Module 4.4 Orthographic Mapping

Orthographic Memory

- Orthographic memory is the memory for specific, familiar sequences of letters
- Two broad levels to orthographic memory
    - Orthographic recognition is needed for instant and effortless recognition of written words
    - Orthographic recall is needed to produce the correct spellings of words that cannot be reliably spelled phonetically
        - Either irregular spelled words or words with multiple phonetically correct possibilities
    - Orthographic recognition is typically easier than recall-more people can read words like rendezvous, colonel, licorice than can spell them

Establishing Orthographic Memories for Words

- Research
    - David Share's Self-Teaching Hypothesis
    - Linnea Ehri's Orthographic Mapping Theory
    - Various computer models
- Letter sound skills and phonemic skills are central to remembering words, and visual memory plays no measurable role beyond input of words visually
        - Input and storage are not the same

The Self-Teaching Hypothesis

- We teach ourselves most of the 30,000 to 60,000 words we know
    - Orthographic learning occurs one word at a time
    - This only occurs as a result of an encounter with the letters and sounds in the words we have learned-not some form of visual memory
    - Orthographic learning is implicit, rarely with conscious thought
    - From 2nd grade on, we need to see new words only 1 to 4 times for them to become permanently store for future, instant recall
- As student phonically decode words, they are connecting phonemes with graphemes and forming orthographic connection
- Self-teaching occurs efficiently in students skilled with letter and phonemes but does not work well in students who struggle with letters and phonemes
- Orthographic learning requires skilled phonic decoding

Orthographic Mapping

- Mental process used to remember words

    - Self-Teaching hypothesis includes
        - The real world situation in which orthographic learning occurs
        - The central requirement for orthographic learning, which is phonic decoding
    - Orthographic Mapping describes the mental/cognitive connection-forming process that makes words familiar
    - Together, they explain how we build the sight vocabulary and can account for extensive amount of research on reading development
- Orthographic mapping is a mental process, not a teaching technique

Phoneme Skills and Orthographic Mapping

- What is the “mental process” described by Orthographic mapping?
- Words are remembered by connecting pronunciations of oral words to their written counterparts (the words’ spellings)
- This can only happen at the phoneme level, given the phonemic natural of alphabetic writing
- Thus, proficient phonemic abilities are required to efficiently remember words by connecting the phoneme in words to the letter sequences used to spell that word

Flow of Information in Orthographic Mapping

- Phonic decoding goes from text to brain
    - Frome letters to sounds to that word’s pronunciation
- Orthographic mapping goes from the brain to text
    - From the word’s pronunciation to the phonemes in that pronunciation to the letters in that printed word
- A specific letter order (i.e. a written word) becomes familiar when there is a well-established connection with the word’s pronunciation
- Orthographic mapping benefits from phonic decoding
- Orthographic learning = phonic decoding + orthographic mapping

Orthographic Mapping and Phonic Decoding

- In phonic decoding, the written word is unfamiliar
    - Letter-sound knowledge and phonological blending
    - Flow of information is from orthography to phonology
    - Identifying word, not remembering it
- Orthographic mapping only works if the word has been identified
    - Pronunciation of the spoken word then is mapped onto that letter sequence
    - The flow of information is from phonology to orthography, i.e., from the brain to text
    - Orthographic mapping is about remembering a word, not about identifying it
    - This mapping is only efficient at the phoneme/letter level
        - Eventually orthographic patterns get mapped and this assists with the

mapping process
    - Mapping patterns presumes previous phoneme-level mapping of those patterns

Skills Needed for Orthographic Mapping

- Orthographic mapping requires two foundational skills
    - Skilled readers have both of these foundational skills
    - A compromise to these skills results in a compromise in the efficiency with which a reader builds the orthographic lexicon/sight vocabulary
- The two skills needed for efficient orthographic mapping are
    - Letter-sound proficiency
    - Phoneme proficiency

Implications of Knowledge vs. Proficiency

- Many phonological awareness (PA) tests are not sensitive to the phonemic underpinnings of the reading process
    - Phoneme segmentation tests cannot determine segmentation proficiency
        - Only a timed phoneme manipulation test can do that
- The best assessment of the skills needed for orthographic mapping are:
    - Timed nonsense word reading subtests
    - Timed phoneme manipulation tests

What About Irregular Words?

- Both “irregular” and “opaque” words may take longer to learn
- Most irregular words are off by only one letter-sound element
- Irregular words are not a challenge for orthographic mapping

Why Exception Words Are Not an Issue for Mapping

- Many “regular” words require mapping adjustments just like irregular words
    - Silent e words, vowel digraphs, and consonant digraphs are all opaque
    - Multisyllabic “regular” words with vowel reductions require mapping adjustment, much like irregular words
- Irregular words are not the cause of reading problems in English
    - Poor word-level reading is as common in regular orthographies, due to poor orthographic mapping
    - Irregularities make English phonic decoding harder, but do not cause poor sight-word reading
        - Caused by limited sight vocabulary
        - Even regular words are poorly represented in the ot=orthographic lexicons of poor readers