Promoting Fluency by Building the Sight Word Lexicon: Direct Phoneme-Grapheme mapping and other Techniques that Facilitate the Process of Orthographic Mapping

Research interest: building and developing students' orthographic lexicons (sight word vocabularies) so students have a growing number of words they are able to read instantly and effortlessly, to support reading fluency
Focus of project: Improving and remediating fluency in struggling readers by focusing on applying research about how students remember the words they read

Beginning readers must develop the ability to learn to read words from memory accurately and automatically in order to read fluently

- → Many students who struggle with reading fluency receive interventions designed to improve fluency such as repeated readings, partner reading, choral reading, and timed reading
- → However, these interventions appear to be based on assumptions about how readers learn words that do not line up with the scientific findings about how skilled reading develops. For weak readers, repeated visual exposure to words does not substantially close the gap

Two Primary Abilities of Fluent, Skilled Reading (according to David Kilpatrick)

1. Being able to identify unfamiliar words by sounding them out (word *reading*); achieved through phonic decoding, using visual shapes/characteristics, context, guessing
2. Being able to remember previously read words (word *learning)*; achieved simply through recognizing words

Phonics does a great job teaching students how to read words, but it does not do an adequate job of helping students make the leap to learning words so they do not have to do the work of "reading" them anymore – they just know them.

Most reading fluency interventions focus on improving the first skill – identifying words through phonic decoding, visual characteristics, context, or guessing.

- → We need interventions that target word *learning*, which results in fluent reading.
- → Interventions should implement techniques and practices that enable students to increase their number of sight words
- → Sight words – defined by researchers as any word, regular or not, read instantly and accurately
- → Reading fluency is primarily the function of the size of a student's orthographic lexicon (sight word vocabulary), and less related to their ability to decode or identify words through other means.

Reading researcher Linnea Ehri has been studying the process of how words are learned and stored in memory for decades.

- → Phase Theory of Sight Word Learning
- → Unfamiliar words become familiar words
- → Depends on connections children make between sound and spelling
- → Connections that are only partial do not allow fluent reading

Reading researcher David Kilpatrick states that once a reader makes these connection with specific words, they do not forget them

- → If a student forgets words they previously learned, it suggests the words weren't truly learned in the first place because they were not stored for later retrieval
- → It can be argued that fluency is not based on a reader's speed of recall but on whether the words are truly learned/known.

Instructional Implications

Understanding the process of how children turn unfamiliar words into familiar words that are easily and instantly accessed has broad implications for reading instruction and remediation.

- → How do words go from being unfamiliar to instantly recognizable?
- → Linnea Ehri has coined the term "orthographic mapping". The process requires readers to fully analyze sounds in spoken words and to match those sounds to printed words
- → Spelling becomes mapped onto pronunciations and these "mapping connections" serve as the glue to hold these words in memory

Definition of orthographic mapping: The mental process used to store words for immediate, effortless retrieval. It is the mechanism for sight-word learning."

- → Involves the unitization of a sequence of letters to where the word is read instantaneously
- → Not the same thing as memorizing whole words
- → Good orthographic mappers can easily distinguish between visually similar words such as *fathom, father, farther, fatter, farmer*. It is the sequences of letters they pay attention to
- → Orthographic mapping starts with the sound and moves from:
    1. The word's oral pronunciation, to
    2. A segmented representation of the oral word, to
    3. The alphabetic characters that align with that segmented pronunciation.

Print to Speech vs Speech to Print

- → Conventional phonic decoding involves information flowing from letters to sounds
- → Orthographic mapping benefits from this put involves information flowing in the opposite direction

Speech to Print

- → Traditional reading instruction has been print-to-speech
- → Necessary but speech-to-print needs to be taught as well

Involvement of Vision and Hearing in Reading

- → Emphasis on reading as primarily visual activity dominated reading instruction for decades
- → Visual memory is used in learning letters and their sounds
- → Once letters are learned, orthographic memory takes over
- → The brain does not store words based on visual images

The Big Discovery Regarding Orthographic Mapping

- → The oral "filing system" is the foundation we use for reading words
- → There is no separate visual dictionary

→ We input words visually, but we store them phonologically

Orthographic Mapping is critical to reading fluency and comprehension!

What type of instruction facilitates spontaneous orthographic mapping?

1. Students need the knowledge and skills to enable connections between sound and spelling:
   - → Grapheme-phoneme correspondences (letter-sound skills)
   - → Phonemic segmentation
   - → Strategies for reading unfamiliar words
2. Students need to practice specific skills when reading and spelling words, such as:
   - → Decoding/pronouncing unfamiliar words when reading independently
   - → Segmenting phonemes in words and matching them to spellings
   - → Practicing segmenting, pronouncing and writing syllables
   - → Practicing spelling words through oral or written exercises
   - → Practicing reading minimal pairs of words that are close in spelling to target words

Applied Research in the Use of Phoneme-Grapheme Mapping & Word Analysis

Gaskins & colleagues (1996/1997)

- → Intervention with 1st graders having trouble remembering key words to use as analogies to new words with the same pattern
- → Researchers noted students were not paying attention to all the letters in each word they read
- → Used the process of explicit phoneme-grapheme mapping
- → Students became word detectives; learned to analyze and talk about words to create fully-represented words in their memory

McCandliss & colleagues (2003)

- → Word Building Intervention aimed to move students from partial-alphabetic phase of sight word reading to full alphabetic phase
- → Students were accurately decoding graphemes in word initial positions but not in other word positions
- → Researchers sought to direct children's attention to each grapheme position within a word through a technique called "progressive minimal contrasts" (word chaining)
- → Gains were made in decoding, phonemic awareness and passage comprehension
- → Researchers concluded this activity was well suited to encourage children to approach word reading in the full alphabetic phase

Bhattacharya & Ehri (2004)

- → Researchers sought to help struggling adolescent readers who used strategies focusing only on partial syllables
- → Hypothesis: readers trained to recognize syllables would fully analyze words and move from full alphabetic phase to consolidated phase of sight word reading
- → Second hypothesis: readers trained to recognize syllables would be able to transfer these skills to unpracticed words and nonsense words
- → Experimental group received grapho-syllabic training; control group received training in reading words as whole units

→ Grapho-syllabic training taught flexible syllabication rules, focusing on teaching students to form complete grapho-syllabic connections between spellings and pronunciations
→ Syllable training enhanced readers syllable analysis skills, especially for the weakest readers
→ Also improved readers' memory for word spellings and ability to build sight word vocabularies

My Own Use of Orthographic Mapping Techniques

→ Phoneme-grapheme mapping on mapping paper. Involves hearing the word, tapping the sounds, viewing the spelling of the word, matching letters to sounds in the correct order in sound boxes.
→ Older students also analyze syllables and identify one vowel sound for each syllable
→ "Sight word" worksheet: enables students to fully analyze a word's internal structure by identifying number of letters, consonants, vowels, syllables; requiring students to "tap and map" the sounds; identify one vowel for each syllable; and "play" with the word through finding words inside the word and writing the word's spelling backwards
→ Followed by application of skills by reading words in connected text

Resources:

David Kilpatrick's Essentials of Assessing, Preventing and Overcoming Reading Difficulties (2015)
David Kilpatrick's Equipped for Reading Success (2016)
David Kilpatrick's Reading Development and Difficulties: Bridging the Gap Between Research And Practice (2019) – includes a chapter by Linnea Ehri
Kathryn Grace's Phonics & Spelling Through Phoneme-Grapheme Mapping (2005) – includes a plan for classroom or small group weekly phoneme-grapheme mapping lessons
Spell Links to Reading and Writing Word Study Curriculum – a speech-to-print based curriculum that can be used with whole classroom ("Class Links") or small group or one-on-one
Spell Talk ListServ: https://mailman.listserve.com/listmanager/listinfo/spelltalk

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