

**Reading Between the Lines:
A Connection Between Dyslexia, Dyspraxia,
Dysgraphia, and Speech Delay**

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CO-EXISTING CONDITIONS

- ▶ More than half of children in two different groups of poor readers (severe dyslexia or teacher referred poor readers) had total motor impairment scores indicating severe motor difficulties, compared to 14% of the control group (Iversen, Berg, Ellertsen, & Tonnesen, 2005)
 - ▶ Significant differences were seen in total motor impairment, manual dexterity, and balance tasks; no significant difference in ball skills
 - ▶ Results also indicated that many children with reading difficulties experience difficulties with the motor requirements for handwriting
- ▶ Dyslexic group had significantly poorer Total Balance scores than control group – when further assessed, significant difference was in static balance tasks as opposed to dynamic balance tasks (Getchell, Pabreja, Neeld, & Carrio, 2007)
 - ▶ No significant difference in manual dexterity or ball skills.

CO-EXISTING CONDITIONS

- ▶ Another study reported that 20% of children with "very significant reading difficulties" also had "very significant motor difficulties". However, so did 5% of average and 10% of above average readers. (McPhillips and Sheehy, 2004)
- ▶ One study reported comorbidity of primary dyspraxia diagnosis with secondary dyslexia at 50% and primary diagnosis of dyslexia with secondary dyspraxia at 85% (Pauc, 2005)
 - ▶ Small sample size and biased population must be taken into account
 - ▶ Primary dyslexia also comorbid with ADD (62%), ADHD (21%), and OCD (17%)
 - ▶ Primary dyspraxia also comorbid with ADD (70%), ADHD (36%), and OCD (21%)
- ▶ Researchers are still asking:
 - ▶ Are all of these "diagnoses" really more "symptoms" of something larger?
 - ▶ When co-existing conditions are present, is it an indicator of cerebellar dysfunction?

WHAT DOES DYSPRAXIA LOOK LIKE?

- ▶ Uncoordinated, clumsy, bumps into things
- ▶ Difficulty learning to walk, run, skip, ride a bike, play sports, etc
- ▶ Difficulty establishing a dominant hand (being ambidextrous is NOT typically a good thing)
- ▶ Messy eaters
- ▶ Poor pencil grip
- ▶ Having difficulty holding onto objects
- ▶ Difficulty with fasteners (buttons, snaps, zipper) and shoetying
- ▶ Decreased confidence or increased frustration with motor tasks
- ▶ Difficulty learning new skills
- ▶ Difficulty engaging in games or on the playground with other children
- ▶ Avoidance of active play, prefers sedentary play (TV, video games, etc.)

TIPS FOR ADDRESSING DYSPRAXIA

- ▶ Get child involved in active play (e.g. playgrounds, games, sports, gymnastics, dance, karate, etc.)
- ▶ Allow times for safe risk taking and exploration
- ▶ Give short, simple directions (maybe even one at a time)
- ▶ Encourage play dates and making friends for peer interaction and exposure to other play styles
- ▶ Allow frequent short breaks (get up and move!)
- ▶ Allow extra time for assignments
- ▶ Seat closer to the board
- ▶ Lots of positive reinforcement!
- ▶ Practice! Practice! Practice!

WHAT DOES DYSGRAPHIA LOOK LIKE?

- ▶ Poor pencil grasp
- ▶ Difficulty forming letters and shapes
- ▶ Difficulty with understanding upper and lower case
- ▶ Mixing writing styles or upper/lower case, variable sizes/shapes
- ▶ Difficulty staying in the lines or within margin when coloring or writing
- ▶ Difficulty with proper spacing between and within words
- ▶ Requiring increased time to complete written assignments
- ▶ Avoidance of written assignments
- ▶ Difficulty spelling even familiar words
- ▶ Using a lot of erasures and cross-outs while writing
- ▶ Difficulty thinking of words to write
- ▶ Needing to say the words out loud in order to write them

TIPS FOR ADDRESSING DYSGRAPHIA

- ▶ Allow extra time for written assignments
- ▶ Allow typing or a scribe for longer assignments (or when writing is not the focus of the task – i.e. spelling, reading comprehension questions, content based essays)
- ▶ Provide copy of notes so student can follow along instead of worry about note taking
- ▶ Allow use of print or cursive – whichever is more legible
- ▶ Allow child to use writing instrument that is most comfortable
- ▶ Use graph or lined paper turned sideways (columns) for math
- ▶ Use multisensory approaches when teaching writing
- ▶ Do NOT avoid writing! Teach the skills! This is an important life skill!

HOW CAN THERAPY HELP?

- ▶ Physical Therapy
 - ▶ Gross Motor Coordination
 - ▶ Balance – static and dynamic
 - ▶ Bilateral Integration
- ▶ Occupational Therapy
 - ▶ Fine Motor Coordination / Manual Dexterity / Visual Motor Integration
 - ▶ Handwriting
 - ▶ Bilateral Integration
- ▶ Speech-Language Pathology
 - ▶ Phonological Awareness
 - ▶ Segmenting syllables
 - ▶ Segmenting sounds
 - ▶ Rhyming

INTERVENTION

- ▶ Multisensory approach to learning for all therapies
 - ▶ Pairing a motor movement with a sound
 - ▶ Drawing letters in the air using big arm movements
 - ▶ Writing letters in various mediums (sandpaper, shaving cream, gel, etc.)
- ▶ Physical Therapy
- ▶ Occupational Therapy
 - ▶ How to find a Sensory Integration Certified therapist in Indiana:
<http://www.wpspublish.com/store/Training/TherapistIndex?letter=40321>
- ▶ Speech-Language Pathology
- ▶ Referral to dyslexia program, developmental optometrist, developmental pediatrician, and/or neuropsychologist if needed

EARLY INTERVENTION

- ▶ "Language delays and disabilities are often identified when children are 5 years of age or older...the second and third years of life represent a period of rapid change in children's language acquisition." (Lyytinen, Eklund & Lyytinen, 2005)
- ▶ All toddlers with speech delay (expressive, receptive, or expressive/receptive) performed below the expected level on oral reading and reading comprehension tasks at the end of second grade.
- ▶ 8/12 toddlers with expressive and receptive delay had difficulty with literacy skills at the end of second grade
 - ▶ Only 2/12 reached an expected level of reading skill

EARLY INTERVENTION

- ▶ Receptive language delay led to the most reading difficulties with expressive language delay leading to minor weakness in skills
- ▶ However, children with familial risk for dyslexia along with expressive and/or receptive language delays were highly likely to never catch up on their literacy skills.
 - ▶ Half of them also had at least minor delays in gross and fine motor development
- ▶ "It is important to note, however, that many children who are at familial risk for dyslexia but do not show delays in early language, still face problems in reading and/or spelling." (Lyytinen, Eklund & Lyytinen, 2005)

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