PSYC 3320/5597: Psycholinguistics

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Unit 5 – Reading

How do we read?

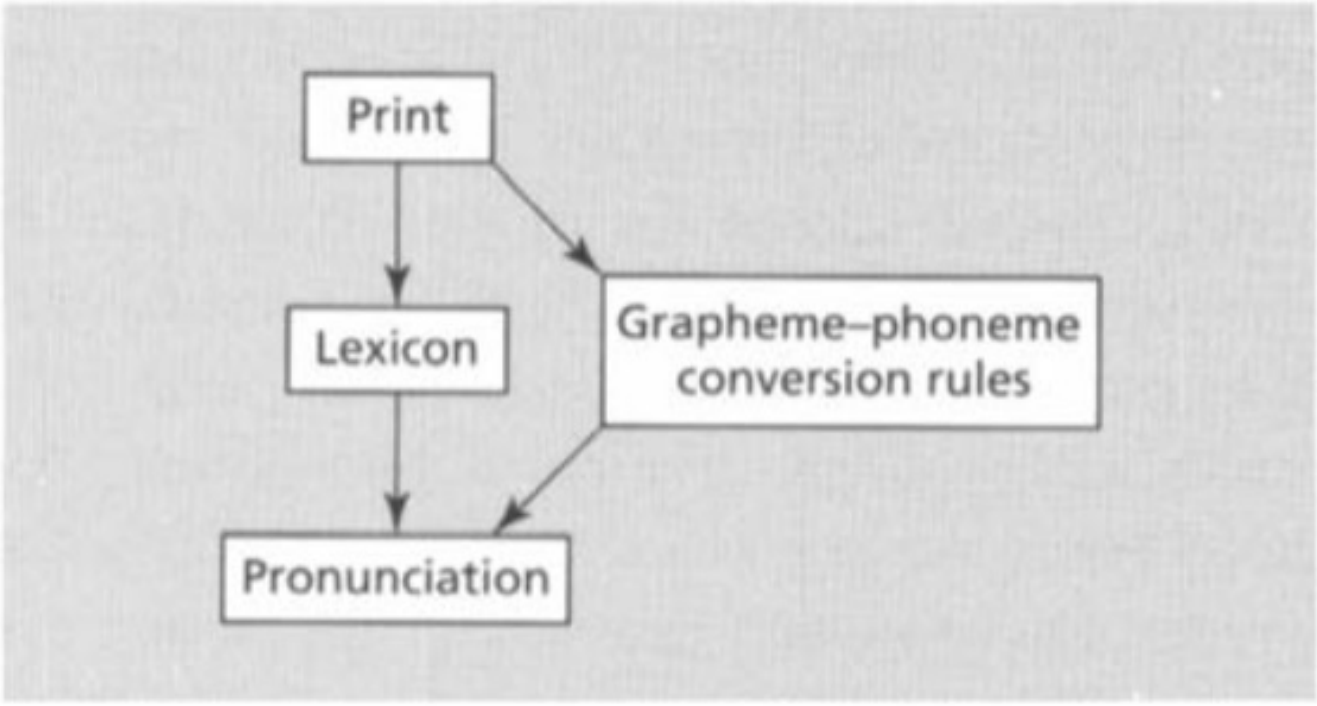
One of our goals in this unit is to develop a model of how we read.

- Recall: a model is simply a way to explain observed facts/data

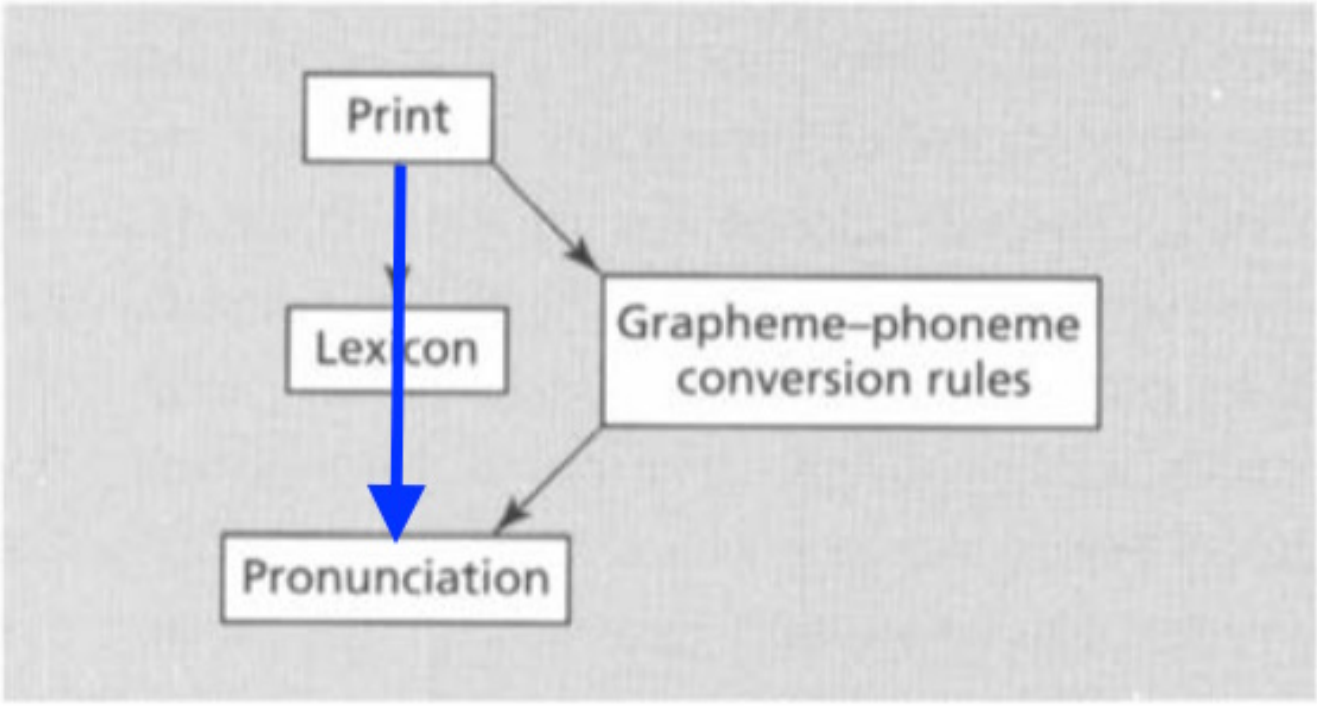
Data/facts about reading:

- some words are pronounced exactly as they are spelled
  - "grapheme $\rightarrow$ phoneme" mapping
- some words do NOT sound like they are spelled (irregular words)
- we can pronounce many "words" we have never seen before

Dual route model of reading



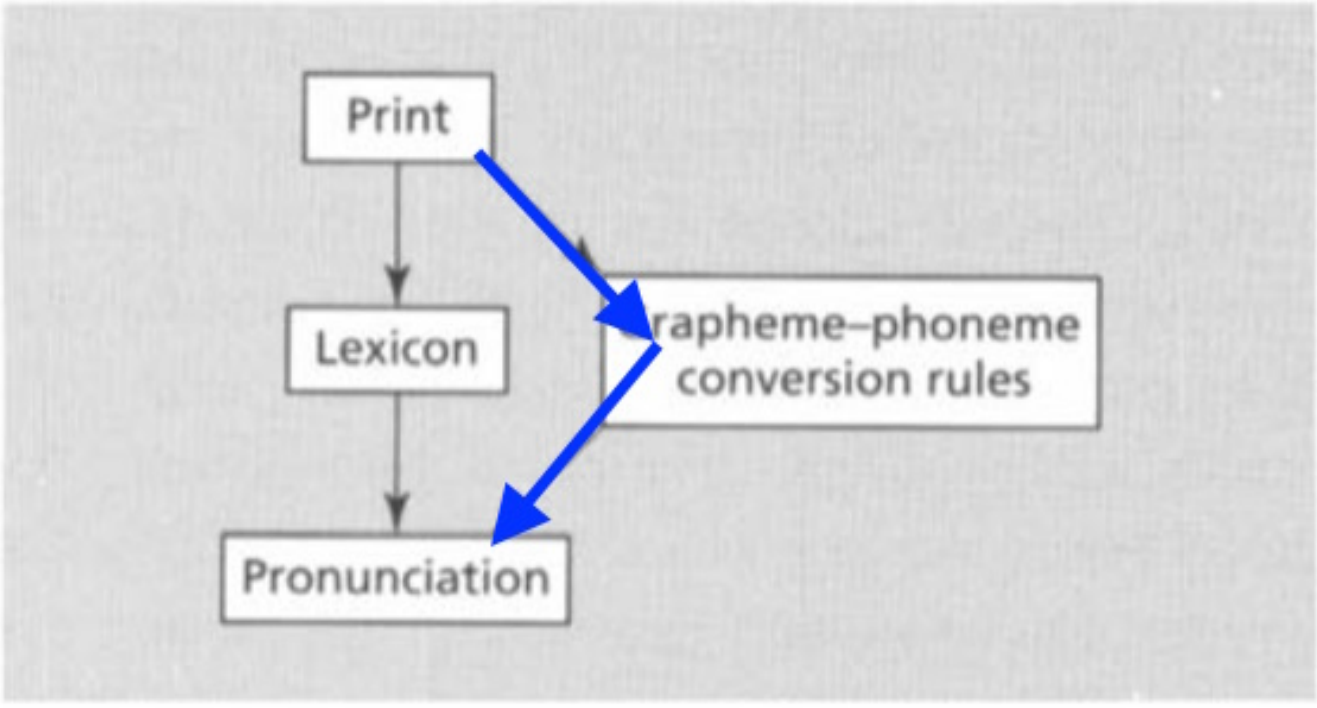
Dual route model of reading



Route 1 – direct access, or lexical, route

- direct link between print and sound

Dual route model of reading

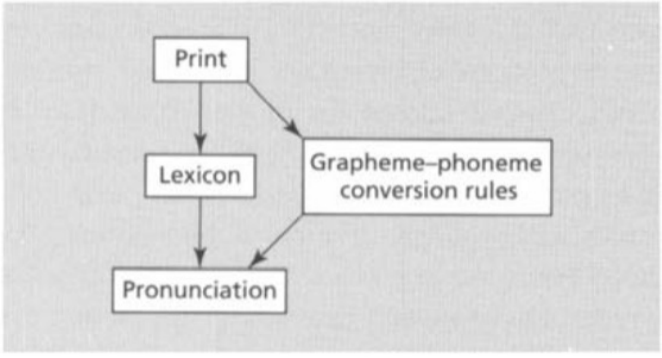


Route 2 – indirect access, or sublexical, route

- grapheme-to-phoneme conversion (GPC)
- phonological recoding

Dual route model of reading

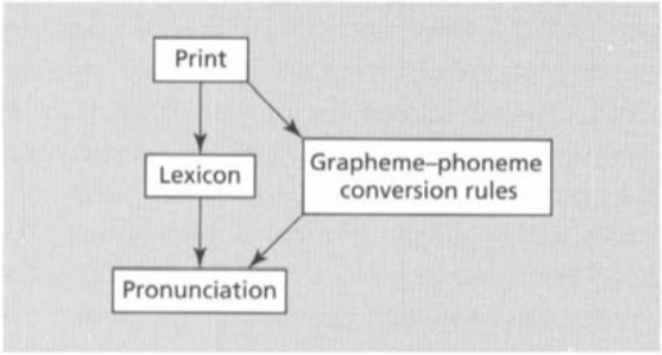
Reading = race between the two routes



- when we see a familiar word, both routes begin processing it
- for skilled readers, the direct route will usually be faster
- hence, we will say the word in the way that is output by direct route

Dual route model of reading

Reading = race between the two routes



- when we see an unfamiliar word, both routes begin processing it
- because it is unfamiliar, direct route will be slow, allowing sublexical route to generate a pronunciation
- both routes will then produce different pronunciations
- this slows down the reading of such words

When reading goes wrong

So far, we have focused on "normal" reading processes. What happens when the processes involved in reading don't work?

dyslexia – general term for a broad class of reading disorders

- acquired versus developmental
- central versus peripheral

Acquired dyslexia

Acquired dyslexia are reading disorders that result from brain trauma (usually left hemisphere)

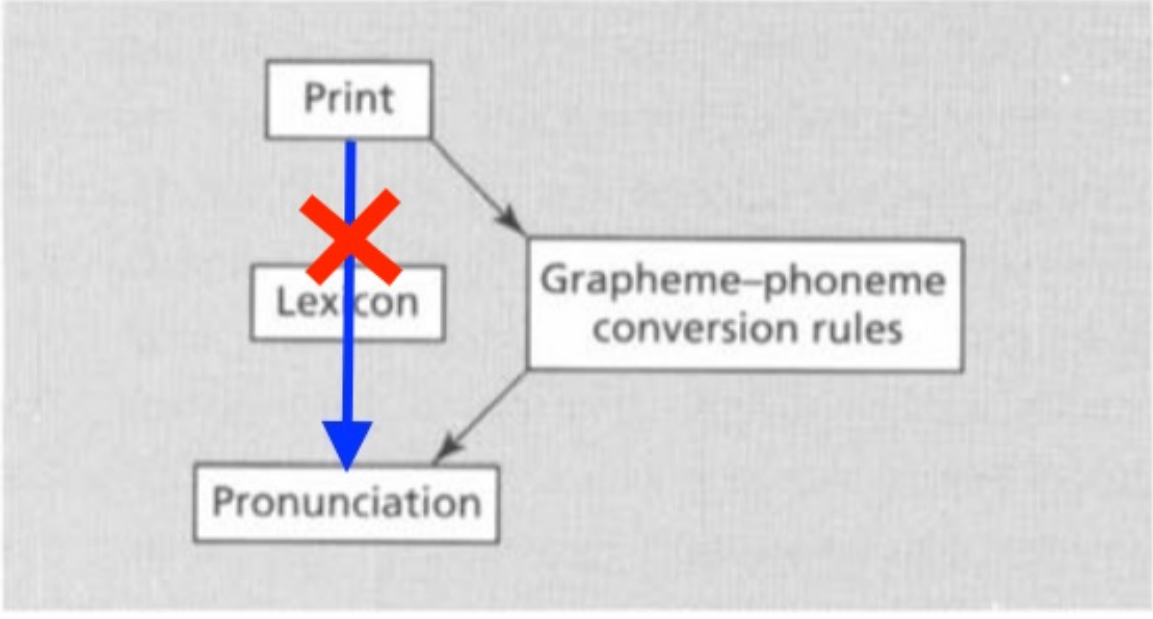
Four types:

- surface dyslexia
- phonological dyslexia
- deep dyslexia
- non-semantic reading

Acquired dyslexia

Surface dyslexia – reduced ability to read irregular/exception words

- normal accuracy in reading regular words
- normal accuracy in reading nonwords
- reduced accuracy in reading irregular words

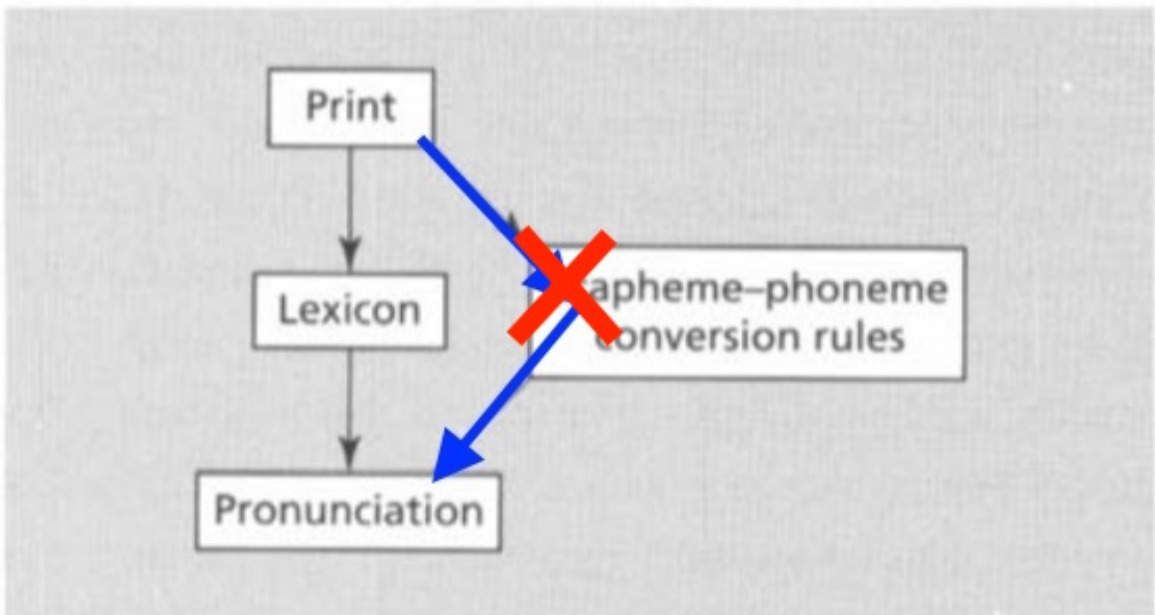


Surface dyslexia = impaired lexical route

Acquired dyslexia

Phonological dyslexia – reduced ability to read pronounceable nonwords (e.g., "pseudowords")

- i.e., cannot read "sleeb", but have no problem reading "sleep"
- normal accuracy in reading regular words
- reduced accuracy in reading nonwords
- normal accuracy in reading irregular words



Phonological dyslexia = impaired sublexical route

Acquired dyslexia

Deep dyslexia – similar to phonological dyslexia, but with an added symptom

Semantic paralexia – when reading, people produce a word semantically related to the target, rather than the target itself!

- DAUGHTER $\rightarrow$ "sister"
- PRAY $\rightarrow$ "chapel"
- ROSE $\rightarrow$ "flower"
- BIRD $\rightarrow$ "canary"

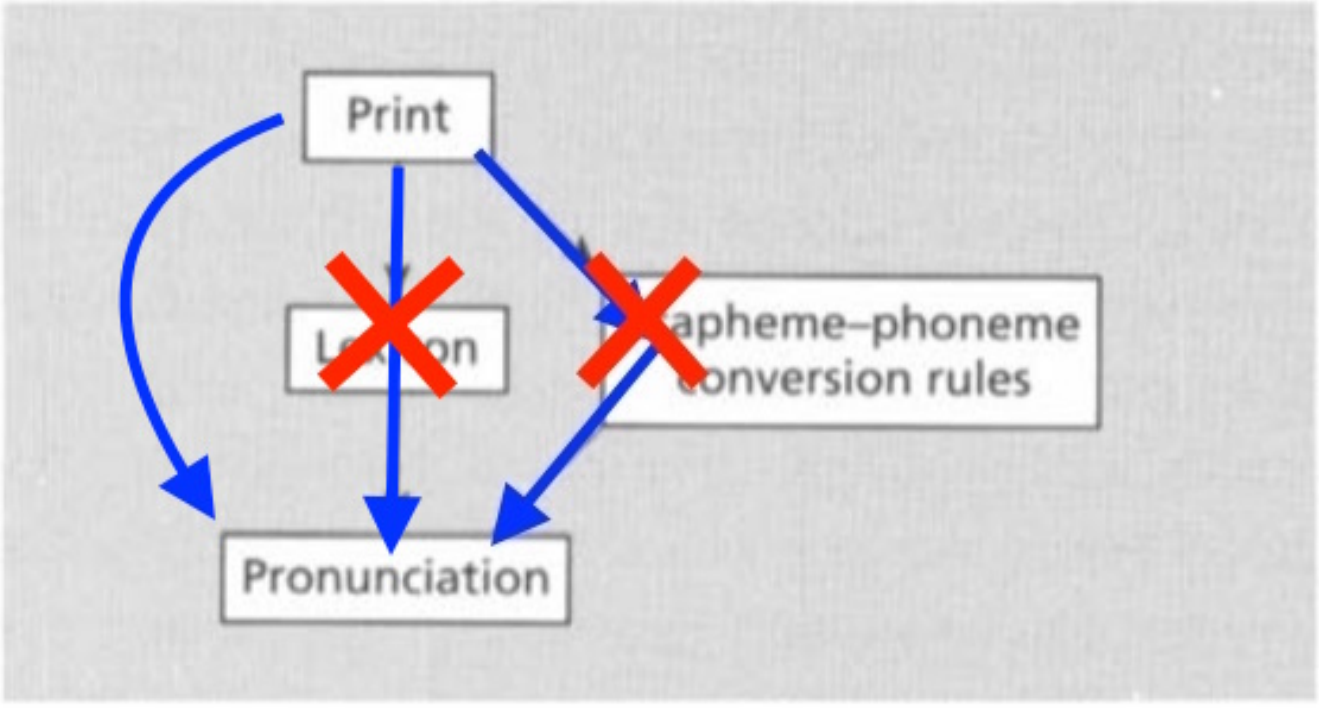
Acquired dyslexia

Non-semantic reading – reading with no understanding of meaning

- Patient WLP (Schwartz et al., 1979) – could read words associated with animal names almost perfectly, but could not match those names to pictures
- Patient WT (Coslett, 1991) – unable to read nonwords (impaired sublexcial route), but could read irregular words just fine (with no understanding)

Acquired dyslexia

Non-semantic reading – reading with no understanding of meaning



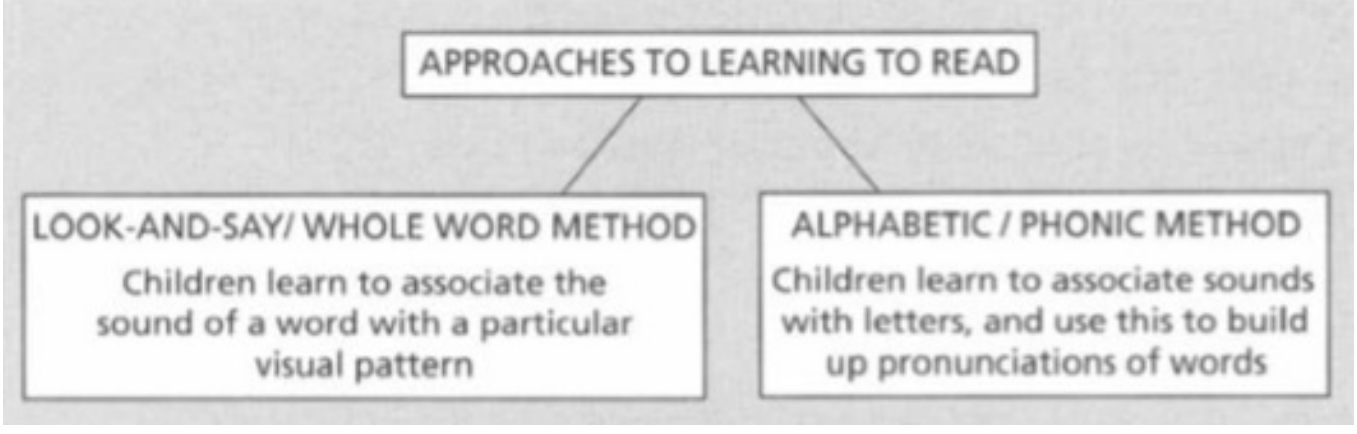
Summary...so far

- Dual route model of reading – two routes from print to pronunciation that race each other
  - lexical route – reading irregular words
  - sublexical route – reading regular words and pronounceable nonwords
- Acquired dyslexias show evidence for independence of these routes
  - Surface dyslexia – impaired lexical route
  - Phonological dyslexia – impaired sublexical route
- Dual route model cannot explain nonsemantic reading!
- revised dual route model – contains direct path from print to pronunciation that bypasses lexicon

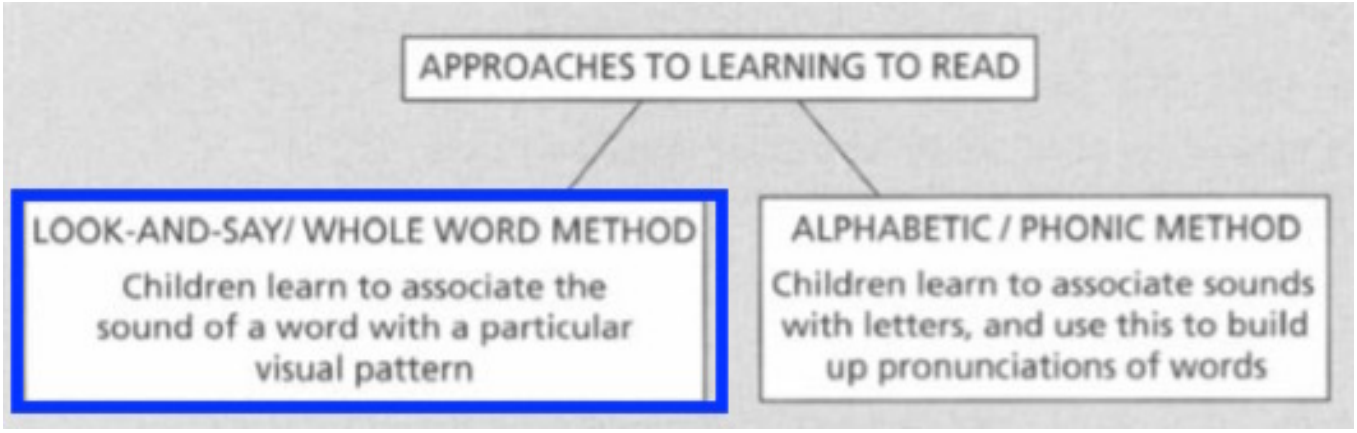
Learning to read

How should reading be taught?

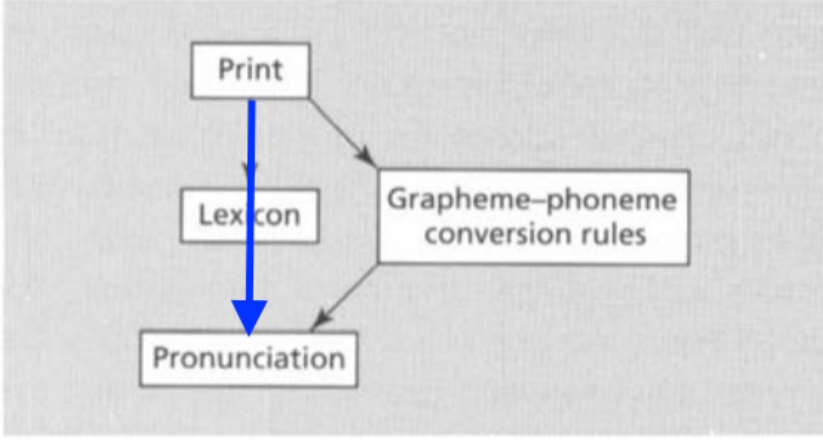
- age seems quite unimportant (Rayner & Pollatsek, 1989)
- older children learn to read more quickly than younger children (Feitelson et al., 1982)
- two popular pedagogical approaches – whole word versus phonics



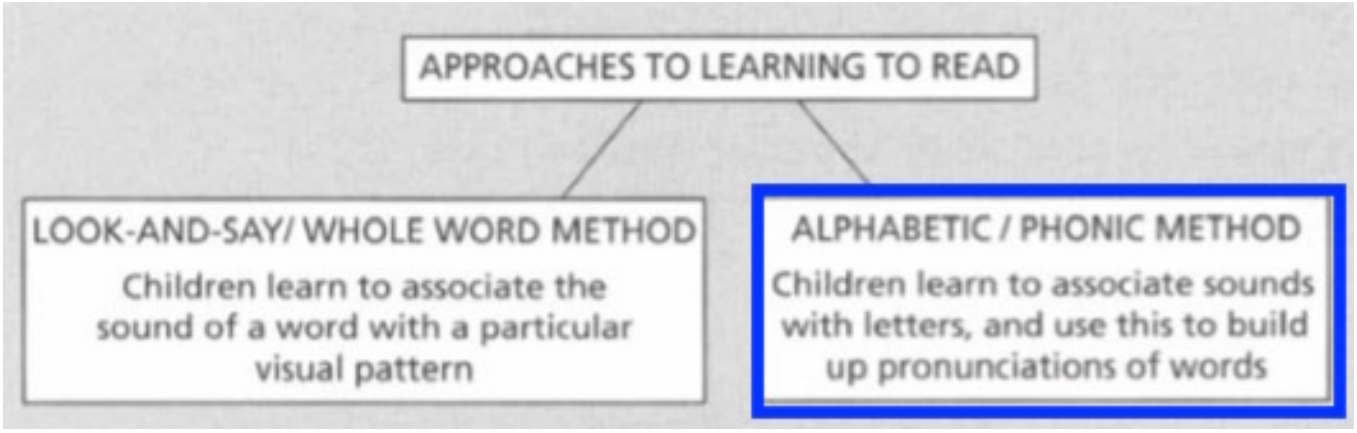
Learning to read



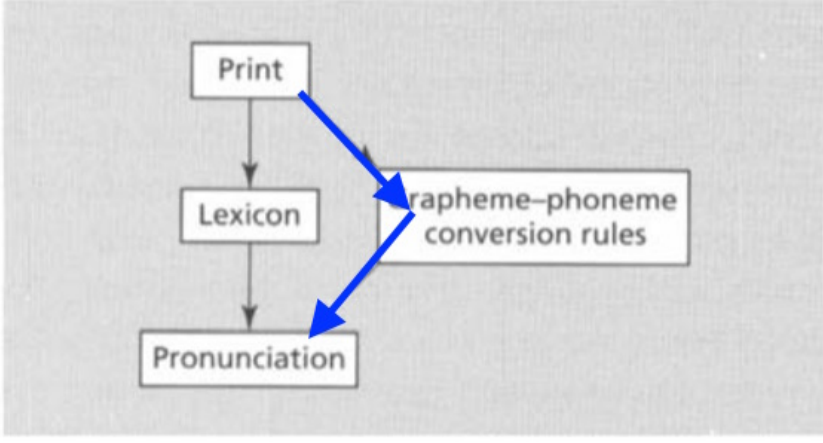
- emphasizes the lexical route



Learning to read



- emphasizes the sublexical route



Learning to read

Which is better: whole word or phonics?

Current research – phonics gives better results (Ehri et al., 2001)

- Seymour & Elder (1986) – when children are taught only to "sight read"
  - read only words they are explicitly taught
  - many reading errors (similar to phonological and deep dyslexia)
- key to reading is when children discover that letters correspond systematically to sounds (Backman, 1983; Byrne, 1998)
- Two types of phonics instruction:
  - analytic phonics – letter sounds introduced gradually after reading has begun
  - synthetic phonics – letter sounds taught before anything else
- analytic phonics more common, but some research shows that synthetic phonics may have advantage (Johnston & Watson, 2005)

Developmental dyslexia

Developmental dyslexia is an impairment in developing reading abilities

- child's reading age must be below what would be expected from age and IQ (Ellis, 1993)
- occurs in 10%-30% of population (Freberg, 2006)
- complex issue – no clear classification of "types" of developmental dyslexia
- developmental dyslexia seems to occur on a continuum between surface dyslexia and phonological dyslexia
- most evidence points to developmental dyslexia = phonological processing deficit

Developmental dyslexia

Interventions?

- explicit training on skills in which person is deficient
  - phonological dyslexia – give training on phonological awareness
  - surface dyslexia – build the orthographic lexicon
- improve memory for spelling patterns