Understanding the Role of Phonemic Proficiency in Boosting Reading Skills in Struggling Readers

Wisconsin State Reading Conference
February 6, 2020

David A. Kilpatrick, PhD
State University of New York College at Cortland

Today's Objectives are to learn about and understand . . .

1. Common misunderstandings regarding phonemic awareness
2. The two levels of word reading
3. The three types of learning required for word-level reading
4. How we remember the words we read
5. The *phonemic proficiency* hypothesis
6. The difference between phoneme TASKS and SKILLS
7. The Phonological Awareness Screening Test

Common Misunderstandings About Phonemic Awareness and Reading

Common Misunderstandings

- PA is not important after first grade
- Thought to only relate to early learning of CVC words
- Not thought to be involved in sight word acquisition
- PA cannot be learned after second (or whatever) grade
- PA is best taught using letters
  - A common misunderstanding of the National Reading Panel's findings
- PA is simply a by-product of reading, not a cause

The Two Levels of Skilled Word Reading

Two Levels of Word-level Reading

1) **The ability to sound out unfamiliar words**
   - Based primarily on letter-sound skills & phonemic blending
   - Also aided by knowledge of:
     1) Phonically regular patterns (e.g., classic rules or syllable types)
     2) Set for variability
     3) Context, specifically for
        - Irregular words (*of, one, said, iron, yacht*)
        - Non-homophonic homographic words (*dove/dove, lead/lead, present/present*)
        - Multisyllabic words (to help with syllable stress and syllables with vowel reduction)
          - (NVR but stress?: *inform vs. instant;* VR and stress: *envelope, vanilla*
2) **The ability to remember words**
   - Instant, *effortless* recognition
   - Unrelated to visual memory
   - Words are remembered via orthographic learning
   - Based on phonemic analysis skills and letter-sound skills

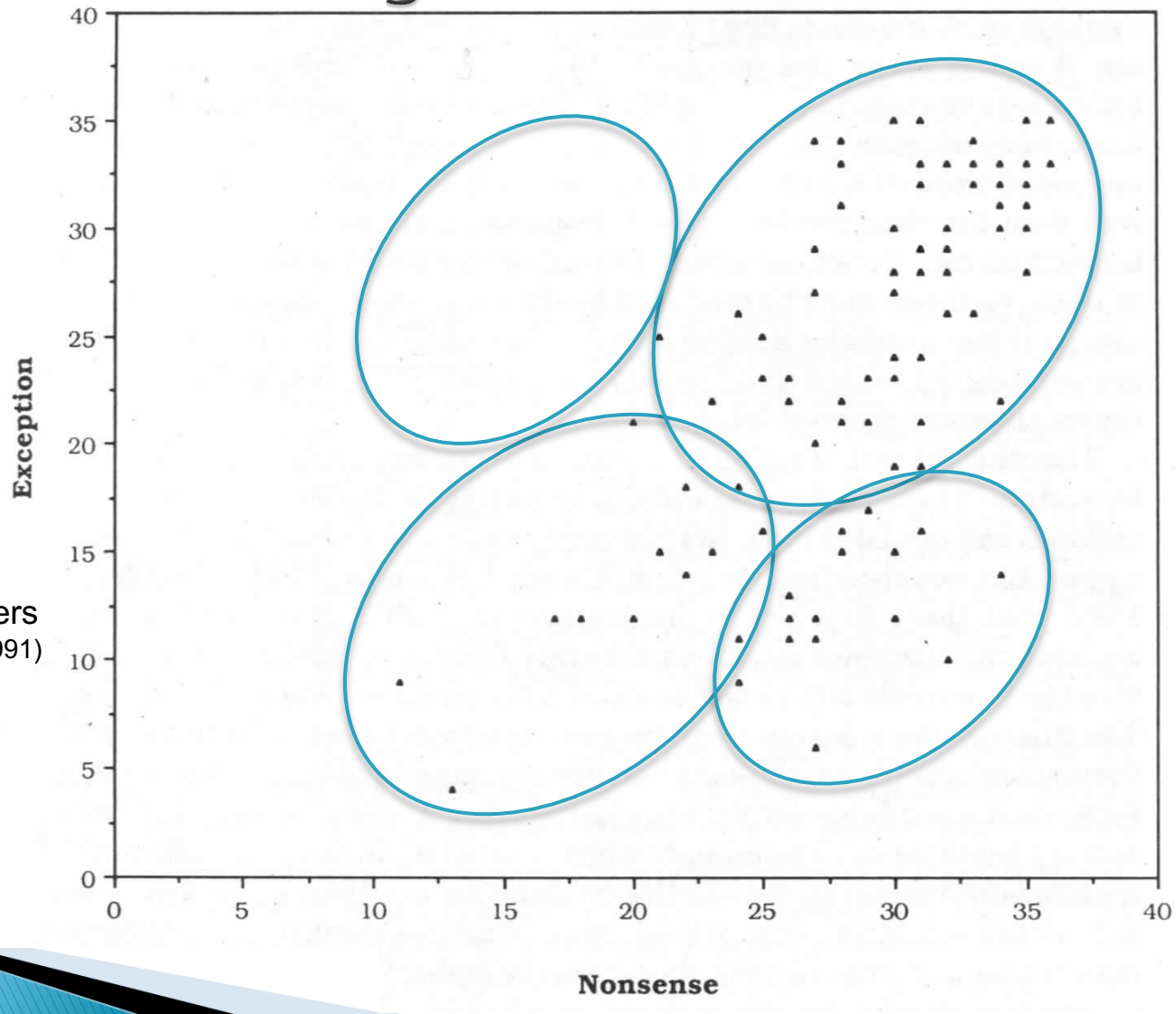
Word Reading Level 1: Accurately Sounding Out Unfamiliar Words

- All skilled readers of alphabetic writing systems *learn* this skill, whether we *teach* them or not
- Most weak readers do not naturally develop this skill
- Phonics instruction can reliably develop this skill if a student has sufficient basic phonological skills
- Promotes word memory in typical readers (Share's theory of orthographic learning) but not weak readers
- The term "phonics" is a lightening rod for controversy, yet phonics skills are required for skilled reading

Word Reading Level 2: The Ability to *Efficiently* Remember Words

- Requires Level 1: Skill at sounding out new words
  - David Share's self-teaching hypothesis
- Letter-sound skills and phonemic analysis skills are also central
- Not addressed by any current reading approaches
  - Exposure only produces word memory for those already skilled in orthographic learning
- Weak readers may become competent at Level 1 (sounding out words), but virtually *never* at Level 2 (efficiently remembering words) unless the source of the problem is addressed
  - Don't believe me? Go to www.thepasttest.com and learn that free test and give it to weak readers

Two Levels of Word-Level Reading Skill Deficits



Study of 93
1st through 3rd graders
From Gough & Walsh (1991)

Skilled Word Reading Requires Three Types of Learning

Three Types of Learning Required for Word-Level Reading

1) Paired-Associate Learning (PAL)
2) Statistical Learning
3) Orthographic Mapping

- These are typically not distinguished from one another by teachers or researchers
- Each plays a different role in word-level reading acquisition
- Not acknowledging these different learning processes can negatively affect assessment and instruction

Paired-Associate Learning (PAL)

- Involves associating two things so that the presence of one activates the other
  - Language/labeling involves verbal PAL
- Foundational for learning letter names and sounds
  - Letter learning involves visual-phonological PAL
  - The visual half of that equation is not the problem
- *Not* the basis for written word learning
  - Yet many teaching methods seem to presume this
- Learning is explicit (i.e., conscious learning)
- Dozens to hundreds of exposures needed for accuracy-based *mastery*, hundreds to thousands for *automaticity*

Statistical Learning

- Involves deriving patterns from multiple incidences
- Statistical learning is generally implicit learning
- Skilled readers who were never taught common phonic rules or syllable types learn them anyway via statistical learning
  - (e.g., *vo* vs. *vop* vs. *vope* vs. *voap vs. vor*)
  - Other orthographic patterns learned this way
  - Source for build up of general orthographic knowledge
- Unclear how many learning "trials" are needed
  - It may vary depending on specific types of patterns
- Poor readers do not display efficient statistical learning when it comes to reading
- Statistical learning is currently a "hot" area of study

Orthographic Mapping

- The cognitive memory *process* involved in remembering words for later, instant and effortless retrieval
  - Also applies to word parts, not just words
- Orthographic mapping is the mechanism that builds the sight vocabulary/orthographic lexicon
- The process is implicit
- New learning requires only 1–4 exposures
  - Thus it is *much* faster than PAL or statistical learning
- Differs significantly from from statistical learning
  - Orthographic mapping involves connections between *specific* pronunciations and *specific* letter strings (i.e., written words)
  - Statistical learning *generalizes* patterns from multiple instances

Three Types of Learning Required for Word-Level Reading

Type of Learning	Role in Word Reading	Effort	Domain	Speed of acquisition	Skills Required
Paired-Associate Learning	Letter Names & Sounds	Conscious	Specific to specific	Dozens to hundreds or even thousands of exposures	Visual discrimination & memory phonological memory
Statistical Learning	Deriving common patterns-supports phonic decoding	Implicit	Generalize from specific examples	Unknown-likely dozens to hundreds of exposures (may vary by pattern type	Currently under study
Orthographic Mapping	Remembering specific words and word parts	Implicit	Specific to specific	1-4 exposures	Letter-Sound proficiency Phonemic proficiency

Confusion Due to Not Knowing About the Three Types of Learning

- Normal/efficient remembering of written *words* is not via PAL
  - Flash cards are great for letters and digraphs (and math facts, etc.)
  - Once the letter-sound skills are mastered, neither phonic decoding nor orthographic learning are based on PAL
  - Whole word memorization via flash cards treats orthographic learning (1-4 exposures) like it is PAL learning (dozens to hundreds of exposures)
  - But there is a very effective way to use flash cards for words (later slide)
- Deriving patterns via statistical learning is no substitute for orthographic learning
  - Statistical learning primarily helps with phonic decoding
  - Children can/should be taught the common patterns
  - Irregular words by their nature break these patterns
  - All regular and irregular words are specifically mapped

How We Remember the Words We Read

Recall the Alphabetic Principle

- Alphabetic writing is phonemic writing
- English has the most irregular alphabetic writing system
- Yet *cat, sat*, and *hat* would never be spelled *rqz, mwr, byl*
- Some say English is not phonemic, but morpho–phonemic
  - But the elements of morphology are comprised of letters representing phonemes
  - Morphologically related changes in pronunciation affect phonic decoding, not orthographic mapping

Recall that Sight Word Vocabulary is NOT Based on Visual Memory/Visual Skills

- Previously we heard about several lines of evidence against the "visual memory hypothesis"
- We have poor visual memory anyway—it is not up to the task
  - We seem to have "specialized circuitry" for face memory (right fusiform gyrus) and orthographic memory (left fusiform gyrus)
- Words are learned via "orthographic memory"
- There are two levels of orthographic memory
  - Recognition (reading)
  - Recall (spelling)
- Words get anchored in orthographic memory via a phoneme to grapheme mapping process, i.e., orthographic mapping

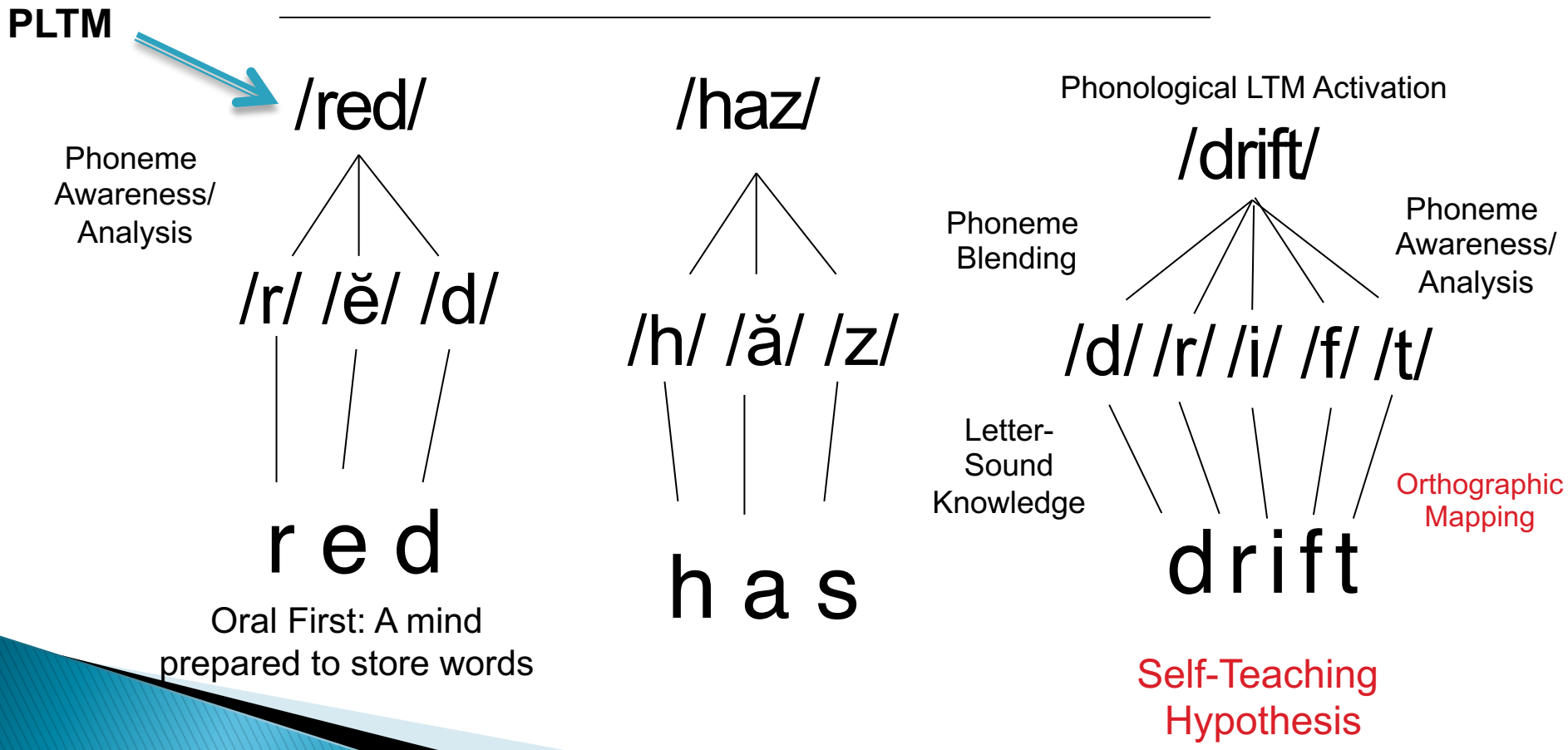
Share's & Ehri's Orthographic Learning Theories

- Visual memory does not play a big role
- Letter-sound skills play a big role
- Phonemic skills play a big role
- Orthographic learning is implicit – typically does not involve conscious thought or effort

How We "Map" Words

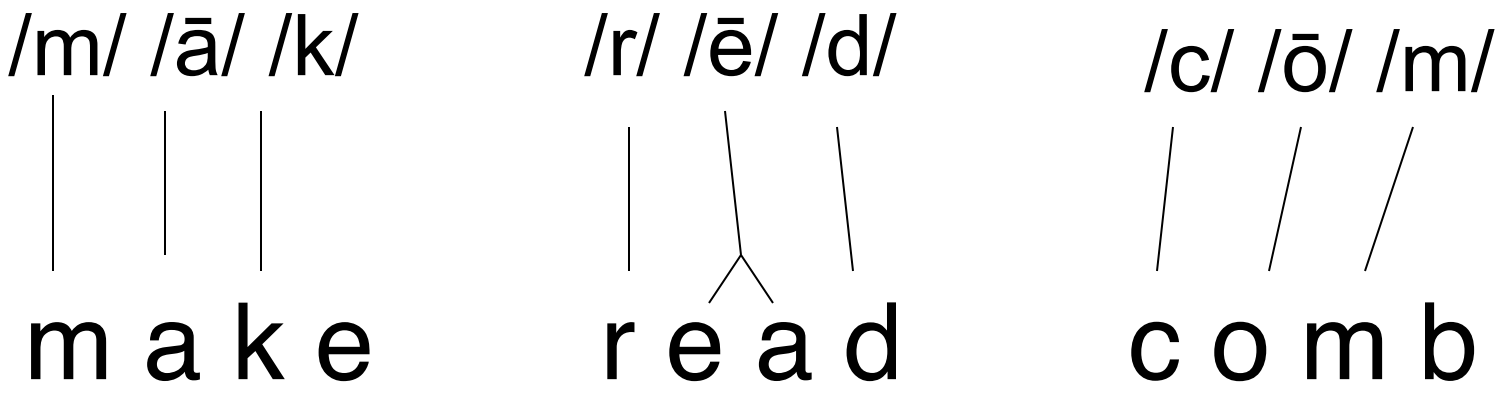
"Transparent" Words

(i.e. words with one-to-one correspondence)



How We "Map" Words

Words that are "Opaque"
(i.e. words without a one-to-one correspondence)



What about irregular words?

- Irregular and opaque words take longer to learn
  - Only 1-2 extra exposures for typical readers; many more for RD
- Most irregular words are off by only one element
  - (*said, put, comb, island*; multiple violations are rare: *one, iron*)
- Irregular words not a challenge for orthographic mapping
  - "Exception words are only exceptional when someone tries to read them by applying a [phonic] decoding strategy. When they are learned as sight words, they are secured in memory by the same connections as regularly spelled words . . ." (Ehri, 2005 p. 171-172)

Let's Review the Skills Required for Efficient Orthographic Memory

A key question that requires a scientific response

Of all the words you know . . .

- **Letter-sound proficiency**
- **Phonemic proficiency**
  - This goes well beyond what is tested on universal screeners
- The ability to establish a relationship between sounds and letters unconsciously while reading

Effective Use of Flash Cards
From the Perspective of Orthographic Mapping

- Introduce the word orally first
- Segment into phonemes verbally (no letters)
- Emphasize each phoneme
- Ask for letters associated with phonemes
- Build a "phonological framework"
  - Focus first on regular letter-sound connections
- Elaborate if possible
- Then work that word into a stack of flash cards

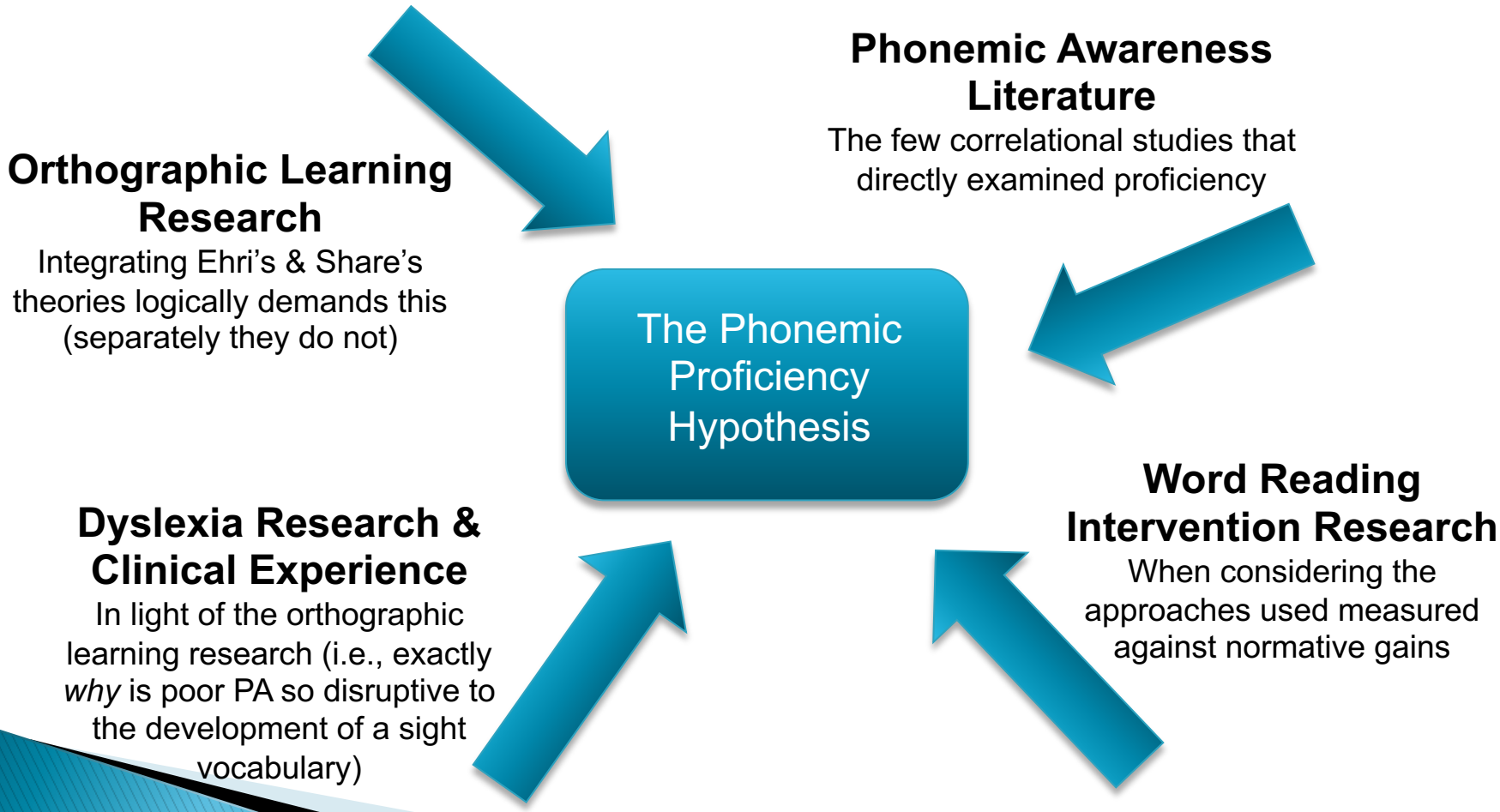
The Phonemic Proficiency Hypothesis

of Orthographic Learning

The Origin of the Phonemic Proficiency Hypothesis

- 1997 to October 2001 PA assessment with McInnis' *Phonological Processing Assessment*, based upon Rosner & Simon's 1974 *Auditory Analysis Test*
- 4th, 5th, and 6th grade poor readers
- October 2001 screened a third grade class

Current Evidence for The Phonemic Proficiency Hypothesis



Research Support for Phonemic Proficiency and Sight-Word Learning

- Vaessen & Blomert (2010)
  - 1400 students, grades 1-6, over 200 at each grade
  - Phonemic manipulation – accuracy and timing
  - High frequency words and low frequency words
    - Low frequency words estimate size of sight vocabulary
  - PA accuracy and high frequency words, correlations dropped off quickly
  - PA timing showed steep continued growth 1-5
  - PA timing and sight vocabulary correlated .5 or higher right up to 6th grade
- Other studies with hundreds of children showed timing provides a better index of the phonemic skills underlying reading

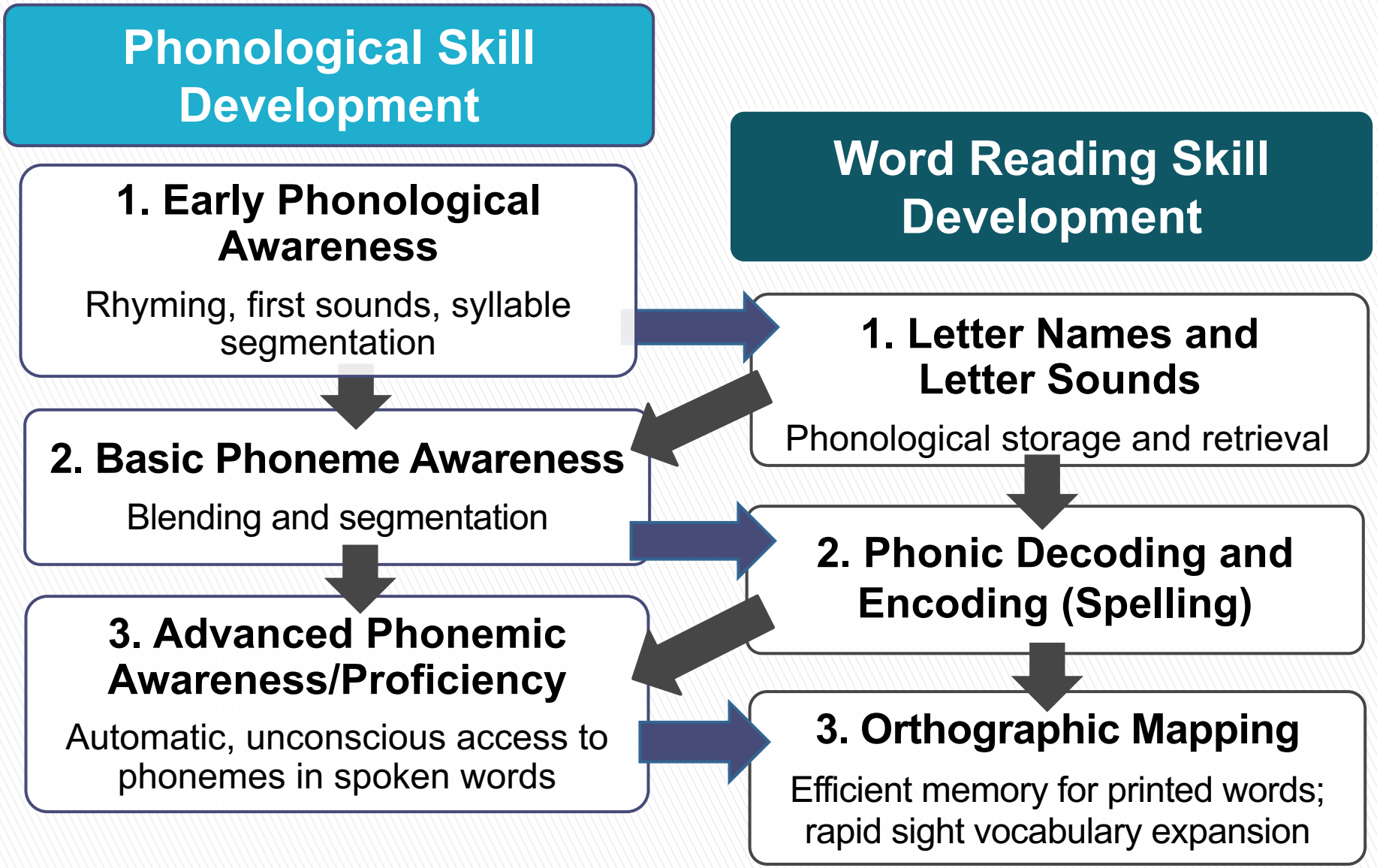
Research Support for Phonemic Proficiency and Sight-Word Learning

- Studies I've done
- 132 1st graders
  - Phonemic manipulation – accuracy and timing
  - TOWRE-2 Sight Word Efficiency
  - Instant responses to PA and SWE = +.58
  - Accurate, non-instant responses = +.004
- 60 5th graders
  - Instant responses to PA and SWE also = +.58
  - Accurate, non-instant responses = -.25
- Similar result with high school students
  - Nearly identical to 5th grade results

Other Studies

- Kindergarten students ($n = 72$) in the fall of K
  - Could not sound out simple nonsense words (out of a large pool of K students)
  - Taught 10 words in class, 6 were embedded in TOWRE
  - Instant responses to syllable and O-R task predicted words learned, non-instant responses did not
- Grade 1 students ($n = 62$) in the fall
  - Timed PA (O-R and basic phoneme level), WRMT-R Word ID & Word Attack
  - Instant PA responses correlated with Word ID, non-instant did not
  - Instant PA responses accounted for sig. variance controlling for Word Attack
- Grade 2 and 3 students ($n = 34$) in the fall
  - Timed PA, WRMT-R Word ID & Word Attack & timed exception word test
  - Instant PA responses correlated with all of these, non-instant with none
  - Instant PA responses accounted for sig. variance in timed exception words after controlling for RAN

The Developmental Relationship Between Phonological Skills and Word-Level Reading



Phonemic *Tasks* vs. Phonemic *Skills*

Phonemic TASKS vs. Phoneme SKILLS

- We need to move from a *task* mentality to a *skill* mentality
- Two types of phoneme tasks: *synthesis* and *analysis*
  - *Synthesis* goes from part to whole (e.g., blending)
  - *Analysis* goes from part to whole (e.g., segmenting)
- There are many phoneme *tasks* but only two *skills* are needed for reading
- Synthesis and analysis play different roles in reading:
  - Phoneme blending is needed for phonic decoding
  - Phoneme analysis is needed for remembering words

National Reading Panel (2000) on the role of Phonemic Skills in Word Reading

(From Section 2 page 32)

Phonemic Synthesis:

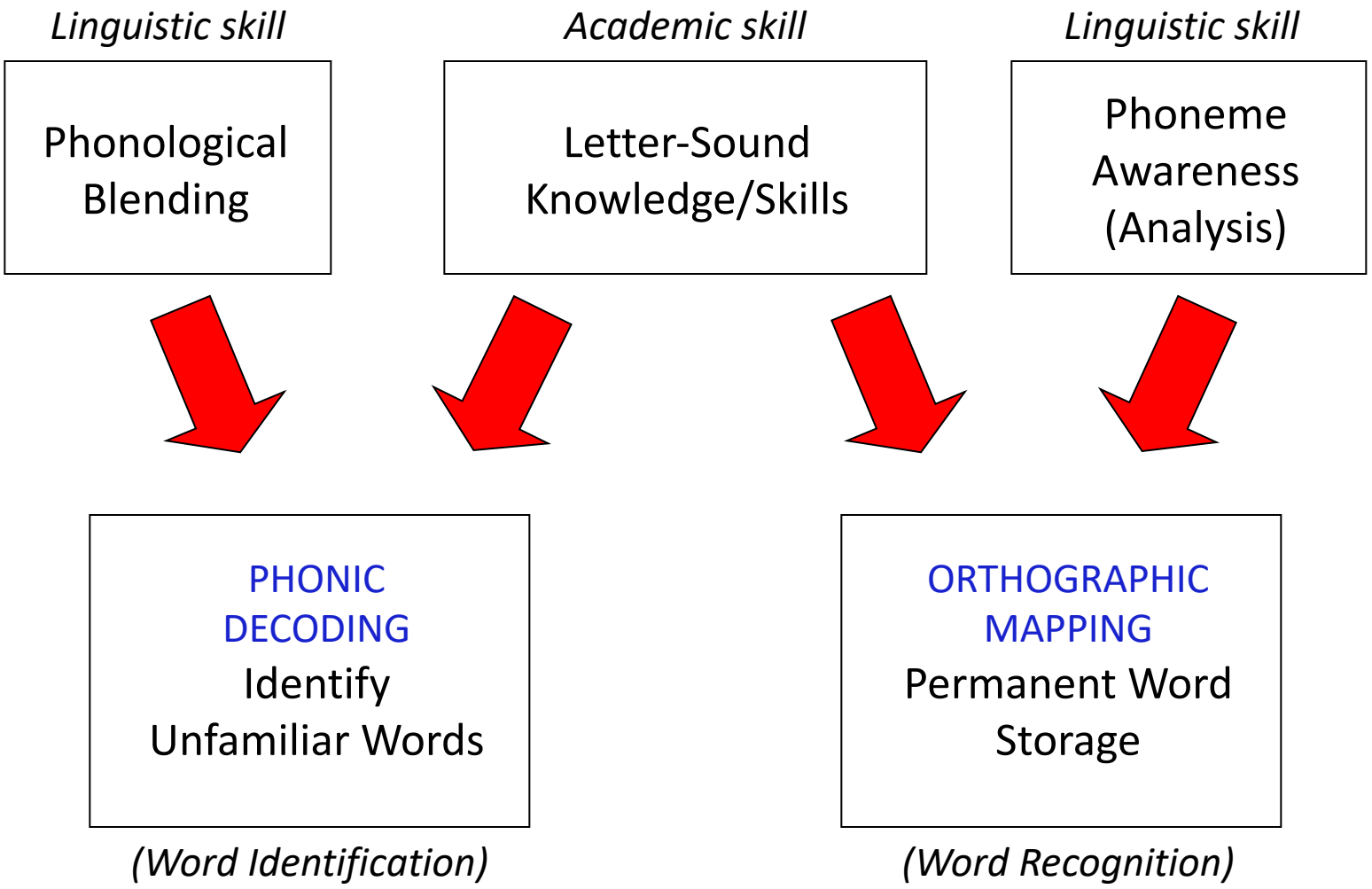
"The skill of blending is needed to decode unfamiliar words."

Phonemic Analysis:

"Phonemic segmentation* helps children *remember* how to read and spell words . . ." (emphasis added)

*Refers to a phonemic analysis *skill,* not a segmentation assessment *task*

(Phoneme segmentation tasks are not as sensitive to the phonemic skills needed in reading as other phonemic tasks like phoneme deletion or substitution)


Linguistic skill
Academic skill
Linguistic skill
Phonological Blending
Letter-Sound Knowledge/Skills
Phoneme Awareness (Analysis)
PHONIC DECODING
Identify Unfamiliar Words
ORTHOGRAPHIC MAPPING
Permanent Word Storage
(Word Identification)
(Word Recognition)

The Phonological Awareness Screening Test

(PAST)

The PAST Assessment

- Phonological Awareness Screening Test (PAST)
  - Acronym has double meaning
- Based on Rosner & Simon (1971)
  - Reworked and improved by McInnis
  - It is “third generation Rosner”
  - *CTOPP* Elision is “first cousin once removed”
- Outstanding correlation with reading
  - .6 to .8 elementary students; .5 adults

The PAST Assessment www.thepasttest.com

- Not to be confused with another online test with the same acronym
  - "Phonological awareness Skills Test"
- Based on phonological manipulation
  - Uses segmentation, isolation, & blending
- Assesses the automaticity of PA
- Multiple versions for progress assessment
- Great supplement for *CTOPP*
- Requires some training
- Instructions available on website
- Free to use
- Not normed – criterion based

Summary

Summary

- Many misunderstanding about PA float about
- Word reading involves two levels
  - Identifying new words and remembering words
- Word reading requires three different types of learning
  - Paired-associate learning, statistical learning, and orthographic learning
- We remember words via orthographic learning
  - Requires letter-sound proficiency and phonemic proficiency
- The phonemic proficiency hypothesis is well supported
- Phoneme tasks do not necessarily = phoneme skills
- The PAST assesses phonemic proficiency
  - But keep your eyes open for the WIAT-IV in 2020!