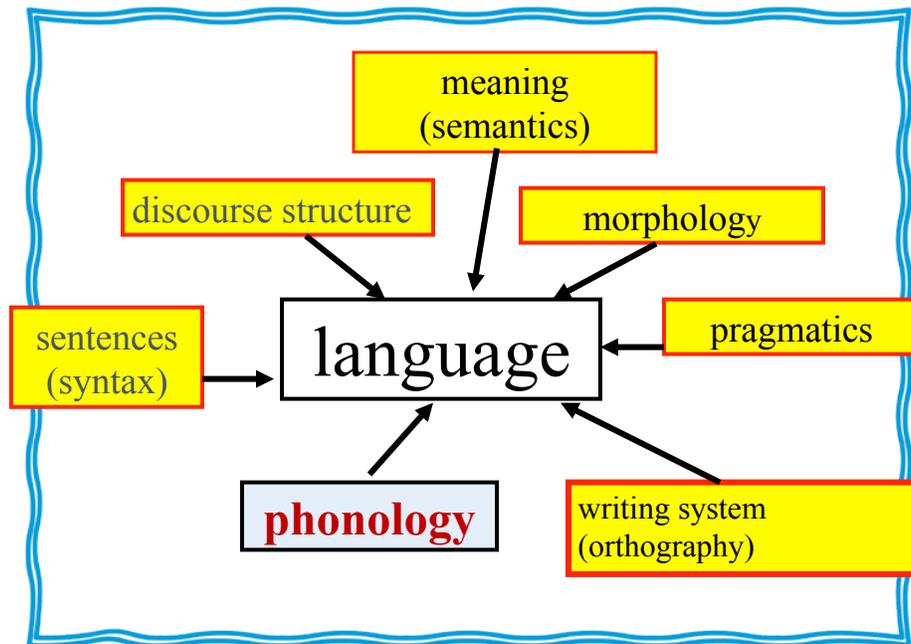


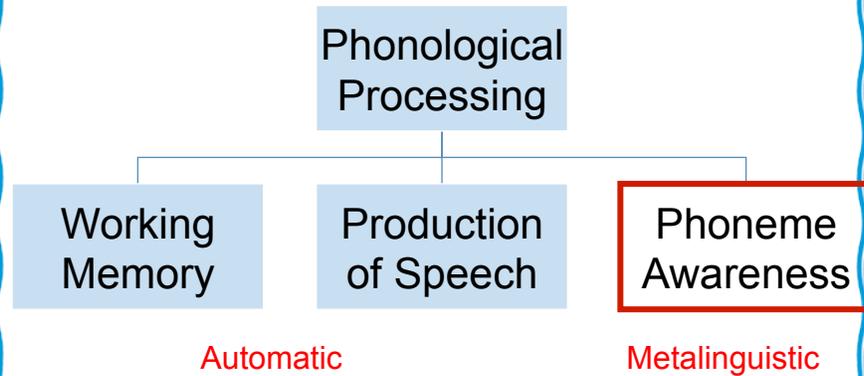
Phonology Revisited: Sorting Out the “PH” Factors in Reading and Spelling Development

Indiana, November, 2015

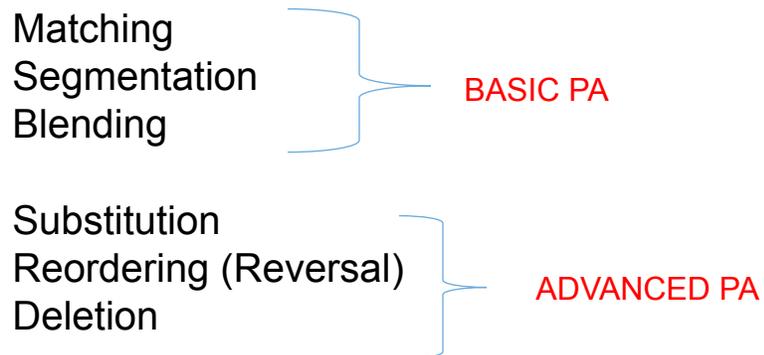
Louisa C. Moats, Ed.D.
(louisa.moats@gmail.com)



Phoneme awareness predicts reading and spelling between K and later grades.



Typical PA Tasks



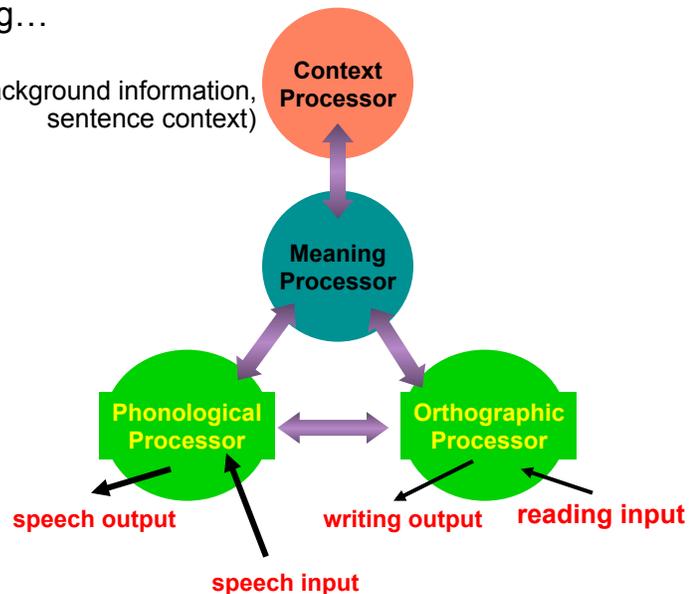
Direct Teaching of Phoneme Awareness Has Long-Term Benefits

Gains from training in phonological awareness in kindergarten predict reading comprehension in Grade 9.

Kjeldsen, Niemi, Olofsson, & Witting (2014),
Scientific Studies of Reading, 18:452-467.

Four Major Brain Systems Recruited for Reading...

(background information, sentence context)



Phonemes held in working memory create mental “parking spots” for graphemes.

/b/ /ē/ /ch/ /ə/ /z/

b ea ch e s

/sh/ /ā/ /p/

sh a p e

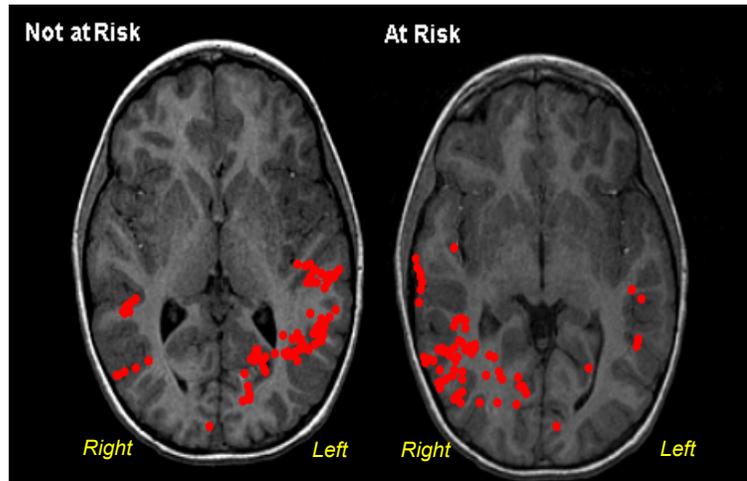
Student In Mid-1st Grade

Lesson Number 2 Subject Number 3

My teacher
DETROIT cat
DISSTERTORR
EDERKREITOCK
KDERKREKRRER
KOC RDEK
OOFEERF

He was writing aimlessly or making up what it said

5 Year Olds Before Learning To Read



Why Is Phoneme Awareness Challenging for Novice Learners?

“Children faced with the task of learning to read in an alphabetic script cannot be assumed to understand that letters represent phonemes because awareness of the phoneme as a linguistic object is not part of their easily accessible mental calculus, and because its existence is obscured by the physical properties of the speech stream.”

(A. Liberman, 1989, Haskins Laboratories of Yale University)

A Phoneme is a Mouth Gesture

Consonant sounds are closed speech sounds.
What is your mouth doing as you say each of these sounds?

/p/ (pop) /t/ (tip) /k/ (back)
/b/ (bob) /d/ (dip) /g/ (bag)
/m/ (mob) /n/ (nip) /ng/ (bang)

Allophonic Variation: Which is the best keyword to associate with each phoneme?

short e, /ĕ/ --- egg; elephant; engine; Ed; echo

short I, /ĭ/ --- igloo, Indian, itch

consonant /d/ --- desk, dress

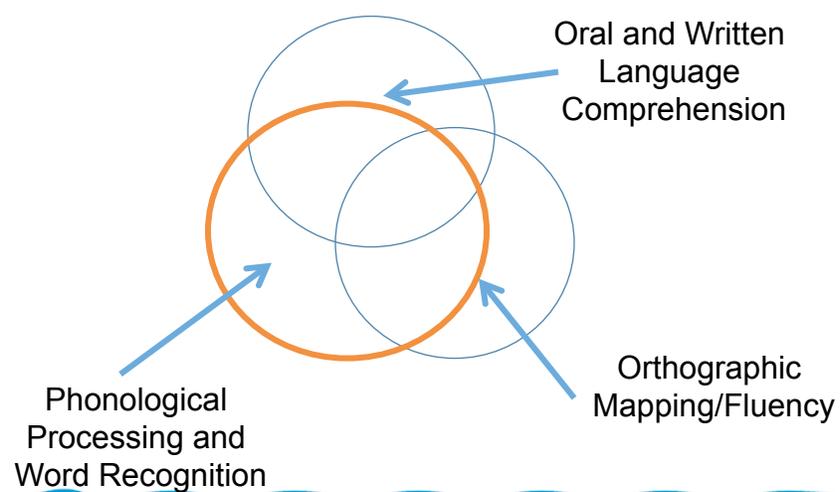
consonant /t/ --- table, train, twin

CAVEAT! Phonological Deficits Characterize MANY But Not ALL Students with RD

- Some students do well on phonological processing tests but still can't read or spell words proficiently
- Some students do well on phonological processing tests but have specific problems with reading comprehension
- Some students learn to read and spell in spite of poor performance on phonological processing measures (e.g., the C-TOPP)

Elliott & Grigorenko, *The Dyslexia Debate*, 2014

Subtypes of Reading Difficulty

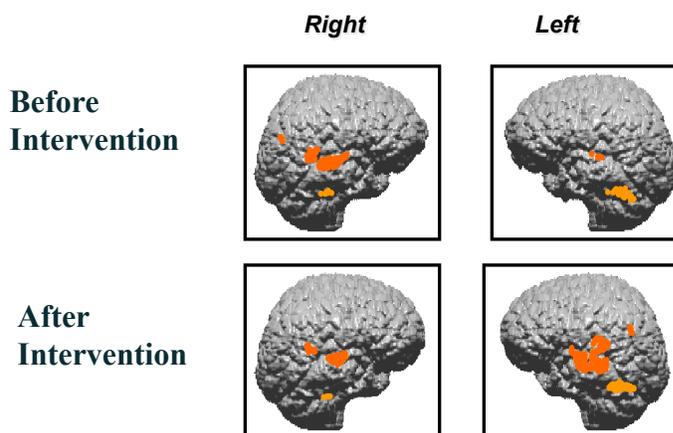


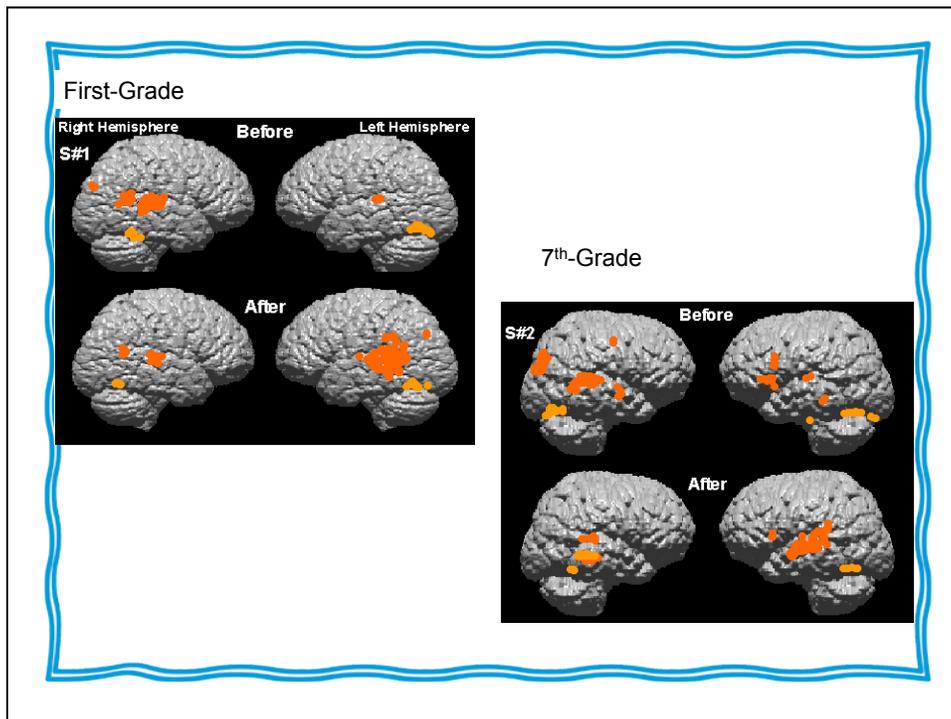
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Intervention! (NRP, 2000)

The **National Reading Panel** concluded that “ . . . **teaching children to manipulate phonemes in words** was highly effective under a variety of teaching conditions with a variety of learners across a range of grade and age levels and that teaching phoneme awareness (PA) to children significantly improves their reading more than instruction that lacks any attention to PA.”

Before and After Effective Intervention – Brain Activation Patterns Change





Background Noise Interferes with PA Development

- Neural processing of consonant speech sounds **in noise** is fundamental for language and reading development
- Poor processing in background noise in 4 year olds predicts later reading difficulties

White-Schwoch T, Woodruff Carr K, Thompson EC, Anderson S, Nicol T, Bradlow AR, et al. (2015)- -

Summary So Far

- Phonological processing weaknesses typically characterize poor readers at all ages
- Phoneme awareness tasks (segmenting, identifying and **manipulating** individual speech sounds in words) are important predictors of risk
- Some students with reading difficulties do not demonstrate weaknesses on PA tests
- Teaching PA in the first year of schooling has lasting beneficial effects

Phoneme Awareness: How Many Speech Sounds?

ice _____

sigh _____

peak _____

keep _____

weight _____

cheese _____

song _____

fox _____

Phoneme Segmentation of “Hard Words”

LANGUAGE, SPEECH, AND HEARING SERVICES IN SCHOOLS, October 2008, 39, 512–520

% correct

	SLPs	Teachers
knuckle	90	73
sing	71	45
think	75	41
poison	60	34
squirrel	51	18
quick	70	11
box	61	10
start	31	6
fuse	21	3
use	17	3

Think Sound, Not Spelling

**Phonological awareness
can be done in the dark!**

Pronunciation (articulation) is key.

A phoneme is NOT a letter!

Children Confuse Sounds That Are Alike

<u>E</u> FRY	e <u>v</u> ery
<u>I</u> NEMS	i <u>t</u> ems
<u>P</u> ASMET	<u>b</u> asement
<u>G</u> OACH	gar <u>a</u> ge
<u>S</u> GAT	s <u>k</u> ate

Which Errors are Phonologically Driven?

#6

1 fnn fan	6 wot wait	11 gmm dream
2 pnt pet	7 gok chunk	12 bab blade
3 dng dig	8 cld sled	13 kog coach
4 mip mob	9 sng stick	14 fit fright
5 rop rope	10 gnt shine	15 cne snowing

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Refer to Mouth Position When Teaching Speech Sounds

- How high is the tongue?
- What part of the tongue (tip, middle or root) is lowered or raised?
- What is the position of the lips?
- Is the sound stopped or continuous?
Nasal or not nasal?

Ehri, L. (2014) *Scientific Studies of Reading*

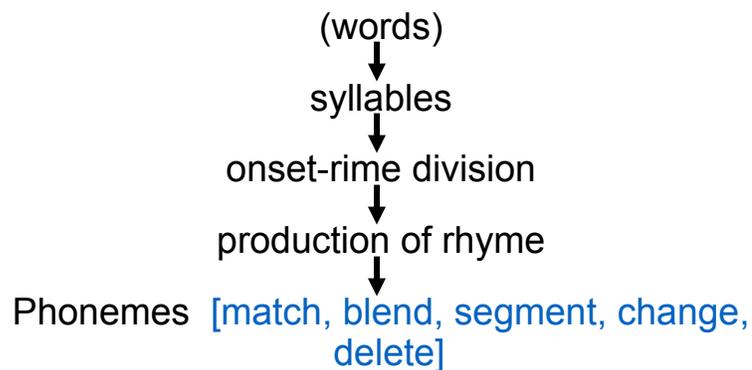
PA Benchmarks Between Ages 4–9

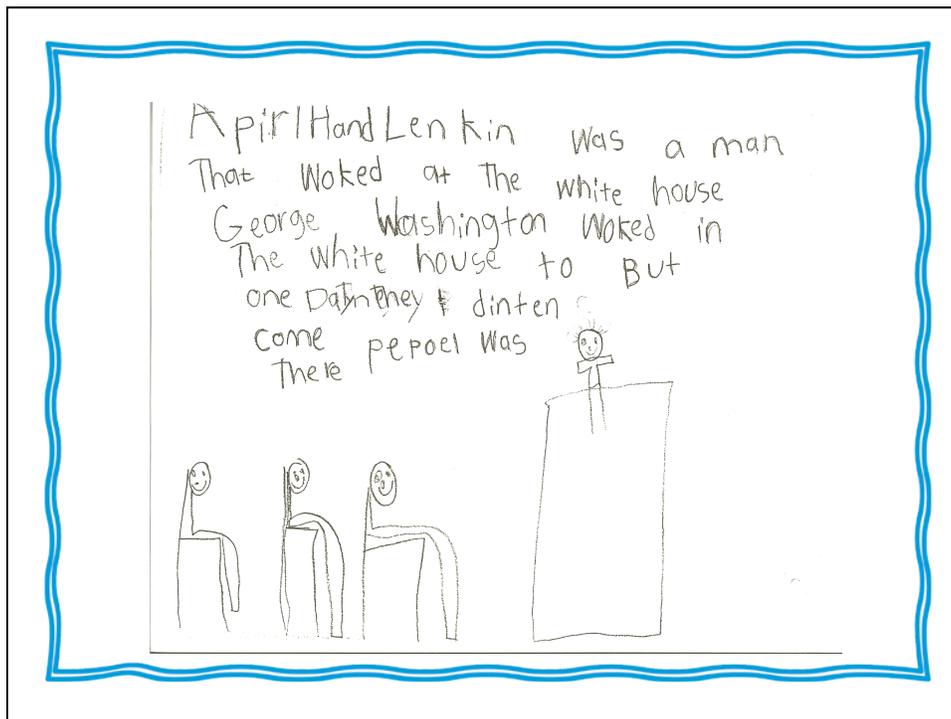
Typical Age	Skill Domain
4	Rhyme identification, alliteration.
5	Rhyme production, phoneme matching, syllables counting.
5.5	Onset-rime, initial consonant isolation.
6	Phoneme blending, segmentation (simple).
6.5	Phoneme segmentation, blending, substitution.
7	Initial and final sound deletion.
8	Deletion with blends.
9	Longer and more complex deletion tasks.

General Principles of Instruction

- brief [10–15 minutes], distributed, frequent lessons
- two to three activities within a lesson
- goal is phoneme segmentation/ blending by first grade, manipulation thereafter
- progressive differentiation of what's in a word – larger linguistic units to smaller

Explore Phonological Space





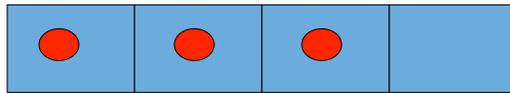
General Principles, Teaching PA

- teach the IDENTITY of each sound
- have children produce words and sounds
- model, lead observe (I do one, you do one)
- give immediate corrective feedback
- use movement – vocal, manual, whole body
- transition to letters as appropriate.

Using Sound Boxes

- Say the word.
- Model: listen as I say the sounds.
- Guided practice: let's do one together.
- Now you map the sounds.

/sh/ /ar/ /k/



Sound Substitution With Colored Blocks

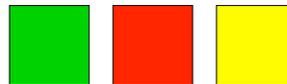
• Show me “shop”.



• Now show me “chop”.



• Now show me “chip”.



Sound Chaining with Colored Blocks



steem



stream



street



streets

Exercise: Minimal Pairs and Sound Chaining

- three, free, tree, tee, teem, steam, stream, streams, streets

- rain, _____, _____, _____

Phonemic Awareness: Reversal

pay	male	safe
sick	lime	note
Max	sign	file
zone	chow	ice



Correcting Spelling Errors

Example: Hold your nose!

med	(mend)
pasmet	(basement)
trasplant	(transplant)
quitet	(quintet)

Word perception, memory, and retrieval depend on phonological processing.

/f/ /l/ /u/ /sh/
/f/ /l/ /e/ /sh/
/f/ /r/ /e/ /sh/

assess, access
secede, succeed
relative, relevant

Recognition of word form enables access to word meaning (Perfetti, 2011)

Correcting Confusions

- Did I say cloud or clown?
- Say this after me: “ir-reg-u-lar” “nu-cle-ar”
- Is your word (“abset”) the same as mine? “absence” What is different?
- What was the word we just learned? (word retrieval)

Adaptations for Children at Risk

- Reduce competing noise.
- Say everything clearly and at an appropriate volume.
- Ask children to look at you when you speak. Touch if necessary.
- Ask for oral production of sounds and words.
- Write or use pictures and objects as you talk.

“Know your stuff; know who you are stuffing; and stuff every minute of every lesson.”

Joe Torgesen

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