Speech/language competence
- Cognitive ability
CASE STUDY

simon
Simon 30 months;

**HISTORY:** Presents with delayed speech and language. Normal birth. Walked around 1 yr.; first words around 11 mo. (*no, Mom, Dad*), but **language did not progress.**

**BEHAVIORAL OBSERVATIONS:** Self-directed, but does allow *intrusion* into his “play space”. Engaged with specific toys for longer periods of time, though typically on his own terms. Simon appeared to learn quickly, relying on visual demonstration, rather than verbal cues. When he didn’t understand what was expected or when he didn’t get his way immediately, he would tantrum. He seems poorly regulated from a sensory standpoint, either *over focused* or at other times *under focused*. **He is inattentive to the speaker/listener, and tends not to make eye contact or respond on a consistent basis to his name or any auditory cue.** When he does make eye contact, however, it is purposeful and engaging. In typically younger interactive games such as “peek-a-boo” and “tickle” games, Simon was notably more reciprocal, laughing and engaging appropriately. At these times eye contact was appropriate and purposeful. Simon was heard to label the words *ball, key, shoe, baby, blocks*, and simultaneously (and appropriately) say *bye*. Overall, **he presents with better developed expressive abilities than receptive**, as he is not yet responding to his name or even inflected command such as “no”. He did not follow simple directions such as, “Give the ball to mommy”, though with demonstration, and once he understood what was being asked of him, he willingly followed such directions. He is not yet able to differentiate pronouns such as *me* or *you*, yet is able to recognize many common body parts, and by report can identify several colors.
Observations

• Atypical behavior?
• Risk factors for ???
• Effect on learning and school performance?
• How/when to treat?
30 months  **RECOMMENDATIONS:**

- Developing imitative skills for motor patterns, prior to attempting demanded speech imitation.
- Developing his ability to follow a simple command.
- Developing and improving consistency in alerting to his name or any language direction.
- Learning to use and understand that language can “effect change”
- Simon’s progress needs to be very carefully monitored with formal re-evaluation in six to eight months. This may change, depending on his progress and status in therapy.
- Simon’s therapy needs also to focus on teaching Simon’s mom techniques for engaging and developing Simon’s language at home. It is critical at this age for Simon to stay “connected” and to be engaged in reciprocal or didactic exchange. This includes imitation of behaviors or motor patterns, not just speech. In fact, initially it will be important not to “pressure” Simon to imitate speech, but rather to encourage him to imitate behaviors and to understand the concept of imitation.
- Improving and developing reciprocal interaction.
Simon  5.7 yr. kindergartener

**BEHAVIORAL OBSERVATIONS:** Simon presented as a happy and enthusiastic little boy with a delightful sense of humor. Though he continues to struggle with organization of his expressive output, his sociolinguistic and pragmatic skills are now appropriately developed and his communicative intent is clear. In more structured testing, Simon continues to have to work very hard at processing and in turn attending. He continues to be somewhat perfectionistic and very concerned about his performance, and as a result can be hesitant if uncertain or sensing success. Simon continues to struggle with his expressive language organization, both in terms of phonological sequencing and word selection, as well as sentential ordering. However, his intent is clear and his pragmatic and sociolinguistic skills have improved remarkably. *Examples include: when trying to describe an ironing board Simon said, “that’s a cooler, it can warm your clothes”. Another example when talking about a waterfall, Simon stated: “cause it’s too down and I would get scared”.*
Diagnosis/Observations

• Does this information change the diagnosis?
• Does this change the treatment?
• Does this effect prognosis?
• How will this effect school?
Simon  5.7 years:

Diagnostically Simon presents with an Auditory Processing Disorder characterized primarily by underlying deficits in rote auditory memory and language integration despite good semantic and basic concept knowledge. Attention and anxiety maybe secondary or co-occurring factors as the demands of ratcheting up attention in order to process language, are fatiguing and Simon tends to tune out or become overwhelmed. It is important for his attention in the classroom to be considered and evaluated in the context of his memory and processing weaknesses.
• As Simon is still young in many ways, and given the struggles he has with the organization of his expressive output, in a pre-first program in a small classroom setting is recommended.  
• When giving Simon assignments it is important to start at a level where he is insured success, and then building upon that.  
• It is important to recognize that mentally he often needs to take “time out” from listening, and thus alerting him as to when it is important to listen will be critical.  
• Simon’s teachers need to be sensitive to his need for both repetition and restatement. When he tunes out, he is more likely to need repetition, but if he is struggling with the complexity of the language, or the integrated demands of the grammar, he is more likely to need restatement.  
• It is recommended that Simon continue to receive speech and language therapy two times a week. Therapy goals need to focus on the following:
  1) Continued work on vocabulary, with particular attention to opposites of more complex words, in part to help with retrieval in conversation.
  2) Continued work on processing, as language increases in length and complexity.  
  3) Continued work on oral story telling, initially using picture cues, but then relying solely on verbal information. 
  4) Provide Simon with strategies to help him pace and in turn organize his output.  
  5) Work on sequencing in his oral language, as well as the concept of sequences, such as yesterday, today, tomorrow, before, after, etc.  
  6) Continue to work on “wh” questions, especially “why” and “how” questions. Simon is often more likely to process high content words and not attend to critical syntactic information in these types of questions.
At home, it is important for Simon’s parents to make a very conscious effort to enrich vocabulary incidentally. Emphasizing common words that are more likely to be absorbed from the environment, and less likely to be learned through direct instruction, such as fire hydrant, curb, file cabinet, outlet, lock, cash register, etc.

The software program, Earobics Level 1, can be used at home to support his developing listening comprehension skills. It is not likely that he will be able to work on this independently, especially as the tasks become more challenging, but given his interest in computers, he could be encouraged to work on the “Earobics” program for a few minutes each time he wants to get on the computer to play other games.

It is important for Simon’s parents to continue to read to him, and in doing so giving him specific information for which to listen. Including books of verse or rhyming books can help to reinforce phonological awareness skills as he develops his reading.

It is equally important to recognize Simon’s developing strengths in understanding number relationships. Incorporating math into daily routines by having him sort coins into appropriately labeled jars, or beginning to play simple card games like “Concentration” or “Uno” can help to reinforce his familiarity with numbers. Simple activities such as having him set the table with five forks, and then asking him if he added one more, how many people would there be at the table, can help to improve his general math thinking.

Homemade word search games where basic sight words or family member names are embedded in a simple background field can continue to work on both word recognition and writing, as Simon is encouraged to trace around the found word. It is important to remember to use a large font in developing these games.

Simon needs to develop strategies to compensate for memory weaknesses including reauditorization, rehearsal and visual imagining. The V/V (Verbalizing and Visualizing) program may be useful.
Classroom signs of a Language Disability:

- Limited vocabulary and difficulty with word retrieval
- Difficulty understanding humor, jokes and making inferences
- Difficulty following directions
- Difficulty organizing spoken (or written) language
- Difficulty retelling an orally read story
Juncture

• Can you understand what this says? Show do you know where the word endings are? Does it take you longer without the juncturer boundaries.
Juncture

- Now how easy is it to know what the words are and where the boundaries are. You can see them, right? And orthographic conventions like punctuation is even more helpful.
- How does that happen in spoken language?
Language Processing Disorder (CAPD)

- **Definition:** Language Processing refers to the brain’s ability to interpret and use information it hears.

- This is a complicated process that involves more than just “listening.” It involves higher order language learning, including attention, memory, synthesizing and word knowledge.

- It is a deficit in processing the information in audible signals (sounds), that is not due to a hearing acuity deficit.

- Language processing difficulty can result from one or more deficits in the ability to **analyze, synthesize, organize, store, retrieve, attend to** and **use** information presented auditorily.
Classroom symptoms of language (and/or auditory) processing deficits

- Difficulty paying attention to and remembering information presented orally
- Difficulty following multi-step directions
- Poor listening skills
- Poor eye contact and pragmatic language skills (especially in preschool children)
- Slow processing speed
- Compromised academic performance (can be in reading, spelling, writing and math)
- Difficulty with learning vocabulary and syntax
- Frequent need to reread to aid comprehension
- Increased anxiety
**Simon 9.5 yrs.** Clinical observations and a comparison of Simon’s performance over time indicates that he is a youngster of age least age appropriate ability who continues to make steady academic progress. On standardized measures of reading and arithmetic, he performs solidly average, with intact reading decoding skills and similarly solid math computation. His quantitative thinking is adequate, and he is beginning to read purposefully for meaning. Written language in many ways parallels Simon’s difficulty with oral expressive language, as it can be poorly formed and targeted with lengthier demands, although adequate at the single word level with good spelling and a beginning development of attention to orthographic conventions. Despite Simon’s solid academic performance, he continues to struggle with language processing and oral expression. He misses the syntactic information and the linguistic *importance* of word order. His spontaneous language similarly reflects organizational difficulties, as well as difficulty with language *usage* and accurate grammar, especially relative to irregular verbs and word endings. Despite this, Simon’s communicative intent is appropriate, and he is now more on target from a pragmatic and sociolinguistic perspective. Diagnostically, he presents with a mild to moderate Auditory Processing Disorder, in combination with an Expressive Language Disorder and “at risk” for a Written Language Disorder.
What to do for Simon

• Accommodations vs. modifications
• Teacher
• Parent
• Child
• Therapist/physician

(remember to reinforce strengths)
1. Simon is easily overwhelmed by work papers that he either considers too challenging or too demanding in terms of the quantity. It will be helpful to break lengthier work sheets down into multiple pages, with less items on a page, helping to reduce his anxiety. This will also provide him with some break time as he can complete one page and then touch base with the teacher for approval before receiving the next page.

2. Simon needs to have directions both restated and repeated. At times, having him restate a direction may help to ensure his comprehension of the information. It is important to alert Simon to those times when he will need to heighten attention to processing, and whenever possible to reduce background noise distractions, prior to giving him directions.

3. Simon continues to struggle with multi step directions, especially those that require his understanding to word order, in order to understand the direction. Whenever possible, oral directions should be paired with pictures or visual demonstration, and even the printed word with key words highlighted.

4. Simon continues to struggle with synthesizing information or seeing the big picture. In other words, although he may recognize all the subcomponents or the “trees”, he is less likely to recognize the “forest”. Previewing for him, or giving him an overview or big picture that clearly delineates the main idea or theme will help him as he then listens to instruction or directions.

5. When reading the story to him, it is important to give him the main idea or specific information for which to listen. Parents are encouraged to continue to read to him regularly, as this will allow opportunity for him to enrich his vocabulary by defining or describing new words, as well as to help direct his listening comprehension.
5. It is important to emphasize critical math vocabulary, such as *sum, some, half, few, quarter*, etc.

6. Simon is strong in his visual reasoning and problem solving, and it is equally critical to enrich and reinforce these skills. Games like Battleship, Connect Four, not only target turn taking, but also planning and spatial thinking. Games like Brain Quest or Guess Who can help to enrich his fund of knowledge and to get Simon to work on identifying critical elements or attributes, and targeting specific questions.

7. The catalogue, Bits and Pieces, has several games and books that target developing logical and lateral thinking that will help to improve Simon’s language flexibility, as well as puzzles that are three-dimensional, again to reinforce his strengths in spatial problem solving.

8. It is important in school to make a conscious effort to **pre-teach** new vocabulary and to preview for Simon by giving him the overview or big picture. Strategies that target verbalizing and visualizing (a Lindamood Bell Program), can help develop his listening and reading comprehension skills.

9. In this setting, Simon benefitted from small, quiet little toys with which he could fidget. He is a child who is quite physically and motorically restless, often pacing or standing, or playing with an object. Providing him appropriate fiddle toys may help to channel this energy and allowing him some leeway whether it’s for pacing or standing at the desk, would also be beneficial. Preferential seating with Simon seated at the end of a row, though perhaps close to the teacher, is recommended.
10. Simon needs to continue to receive language therapy to address both his oral and written expressive language disorganization and his auditory processing deficits. Specific language goals should include:

- Improving his ability to sequence and retell an orally read story, initially with the benefit of picture or visual cues, and then independent of these cues.
- Increase Simon’s ability to self monitor his own language.
- Improve Simon’s sentence structure, including attention to irregular verbs and subject
- Improve Simon’s language structure and ability to sequence and accurately describe an event or the rules of a game, etc.
- Efforts should be made to significantly enrich Simon’s vocabulary, especially targeting syntactic information to include words like because, instead, unless, although, until, otherwise, neither, however, as soon as, in order to, even though, and sequencing words specific to language like before and after.
- Goals should continue to work on Simon’s ability to recognize and describe relationships between common objects or concepts, identifying an essential feature or main idea, rather than a tangential detail. For example, knowing that a pillow and a blanket go together because they are used to sleep with or they are both on a bed, rather than they are both soft or white.
- Continuing to work on categorizing at a higher level of words that might be synonyms or have concepts in common.
- Simon needs specific work on being precise and directed in his expressive language.
- Simon needs to work on how to formulate sentences given a targeted word once he has a good understanding of that word.
TO DO LIST FOR LANGUAGE/AUDITORY PROCESSING DISORDER
Preschool and early elementary:

1. Simplify language and present information slowly
2. Pair auditory information with gesture, pictures, objects or other visual information
3. Encourage eye contact and language reciprocity
4. Teach “wh” questions (“what, who, where” and the “why, how come, when”)
5. Improve semantic knowledge by teaching word attributes and synonyms
6. Develop categorizing skills, including likenesses and differences develop story telling and story sequencing skills.
7. Directly teach math vocabulary including temporal- spatial concepts.
8. **Restate** more complex information and **repeat** shorter, but memory dependent directions.
9. Tell child to “turn their ears on” when it is important to listen.
10. Minimize background noise.
11. Encourage listening activities.
12. Use barrier games and other board games that encourage language reciprocity.
13. Emphasize the “syntactic glue” that strings high content words together.
14. Computer programs like Earobics (level1 and 2)
S.P.E.E.CH (for CAPD/Language processing disorders)

S = State the topic to be discussed
P = Pace your conversation with pauses for comprehension
E = Enunciate clearly
E = Enthusiastically communicate using gestures and appropriate body language
CH = Check comprehension before changing topics
Expressive Language Disorders

- Expressive language disorders can have many different behavioral manifestations because expressive language has many different components.
  1. speech articulation (can effect spelling and phonics)
  2. vocabulary knowledge and retrieval
  3. language sequencing, usage and knowledge of grammar
  4. organization of thought
  5. sociolinguistic and pragmatic skills
  6. visual motor coordination deficits (writing)
  7. Speech Apraxia (motor planning deficit)
Strategies

- **Semantics- Word Learning:**
  - teach new words in the context of something familiar
  - use a word multiple times in many ways
  - use a word in different grammatical context

- **Grammatical Learning:**
  - highlight endings and root words, emphasize superlative and comparative
  - find words within words
  - play with the grammar

- **Phonological Learning:**
  - segmenting sentences and words
  - discriminating and producing rhyming patterns
  - deleting and blending sounds
Humans were not born with the ability to read.
Man invented reading about five thousand years ago.
It is one of the single most remarkable inventions in history.
Reading

• Reading relies on brain circuits that are already wired for language, i.e., reading is an “overlaid function”
• fMRI shows 2 pathways for mapping reading:
  • 1 for beginning readers (Broca’s, parietal-temporal)
  • 1 for skilled readers (occipital-temporal)
Word Processing in the Brain
Areas of the Brain Used for Reading

- Sound-symbol Connection
- Word Meaning
- Letter Recognition (orthographic processing)
- Phonological Processing
A

Controls

B

Dyslexics

C

Controls vs Dyslexics

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Dyslexic teens who at baseline showed greater activation and organized white matter frontal region connectivity in the rt. inferior frontal gyrus showed greater reading improvement over 2 ½ yrs. (Hoeft, Stanford Univ)
Neurological risk factors

• 40% of children with delayed speech and language onset are at risk for reading failure or associated learning disabilities

• 40% genetic predisposition for dyslexia
At-Risk behavioral manifestations for early diagnosis of reading disability (Dyslexia)

- Deficits in phonological awareness
- Deficits in phonological sequencing (transpositions)
- Deficits in immediate or short term auditory memory
- Deficits in word or phoneme retrieval
- Genetic history
- Delay onset of speech and language
Stumbling Blocks to Becoming a Good Reader

- Difficulty learning to read words accurately and fluently
- Insufficient vocabulary, general fund of knowledge and reasoning skills to support comprehension of written language
- Lack of motivation to read and a failure to develop a mature appreciation of the rewards of reading
The impact of reading

The Practice Effect
(Torgenson)

Words per year of exposure

Student Performance (%)
• Oral language is unsegmented or fluid.

• Our brains are wired to learn to speak and to understand the spoken word.

*When a child hears the word *cat*, he/she hears one unit of sound. The child then assigns meaning (semantics) to the word.*
Written Language

• Written language (learning to read and write) is segmented.

• It is made up of individual sounds in words and sentences.

*In order to read or write cat, the child needs to be aware that this single unit of sound is actually made up of three letters, each having an individual sound.* (phonemic awareness)
•No one program is more powerful than another. There is no “magic bullet.”

-G. Reid Lyon

•Programs which systematically and explicitly teach phoneme awareness and sound-symbol relationships (grapheme-phoneme) are far more successful in dealing with reading disabilities than other programs. —Torgesen and Wagner (Florida State University)

•It is essential that teachers have strong knowledge about reading development, reading difficulties and research-based instruction. 

-Louisa Moats

•“Teachers teach students, not programs. A good teacher can use a Sears catalogue to teach a child to read.”

-Dr. Gerald Tirozzi
The Reading Process

- Comprehension
- Fluency
- Phonology
- Oral Language
What are the risk factors?

- Language processing difficulty?
- Reading failure?
- Written expression?
- Environmental risks?
- What other risk factors may effect learning in middle and high school students?
Classroom “signs” of a reading disability:

- Trouble with alphabetic learning; connecting sound to print; rhyming
- Difficulty remembering the letter names or “hearing” the sounds
- Difficulty with sound sequencing or sequencing in general (days of the week, months of the year etc.)
- Difficulty with any ideographic learning, such as number names; confuses math symbols
- Difficulty with spelling
- Difficulty with word retrieval
- Difficulty understanding what they read
Key to reading instruction for readers struggling to learn to read

• Explicit instruction
• Systematic instruction
• Intensive instruction
CASE STUDIES

Andre and Tim
Andre  5.1 yrs.  Montessori kindergarten
Referred by the teacher and parents to look comprehensively at his learning profile of strengths and weaknesses, in light of disproportionate struggle with learning the alphabetic code in the context of an otherwise clearly “intelligent” little boy.  **There is a significant genetic history of Dyslexia paternally.**

**SUMMARY AND RECOMMENDATIONS:** In addition to a genetic history of dyslexia, Andre presents with a cluster of behaviors that make him at even greater risk for expressing a dyslexic profile, including: compromised immediate rote auditory memory skills; difficulty with sequencing; poor rapid automatized naming; and difficulty with producing and discriminating rhyming patterns. There is a developmental range within which children acquire reading, and there is no direct correlation between intelligence and early reading, however Andre’s weak rote auditory memory skills and his significant struggle with learning the alphabet code appears to be more pronounced than one would see as a result of developmental maturation.

The benefits of early intervention, as a prevention for reading failure is well documented.
1. It is recommended that reading instruction be approached aggressively in terms of the systematic nature of the program used, the intensity of the service delivery, and the explicit nature of the type of program. A multi sensory methodology (Orton Gillingham) should be used, but in the context of a structured and explicit reading program, such as the Lindamood Bell programs (LIPPS, SEEING STARS), Phonographics, the P.A.T. Spell Read Program, or the Wilson Reading System (FUNDATIONS), or similar type programs.

2. Reading instruction should be incorporated into Andre’s day at school. Summer tutorial should be intensive targeting 8 – 10 hours a week of systematic, explicit and intensive reading instruction.

3. Andre will need enormous repetition and practice in these early years, in order to master the alphabetic code, with expectation that he will learn these pre-requisite skills to become a competent reader.

4. Programs such as “Earobics Level I” and “Leapfrog” can help to develop his phonological awareness skills, a critical reading precursor.

5. Andre’s parents should continue to read to him, incorporating books of verse that will help to reinforce phonological awareness development.
6. Homemade word search games, or in this case letter search games, where a single letter or two letters are embedded into a simple background field, can target both letter recognition and writing, by having Andre trace over the found letter, for example making all the B’s blue, and G’s green. Also, embedding high interest words, such as Andre’s name or family member names into a simple background field can target word recognition.

7. It is equally important to continue to nurture and encourage Andre’s strengths, working directly on his developing mathematical thinking skills by having him continue to count with correspondence and work on number line sequencing. Tiles with numbers 1 through 10 printed on them can be used to work on number patterns and number line sequences by removing a tile and asking Andre to find the missing tile, or by placing the tiles face down and having them sequenced in order as selected.

8. Andre’s progress needs to be carefully monitored, as he may well need adjustments to the interventions, based on his progress, rate of growth and overall performance. The goal in aggressively intervening with tutorial is to be able to have Andre be successful in the mainstream given accommodations and a “wrap around” service. However, his rate of progress will be a far better indicator of the intensity of treatment needed, and for what period of time, rather than any single assessment protocol.
A total reading program includes systematic phonics instruction integrated with other reading instruction in phonemic awareness, fluency, and comprehension strategies.
Strategies

- **Semantics- Word Learning:**
  - teach new words in the context of something familiar
  - use a word multiple times in many ways
  - use a word in different grammatical context

- **Grammatical Learning:**
  - highlight endings and root words, emphasize superlative and comparative
  - find words within words
  - play with the grammar

- **Phonological Learning:**
  - segmenting sentences and words
  - discriminating and producing rhyming patterns
  - deleting and blending sounds
Growth required for older readers between 3rd – 10th grades to maintain skills

- Automatically recognize 1000’s of new words
- Learn word meanings
- Increase general fund of knowledge
- Improve thinking and reasoning skills
- Utilize more complex reading comprehension strategies
Who, What and When?

- Remediation
- Modifications
- Accommodations
- Strategies

- Student
- Teacher
- Tutor
- Parent
- Special program
Tim is a 15 year, 5 month old left-handed male currently in the 9th grade. It was reported that Tim showed clear signs of difficulty with reading acquisition by 3rd grade, and has been tutored regularly through 6th grade, completing the Spell Read Program reportedly with good benefit. Historically, Tim was diagnosed with an Auditory Processing Disorder. He has continued to struggle with processing speed.  

**BEHAVIORAL OBSERVATIONS:** Tim is a verbally engaging and charming young man who was highly cooperative and participatory. He is, however, quick to give up, especially as tasks become more challenging, and he is limited in his mental persistence. He approached math tasks with greater ease and speed, and in contrast was likely to “wear out” more quickly with reading tasks. For this assessment, he demonstrated good sustained attention with no evidence of impulsivity or overt distractibility.

**ACADEMIC PERFORMANCE:** The Woodcock-Johnson-3, Tests of Achievement, the Wechsler Individual Achievement Test-2, the Nelson Denny, Form G, Reading Comprehension and Reading Rate Subtest, the Comprehensive Test of Phonological Processing (CTOPP), and the Test of Word Reading Efficiency (TOWRE) were administered to evaluate Tim’s academic skills in reading, arithmetic, spelling, written language and critical reading precursors, as compared with chronological age peers in the population at large. Overall, he presents with a “classic” dyslexic profile, as he struggles significantly not only with reading speed but with reading mechanics in terms of decoding. However, with short passages and under extended time conditions he is able to adequately gain meaning from print. He demonstrates strengths in his quantitative reasoning, though math fact automaticity again reflects an across the board compromise to his production speed. Written language too is characteristic of the Dyslexic profile, with less well developed spelling in context, limited vocabulary (and probably likely in an effort to compensate for poorer spelling), and less well developed or extended expository writing. He is able to gain meaning from print, despite his poor efficiency and competence with decoding. For short passages, as assessed by the Passage Comprehension Subtest of the WJ-3, he achieves a standard score of 103, though his reading comprehension rate drops off dramatically with demands for lengthier, more integrated reading that taps as well into working memory. Thus, even under extended time conditions on the Nelson Denny, Form G, Reading Comprehension Subtest, he performs only at the 9th percentile (HE DID NOT FINISH EVEN WITH EXTENDED TIME), and at the 7th percentile under timed conditions.
**SUMMARY AND RECOMMENDATIONS:** Tim is cognitively capable, but with a pattern of weaknesses on measures of decoding, critical reading precursors, such as rapid automatized naming, that is consistent with a moderate Dyslexia and concomitant Written Language Disability. In many ways Tim is the prototypical “recovered dyslexic” as he has had benefit from longstanding tutoring and the intensity and explicit nature of the Spell Read Program, but remains a slow reader, inefficient in decoding and encoding, yet age appropriate in terms of his ability to gain meaning from print. Not surprising, he cannot sustain reading, and his reading comprehension deteriorates as the demand for lengthy and sustained reading increases. Tim, however, will continue to compensate and be benefitted by his good intellect and motivation, though he is equally likely to limit his independent reading and writing, as it is so laborious for him. On the other hand, he will benefit from his well developed verbal abilities, good listening comprehension and attention, and as he becomes more aware and adept at using strategies and compensatory skills, he should have good access to all kinds of information and, in turn, equally good long term academic success.
Recommendations (Tim)

Accommodations
- Recorded text
- Reader for standardized tests
- Extended time
- Laptop; spell check
- No penalty for spelling errors
- Text to speech software
- Speech to text software
- Teacher prepared outline or syllabus

Remedial
- Practice at listening to recorded material and software programs
- Sustained reading for 30 min daily; use hi interest material
- Tutorial in written language
- Brainstorm writing projects with an adult “scribe”
- Teach spelling recognition
- Master the 1000 most commonly used words in writing and 100 most common misspelled words
Recommendations (Tim)

**Strategies**
- Preview test and literature (teach techniques)
- Use abridged notes
- Watch movies or video when available
- Work in study groups

**Modifications**
- Foreign language exemption
- Limit/ adjust course load
- 5 year college plan
Lo-tech Hi-tech strategies for reading comprehension

• PRACTICE
• Shared reading
• Books on tape
• Systematic instruction in comprehension strategies
• previewing

• Inspiration
• Kidspiration
• Stories and More
• PowerPoint
• Dragon
• Idioms
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CASE STUDY INFORMATION WORKSHEET

1. AVAILABLE DATA:
   * Identifying Information (age, gender, native language)
   * Achievement Testing/Scores
   * Cognitive Testing/Scores
   * Language Testing/ Scores
   * Teacher Observations (comprehension, retrieval/memory, attention, following directions, application of knowledge, etc.)

1. What does the student struggle with?
2. What are the students’ strengths?
3. What does the student still need to work on?
4. What services have been provided?
   * Language Testing/ Scores
5. What questions/ concerns do you have about the student?