Developmental Dyslexia

Definition:

Reading development lags behind other academic abilities despite absence of sensory deficits. Adequate opportunity for learning to read has been provided.

Sometimes require reading level to be 2 yrs below grade level while other skills may be at grade level.
“Jackie”

Case reported by Margaret Snowling (1992)

Age: 10 yrs, 10 mos
WISC IQ scale: 115, verbal 98, performance 131
Schonell Graded Word Reading Test: 8 yrs. 6 mos
Schonell Spelling test: 8 yrs. 0 mos

Subscales of WISC:
Superior performance on object assembly, block design
Impaired performance on digit span, arithmetic
Language skills

Speech halting, hesitations (describing a picture of a picnic):

“So they set out… they went…they went… I mean… and… so they had their picnic, and about an hour…no a few minutes……they….they packed up…and… got onto their bikes”

Phonological errors in picture naming:
Escalator -> exclavator
Stethoscope -> telescopic thing, st-stesesemator
Cognitive Deficit Approach

Find out how dyslexic children differ from children without reading disorder

1. Visual perceptual deficit - b/p, was -> saw confusions
   Rapid visual processing deficit found in some studies, not others

   Problem: often the tests involve working with orthographic materials, dyslexics may be poorer because they have less exposure to print.

   E.g., studies that have compared copying of English vs. Hebrew characters at short exposure durations have found deficit for English, not Hebrew
2. Verbal deficit

A. Verbal stm deficit
B. Slow picture naming
C. Poor phonological skills - rhyme judgments

Phonemic awareness: Debate over the importance of this. Is deficit causal or result of reading difficulty
Morais showed that non-literate adults had difficulty with phonemic segmentation

D. “fast-for-word” approach (Tallal) rapid auditory processing deficit
Individual Differences

Reading a complex skill, any component of which might be impaired

Castles and Coltheart:

Some children show a phonological dyslexic pattern (word reading better than nonword reading)

A smaller group shows surface dyslexic pattern (regular words and nonwords read relatively well, irregular words read poorly)
Dual (Triple?) Route Model

Letter identification → Visual Input Lexicon

Semantic system

Visual Input Lexicon → Phonological Output Lexicon

Grapheme-phoneme conversion

Phonological Output Lexicon → Phonemes
Case A. H.
McCloskey & Rapp (2000)

College student at prestigious university

Visual-spatial deficit:

Target

AH’s copy
Reading simple words: 88% correct

Reading Errors:

dog  hog
pen  den
lamp  lamb
snail  nails
chain  cabin
hand  band
nose  noise
church  cherish
apple  appeal
Knowledge-based constraint (i.e., top-down effects in reading text)

1. reading words in context much more accurate

2. reading aloud normal text, made sequencing errors much more often than controls - but where unimportant speed and determination -> determination and speed

3. reading sequence altered text aloud

e.g., The horse had learned to him recognize

RH spontaneously corrects 85% of the time, controls 24% of the time
Effect of flicker on word reading:

Steady light  Flicker

23% errors  1% errors

Opposite of prediction from fast visual processing deficit hypothesis

Transient vs. steady-state visual systems
Eye Movements in Reading Text

Foveal region: 1 - 2 degrees visual angle
Parafoveal region: 5 additional degrees
Peripheral: anything beyond

Typically readers fixate 200-300 ms, move eyes forward 8 characters
Perceptual span:

Moving window paradigm -

“A few things led me to mistakenly conclude that the candidate..”

X xxx xxxxxx xxx xx xx xxxxxxxxx end of mistake

X xxx xxxxx xxx xx xx xxxxxxxxx conclude that the canxxxxx
In English: 3-4 characters to left of fixations, 15 to right

In Hebrew: reverse

word identification span smaller - only 5-7 characters to right of fixation

boundary technique - change word after eye moves past boundary

first few letters of parafoveal word picked up
Selective Attentional Dyslexia
Rayner, Murphy, Henderson & Pollatsek

40 yr old college professor, life-long reading problems

single word reading abilities normal

moving window paradigm
Attentional dyslexia

- **Reading rate (words/min)**
- **Window size**
  - 1w
  - 2w
  - 3w
  - Full line

- **Control**
- **SJ**
- **Other dyslexic**