

Learning Disabilities

Learning Disorders

- In order to meet DSM criteria, performance in reading, mathematics, and/or written expression must be below what would be expected for someone of the same age, schooling, and intelligence, and must also significantly interfere with academic achievement or daily living
- The different learning disorders overlap and build on the same brain functions, hence people can have more than one form of learning disorder

Diagnosis

- Despite some evidence that *discrepancy model* does not accurately reflect learning disordered phenomena, it is widely used to diagnosis LD
- LD diagnosis if large *discrepancy*
 - Cognitive *ability* (IQ tests) and how child is actually performing (*achievement* tests)
- LD implicated if large discrepancy
 - IQ Verbal – IQ "Performance" (Math, Spatial)

Learning Disorders: READING

- Reading Disorder: Dyslexia
 - most common underlying feature is inability to distinguish or separate sounds in spoken words
 - often a difficulty learning basic sight words, such as: the, what, laugh, said
 - often errors in reversals (b/d, p/q), transpositions (was/saw, scared/sacred), inversions (m/w, u/n), and omissions (place for palace, section for selection)
 - core deficits in reading disorders are in decoding- breaking a word into parts rapidly enough to read the whole word- coupled with problems reading single, small words

READING cont'd

- Reading achievement substantially below that expected given a person's age, intelligence, and education
- This disturbance significantly interferes with academic achievement and activities of daily living
- Reading difficulties **not accounted for** solely by sensory deficits

Dyslexia Simulation

- [www.dyslexia-
australia.com.au](http://www.dyslexia-australia.com.au)
- Davis: *Gift of Dyslexia*
- 40 Variations of the word CAT

CAT TAC TAO CVA
CAT TAC TAC CVA
CAL TAC TAC CVA
ACT TCA TCA VCA
ACT TCA ACT TCA
ACT TCA ACT TCA
ATC TCA TCA TCA
CTA ATC CTA CTA
ATC TCA TCA TCA
ATC TCA TCA TCA

In this example of text, the section is clearly parsed and can be easily read

**Int his exam pleoft extrt he sect
loni snot cle arlys egmen tedan
dis dif ficu ltore ad**

Learning Disorders: NONVERBAL

- Mathematics Disorder
- Non-verbal learning disability
 - difficulty in recognizing numbers and symbols, memorizing facts, aligning numbers, and understanding abstract concepts
 - may have problems in visual-spatial ability
 - core deficits in arithmetic calculation and/or mathematics reasoning abilities
 - underlying neuropsychological processes are believed to be underdeveloped or impaired

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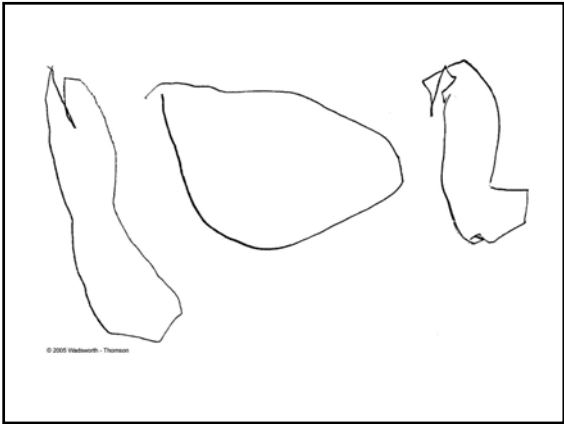
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Figure 11.2 An example of a calculation error that shows errors suggesting spatial difficulties and directional confusion.

**Learning Disorders:
WRITTEN EXPRESSION**

- Writing Disorder:
 - children with writing disorders typically produce shorter, less interesting, and poorly organized essays, and are less likely to review spelling, punctuation, and grammar
 - often associated with problems with eye/hand coordination (which leads to poor handwriting), despite normal gross motor development
 - commonly found in combination with a learning disorder in reading or mathematics

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Prevalence

- Estimates range from 2% to 10% of the population
- Reading disorders most common (and overlap considerably with math and writing disorders), followed by mathematics disorders, and then writing disorders (rare when not associated with another LD)
- More common in males (most likely reflecting a referral bias due to comorbid behavior problems)
- Social and cultural factors may affect how children with LDs are identified and diagnosed

Developmental Course

- Many children with LDs are at risk for social and psychological problems, including poor academic self-concept, depression, behavior problems, social skills deficits, and dropping out of school
- LDs often life-long, although in adulthood individuals may excel in areas not related to their difficulties
- In the long-run, women with LDs have more adjustment problems, especially with respect to relationships

Causes

- Most likely cause is genetic-based neurological problem
- Most LDs stem from difficulties bringing together information from different brain regions into "convergence zones" where it is integrated and understood
- Reading and language-based problems appear to be associated with cellular abnormalities in brain's left hemisphere, especially in the planum temporale

Causes (cont.)

- Lower activation in primarily the left hemisphere of the brain has been found in children with dyslexia
- Language-based LDs may be associated with "timing" deficits at the level of the nervous system, resulting in problems in visual and auditory discrimination
- Non-verbal learning disabilities may result from deficits in right hemisphere brain functioning, and have been linked to prenatal and early childhood disease and trauma

Treatment and Prevention of LDs

- **Direct instruction** is often best for children with LDs- a straightforward approach to teaching based on the premise that to improve a skill, the instructional activities have to approximate those of the skill being taught
- Behavioral strategies & accommodations focus on slowing down the presentation of material, breaking learning into manageable steps, making learning highly structured, and employing reinforcement and practice opportunities

Treatment and Prevention (cont.)

- Cognitive-behavioral approaches teach children to monitor their own thought processes and emphasize the use of strategies such as self-monitoring, self-assessment, self-recording, and self-management of reinforcement
- **Assistive technology** can help children to distinguish sounds and improve language understanding and employ compensatory techniques
