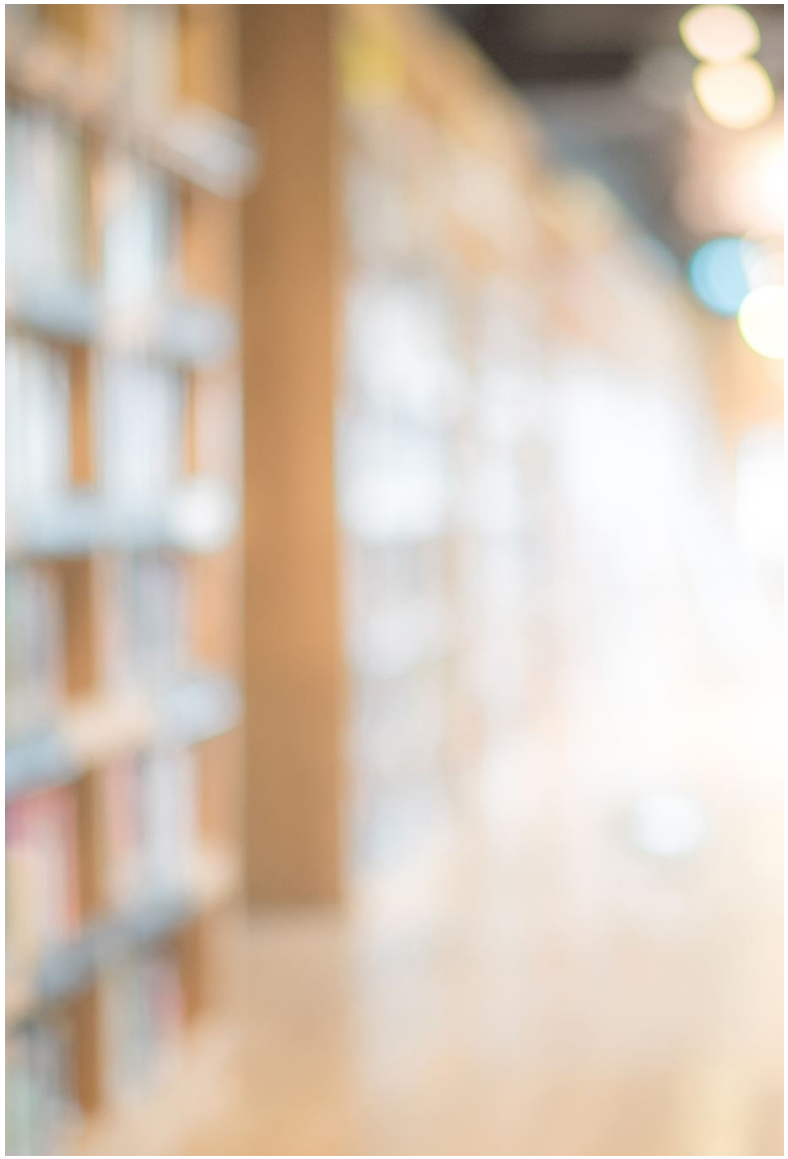
Science of Reading – Sound Beginnings

Timothy Shanahan

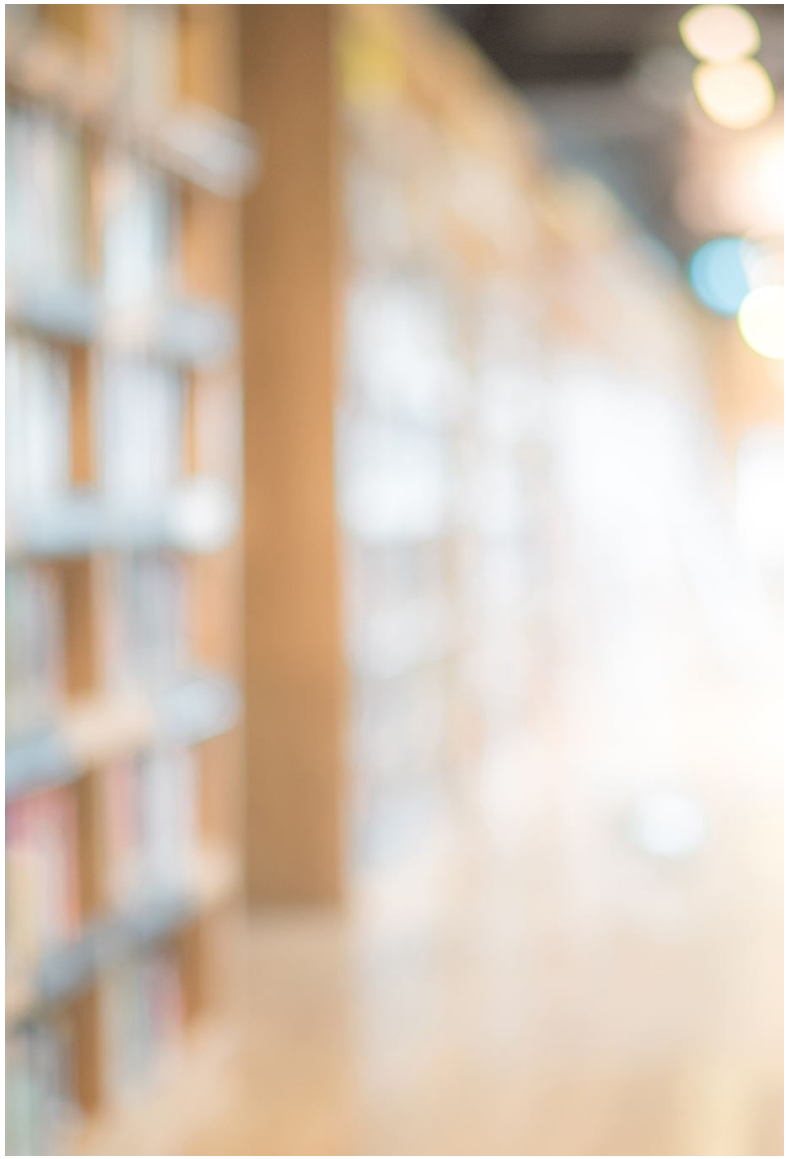
University of Illinois at Chicago

www.shanahanonliteracy.com



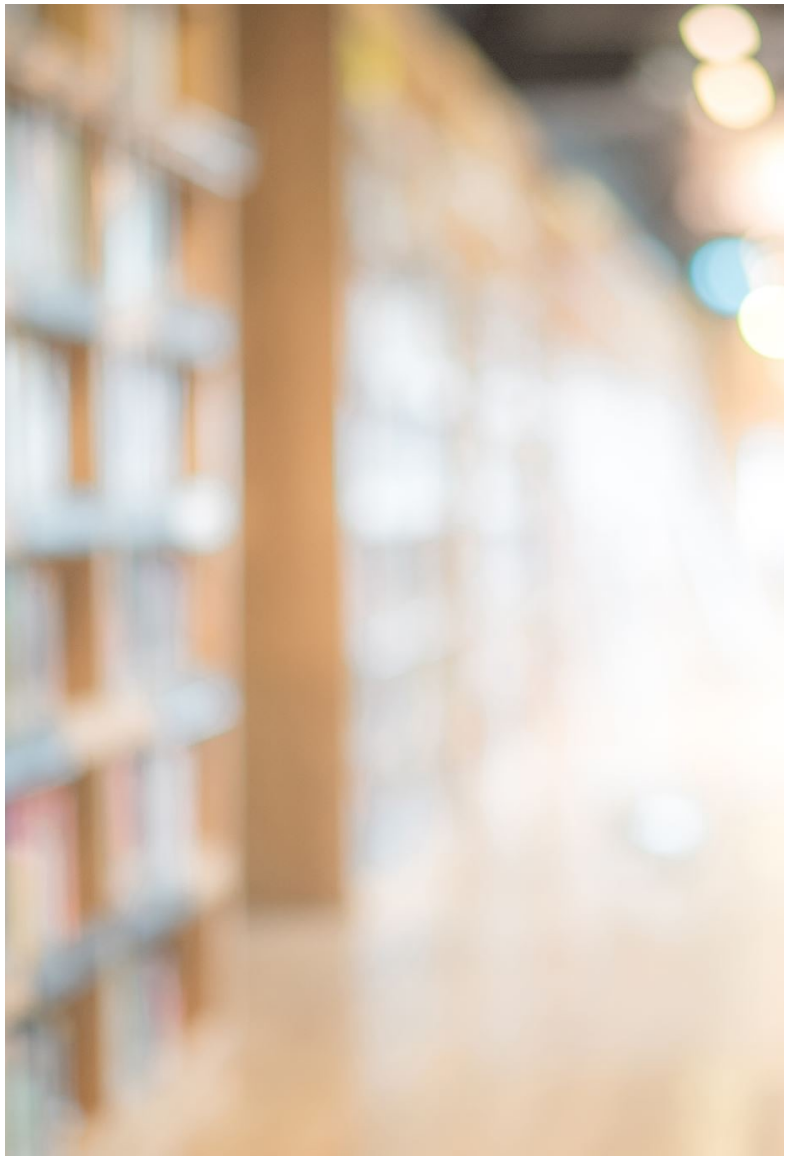
Science of Reading

- The term “science of reading” is in vogue, but has no well-agreed upon meaning
- The source of its current popularity is a radio documentary of Emily Hansford
- Hansford’s revealed widespread neglect of phonics instruction in schools and teacher preparation institutions despite research into the importance of decoding and the effectiveness of phonics instruction
- This has led many to use the term solely and specifically to refer to phonics instruction



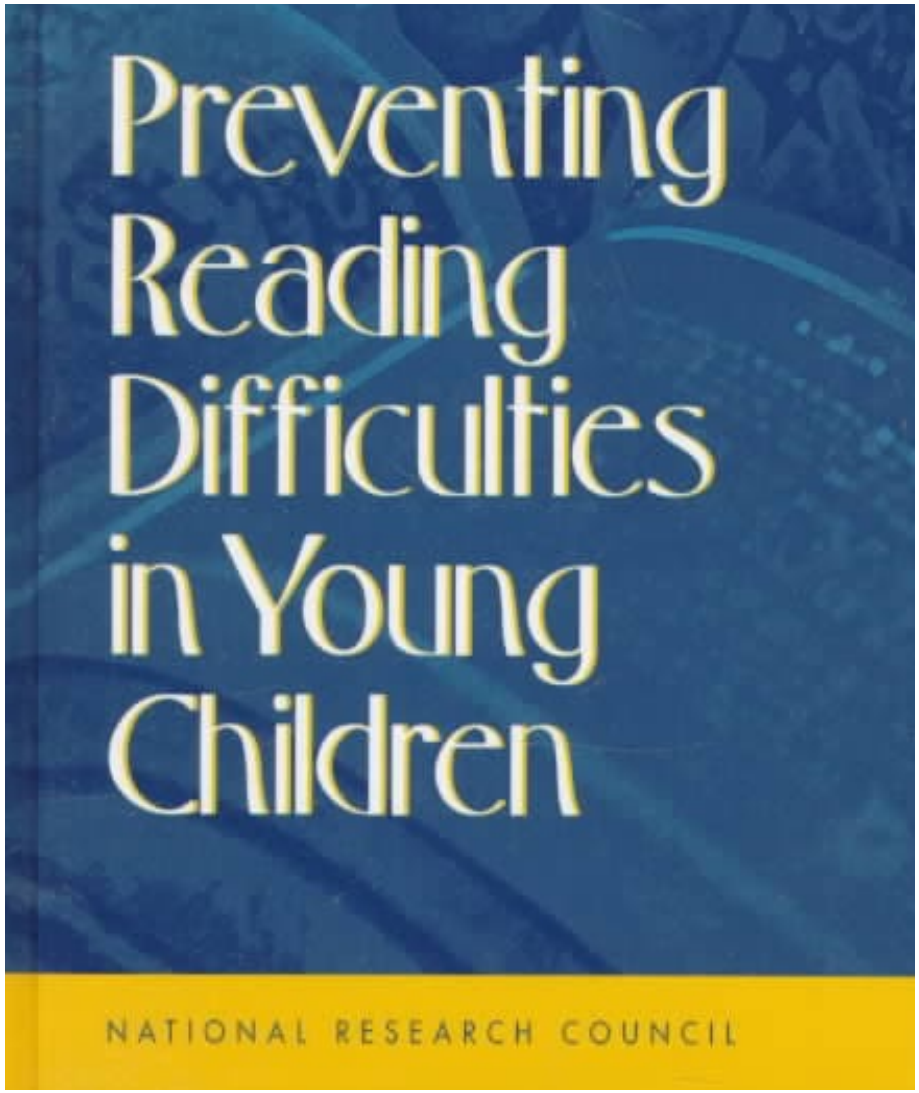
Science of Reading (cont.)

- Misuse of the term has led to pushbacks within the reading community (and regrets from Ms. Hanford)
- There is a plethora of articles/presentations emphasizing a much broader conception of SOR and those treatments highlight the importance of other aspects of instruction
- However – no matter what else needs to be taught – we should not lose sight of the fact that decoding instruction has been neglected and misdirected in the recent past



Science of Reading (cont.)

- My use of the term is more in line with the former federal government definition of ”scientifically-based reading research, SBRR”
- To claim something works you need to have sound research evidence showing that such instruction improved learning for students
- That’s why what I will share today is consistent with the following sources


Preventing
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in Young
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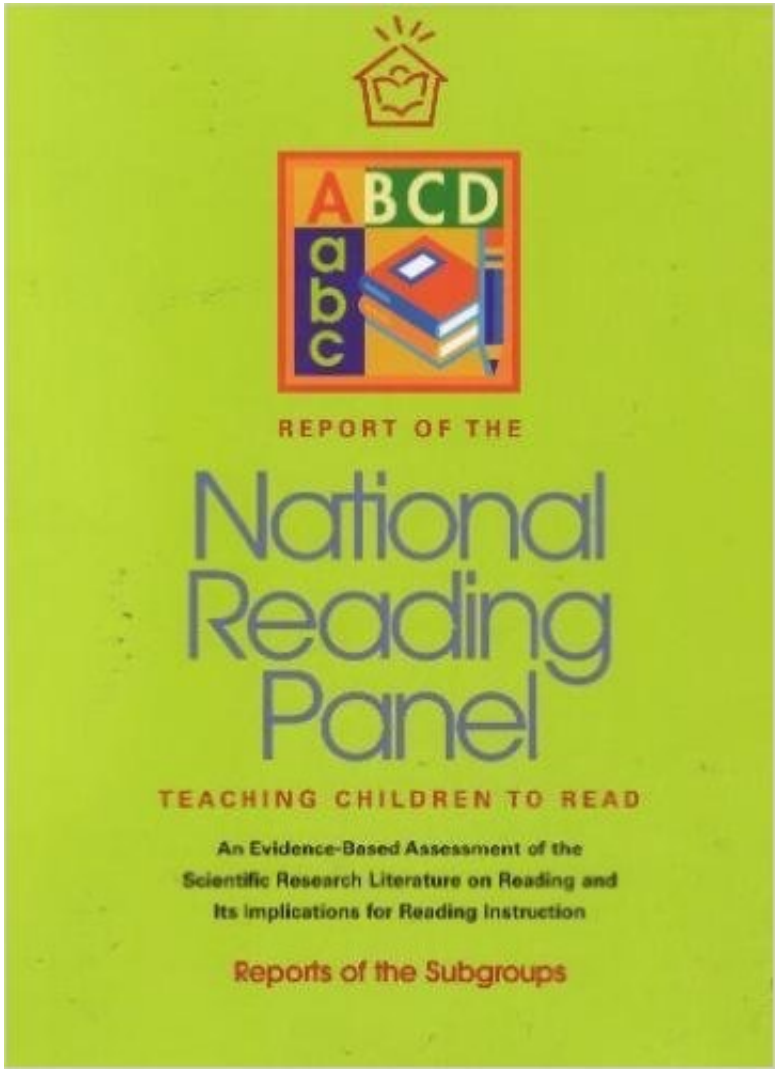
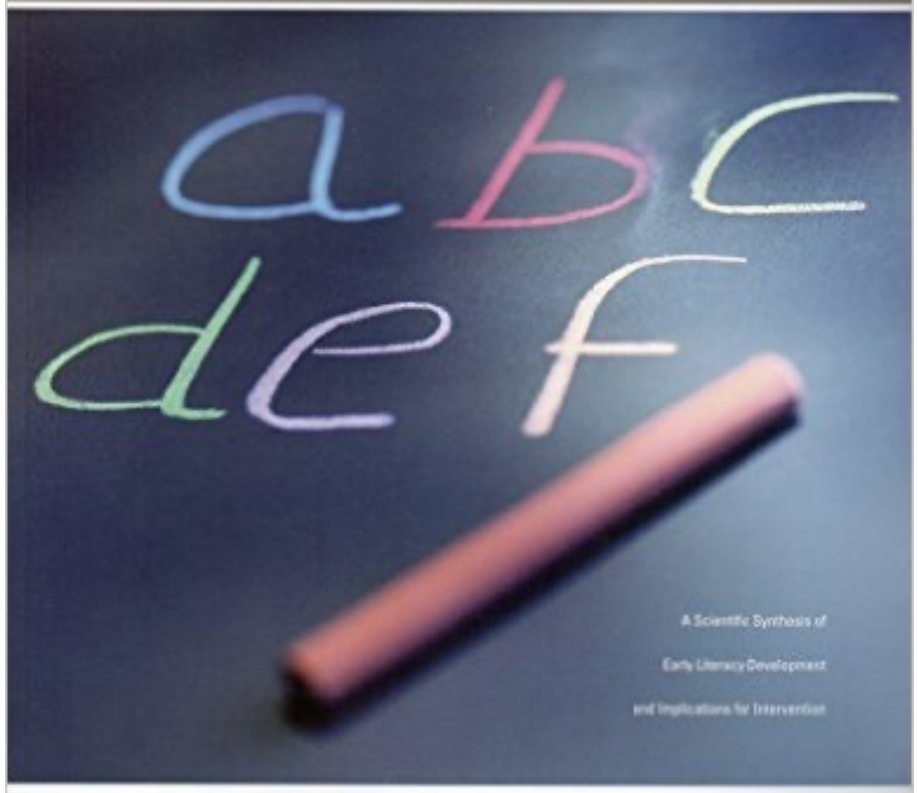
NATIONAL RESEARCH COUNCIL


ABCD
abc
REPORT OF THE
National Reading Panel
TEACHING CHILDREN TO READ
An Evidence-Based Assessment of the Scientific Research Literature on Reading and Its Implications for Reading Instruction
Reports of the Subgroups

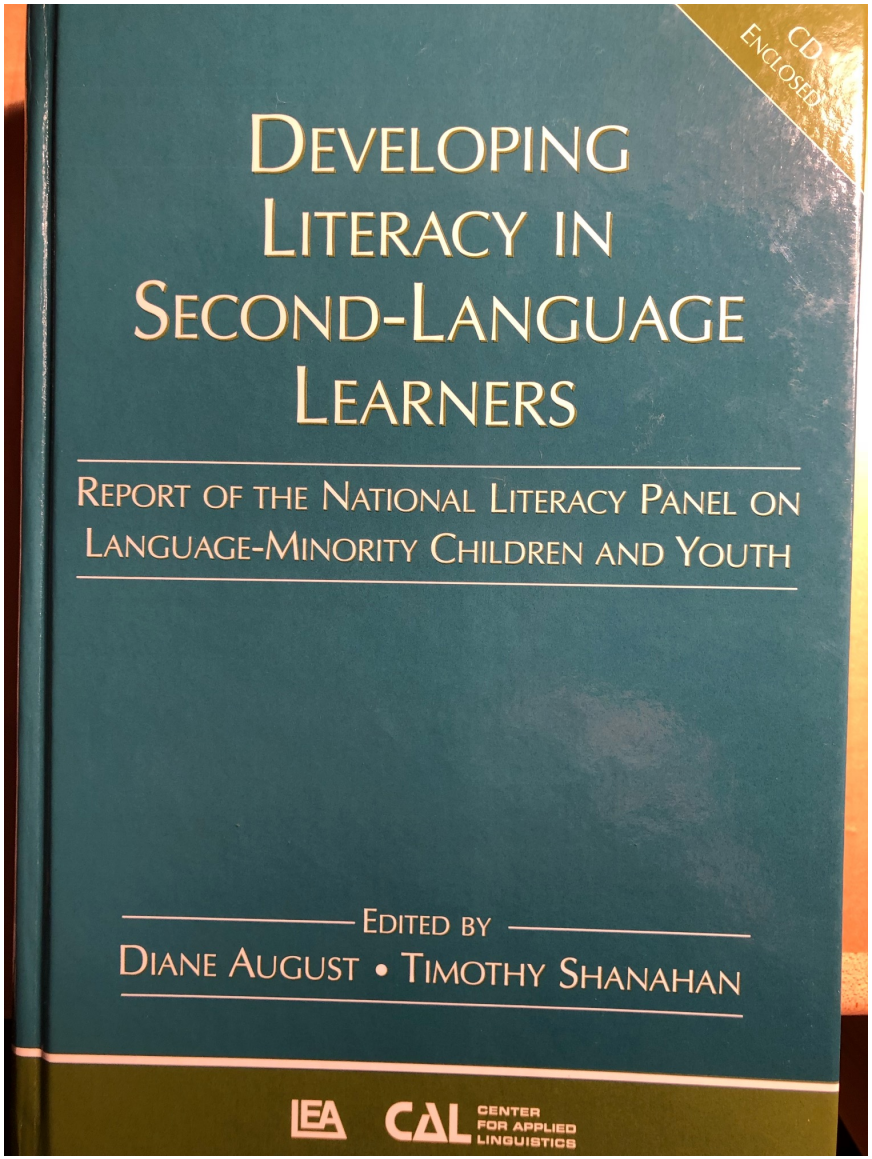
Developing Early Literacy

REPORT OF THE NATIONAL EARLY LITERACY PANEL



A Scientific Synthesis of
Early Literacy Development
and Implications for Intervention

National Institute for Literacy


CD
Enclosed
Developing Literacy in Second-Language Learners
Report of the National Literacy Panel on Language-Minority Children and Youth
Edited by
Diane August • Timothy Shanahan
LEA
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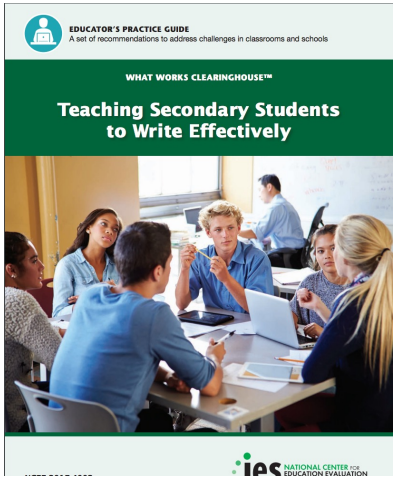
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A set of recommendations to address challenges in classrooms and schools
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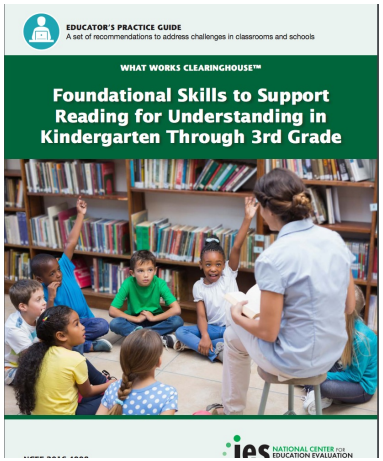
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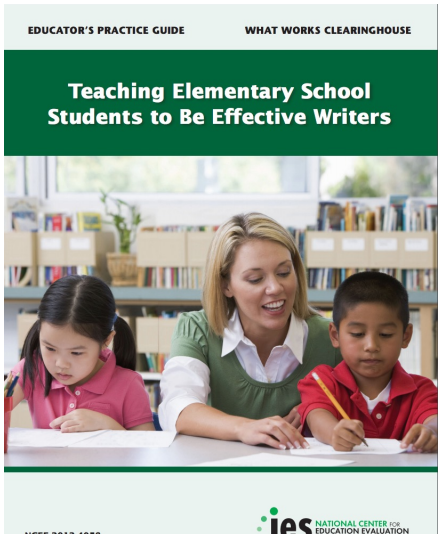
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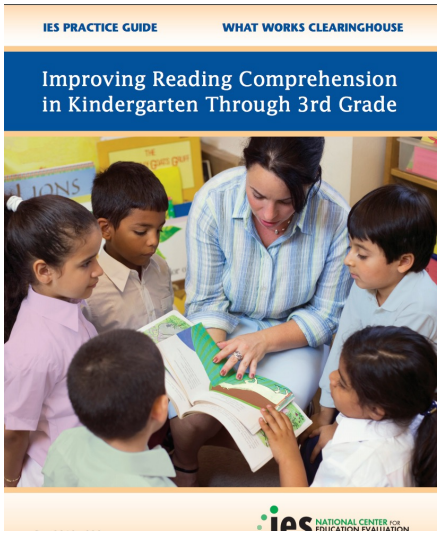
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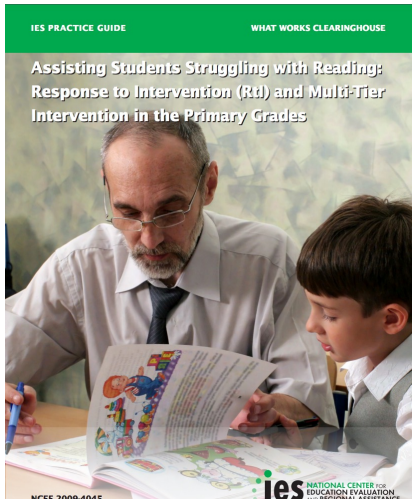
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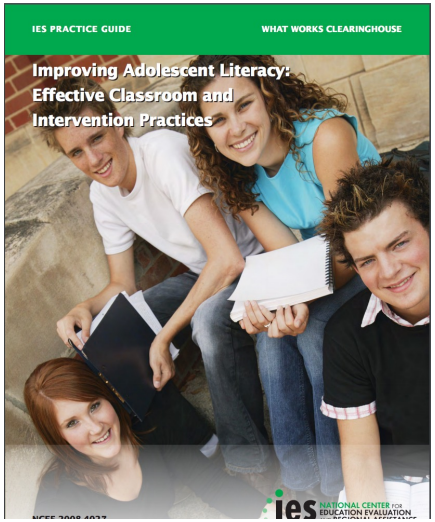
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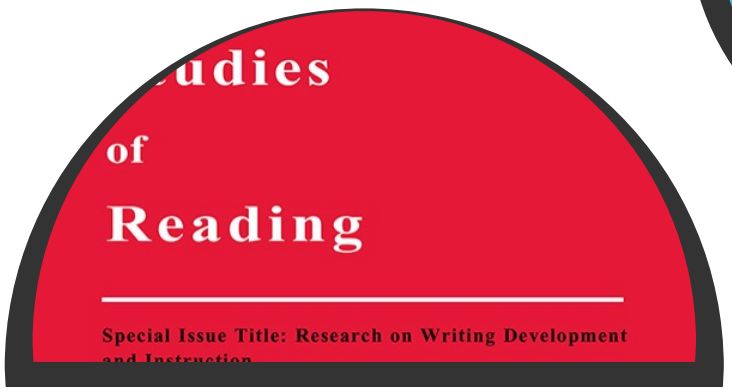
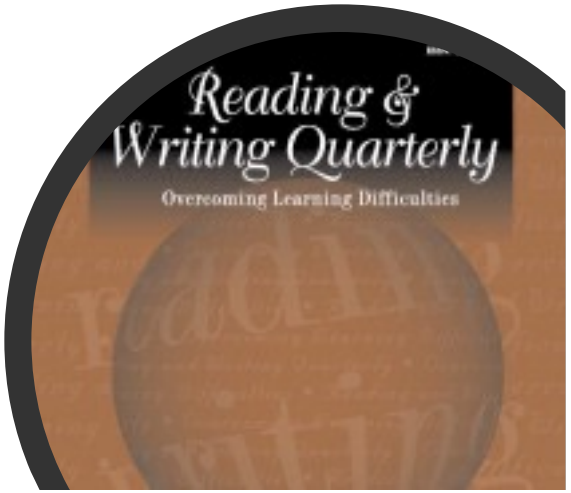
VISIBLE LEARNING: The Sequel

A SYNTHESIS OF OVER
2,100 META-ANALYSES
RELATING TO ACHIEVEMENT

Up To Date Research





Reading Improvement

Reading improvement depends on three things:

1. Amount of teaching
2. Content of instruction
3. Quality of instruction

Content of Instruction

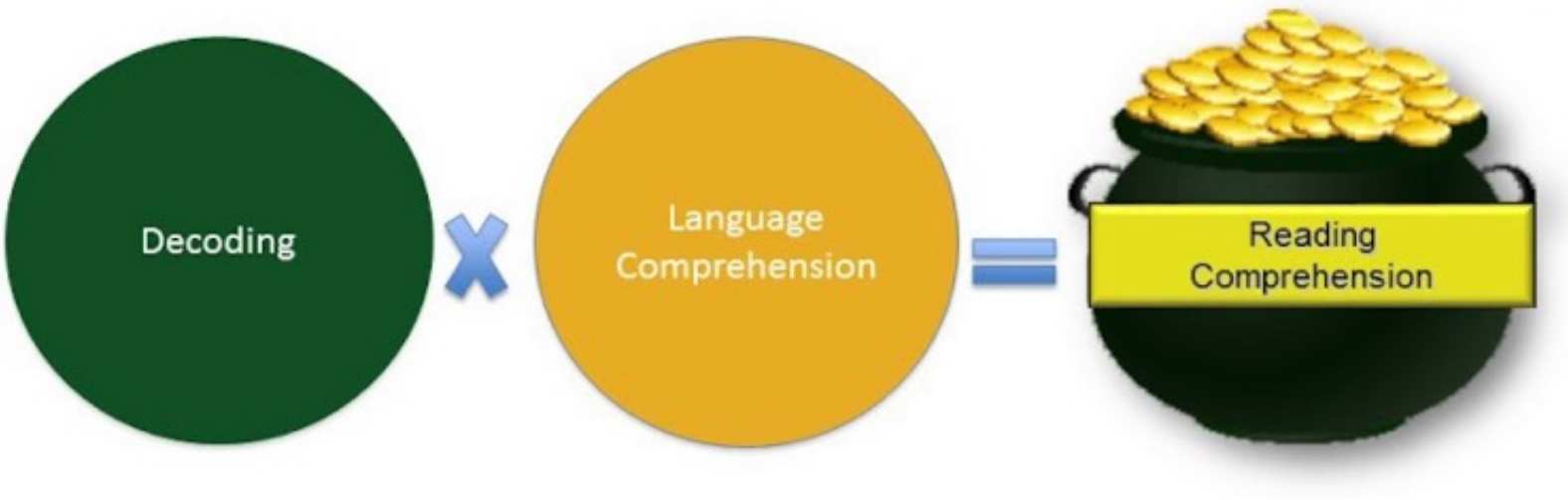
Decoding (alphabet, phonemic awareness, phonics, spelling, morphology)

Text reading fluency (accuracy, automaticity, prosody)

Reading comprehension (strategies, language, content)

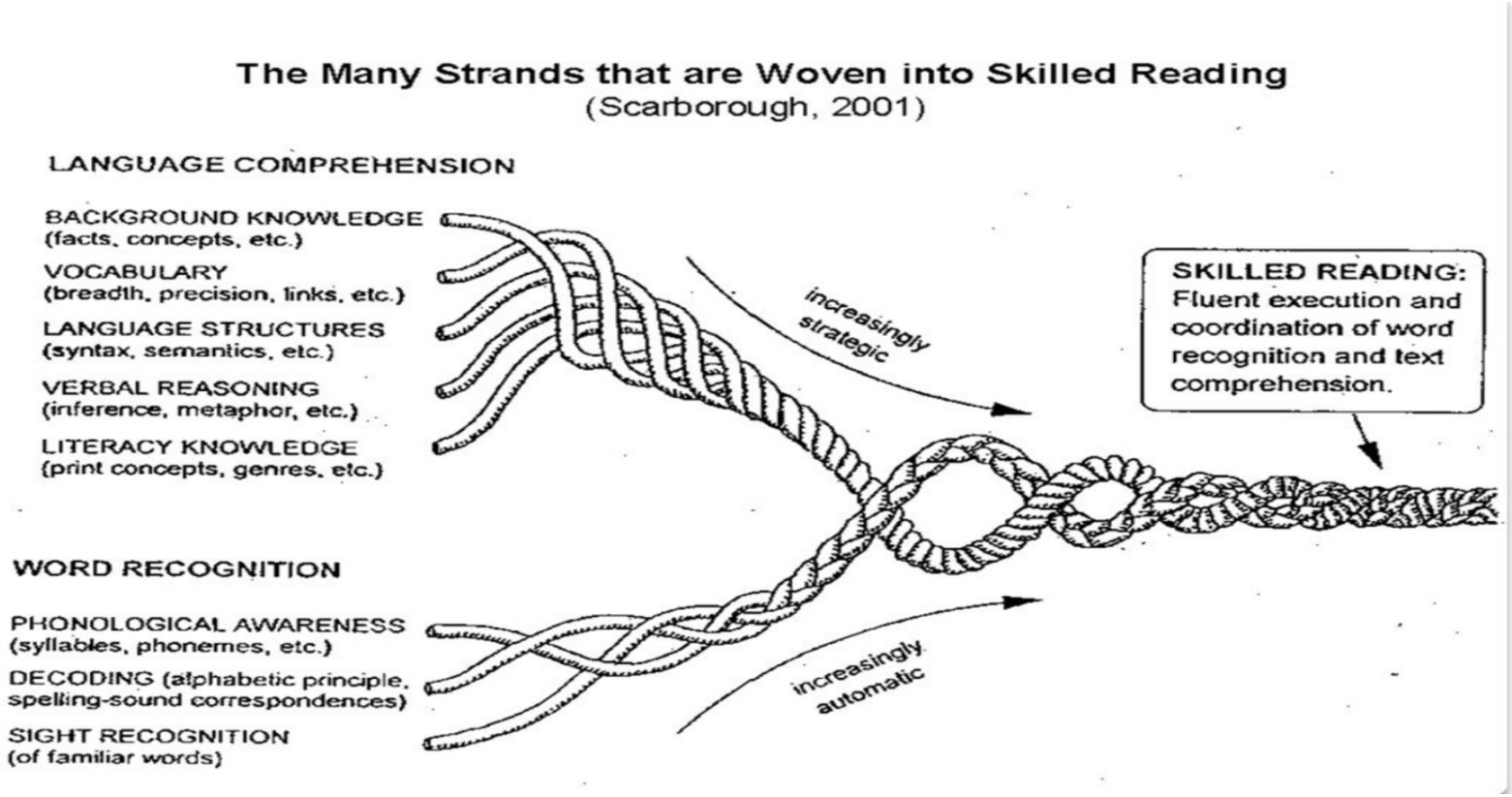
Writing (transcription, composition)

The Simple View

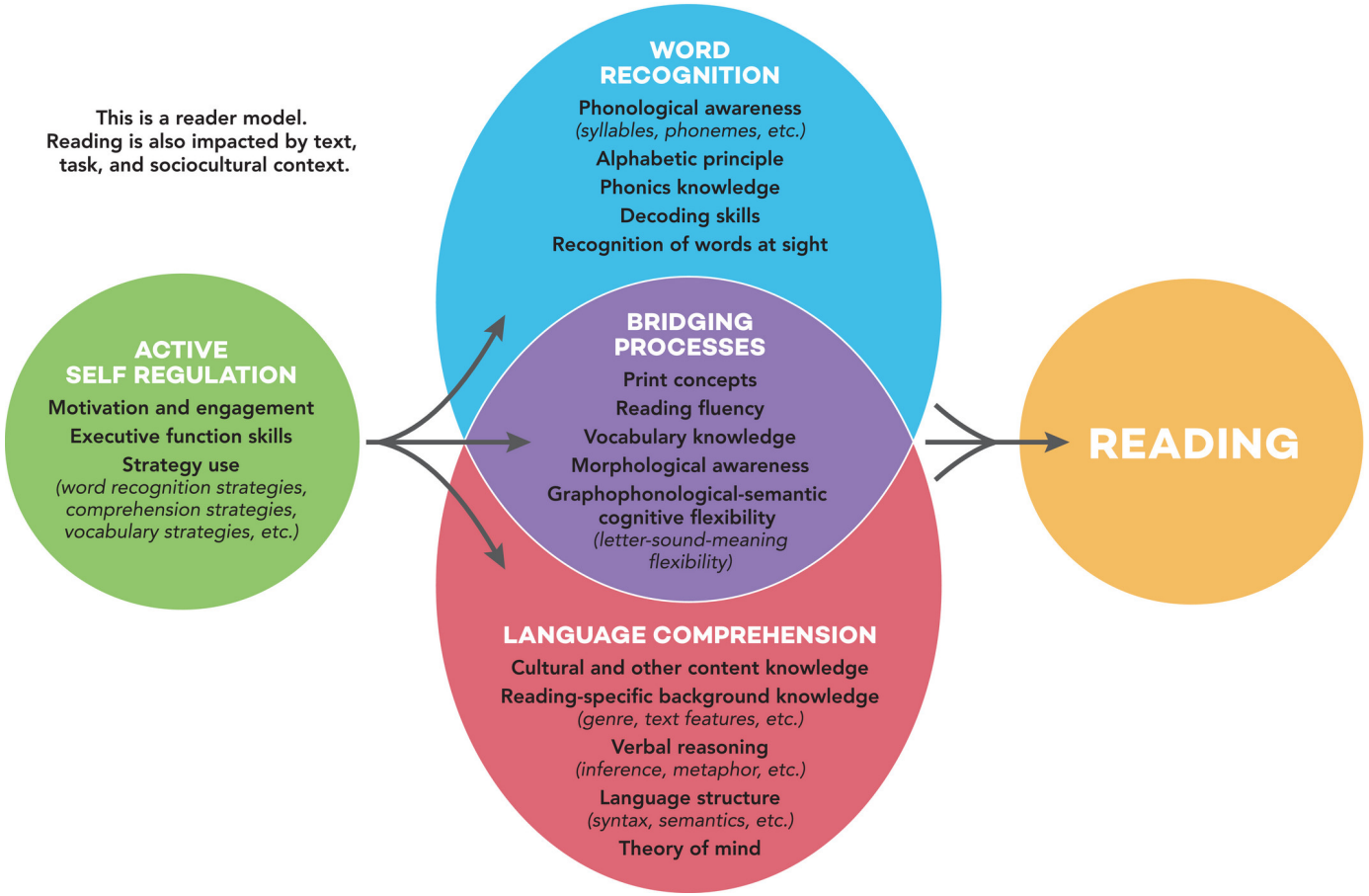


Gough & Tunmer, 1986

Scarborough's Reading Rope



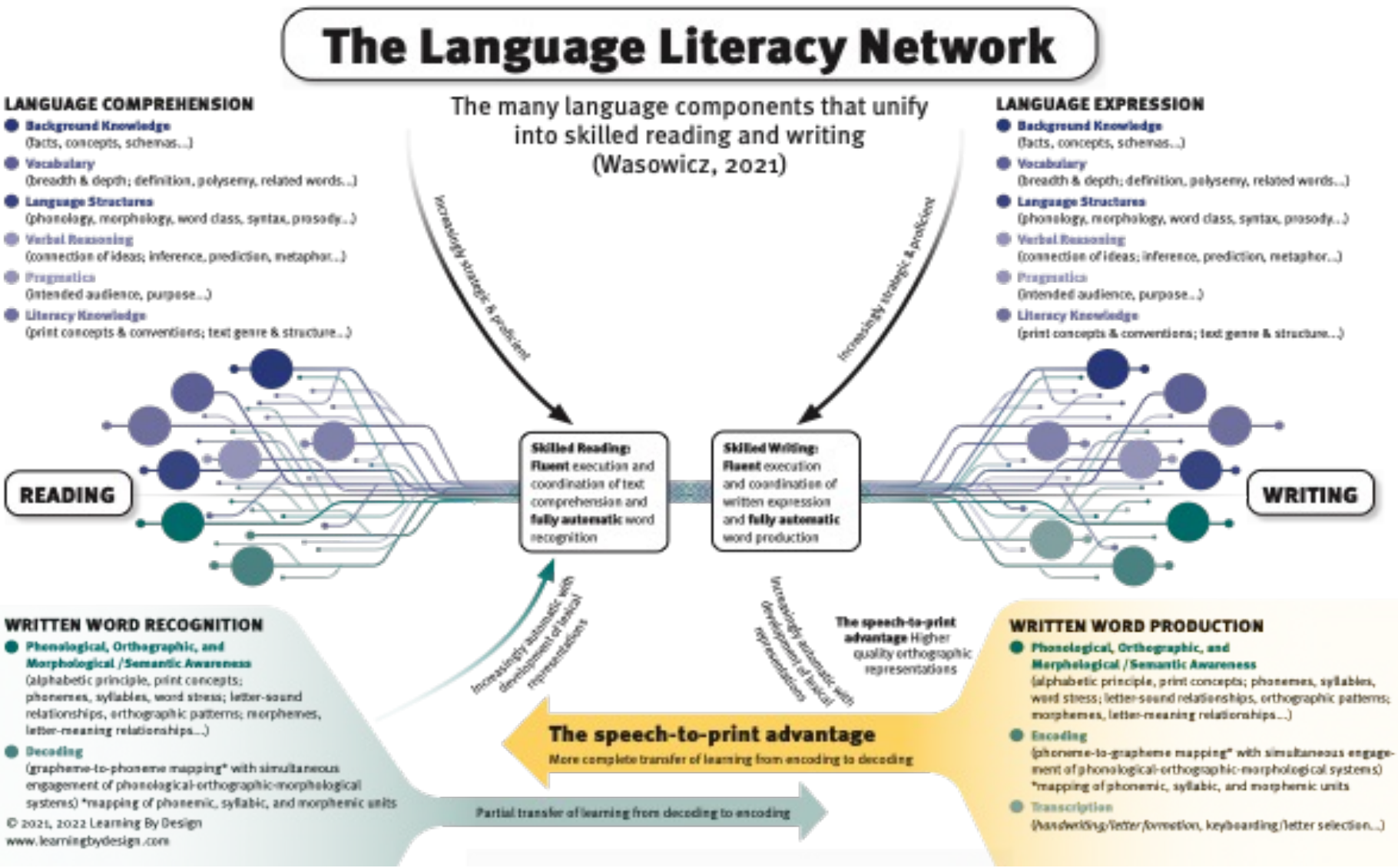
Active Reading Model

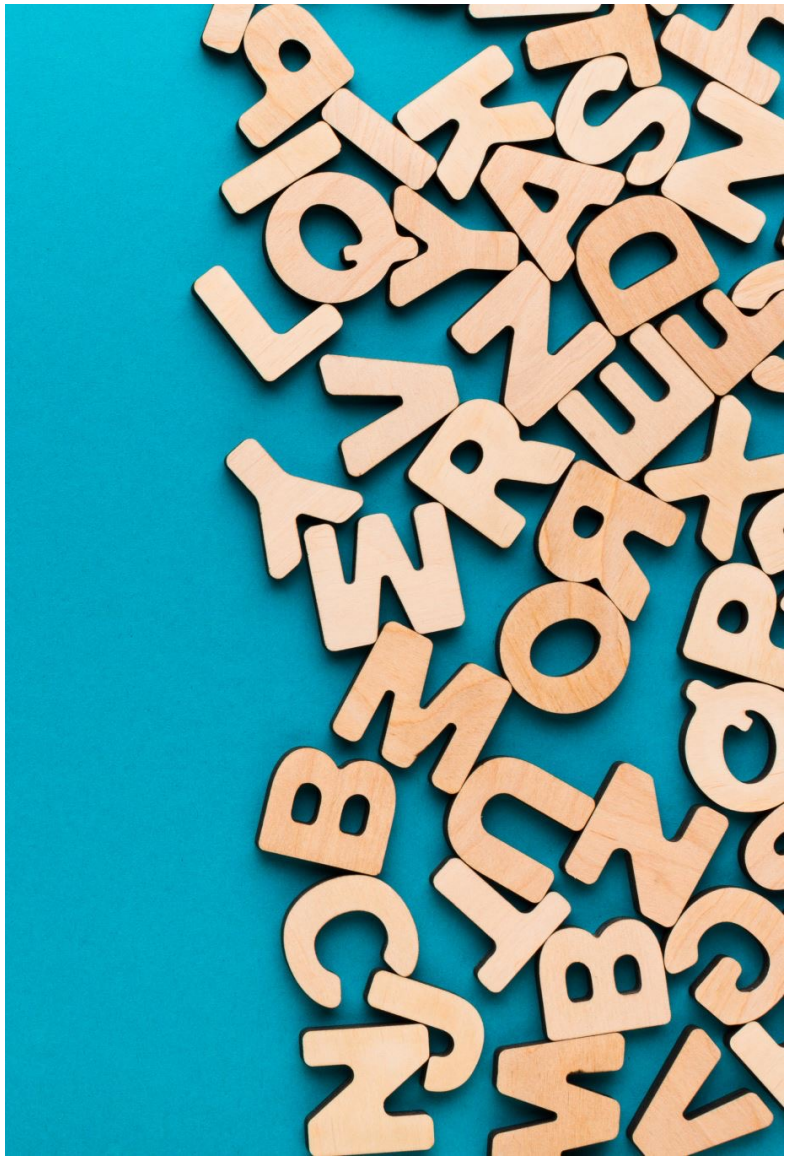


Duke & Cartwright, 2021

The Language Literacy Network

The many language components that unify into skilled reading and writing (Wasowicz, 2021)





Three Essential Epiphanies

- Words represent things and thoughts
- Words are made of letters
- Letters stand for the sounds in their language

Wolf, 2022

Beginning Reading Development

With the alphabetic principle in place, those early processes can begin to connect to each other

Explicit instruction helps students to connect visual representations of letters with phonological representations of the sounds

Letter representation and letter-sound correspondences need to connect with word knowledge (semantic, syntactic, and morphological information)

“Foundational Skills” (cont.)

Knowledge of Words and Parts of Words

--Phonological awareness

--Phonemic awareness

--Alphabet phonics

--Spelling

--Sight vocabulary

--Morphology

--Word meaning

--Syntactic aspects of words

- **Oral Reading Fluency** (accuracy, automaticity, prosody)

What is phonological awareness?

Phonological Awareness

- English is an alphabetic language – letters/spellings refer directly to the sounds of the language
- Young children can usually hear well, but that doesn't mean that they can perceive language sounds separately from meaning
- Phonological Awareness is the ability to hear and manipulate language sounds including word and syllable separations and the phonemes within spoken words
- Phonological aspects of language only deal with sounds (they have nothing directly to do with letters or spelling patterns)

What is phonemic awareness?

Phonemic Awareness

- A phoneme is a perceptually distinct unit of sound in a language that distinguishes one word from another (p, b, d, t in the words pad, pat, bad, bat)
- There are 42-44 phonemes in the English language (out of approximately 500 that exist across all languages)
- Phonemic Awareness refers to the ability to perceive and manipulate these small units of sound within words – in English that means perceiving those 42-44 phonemes

What is the relationship between phonological and phonemic awareness?

PA versus PA

- Phonemic Awareness is a part of Phonological Awareness – the part of it that develops last – phonological development goes from gross sounds (like words and syllables) to smaller sounds (phonemes)
- As such, being the last part to develop, phonemic awareness is the part most related to early reading development. -- students low in PA have difficulty learning to decode

What is phonological development?

Phonological Development

- Infants are born with the potential to perceive and use in oral language all ~500 phonemes
- They spend most of the first year of life paring this potential down – being shaped by their language environment to pay attention to particular sounds relevant to the language being learned
- Attention shifts from phonemes to words (from about 18 months to 5 years)
- Wide variation in later development – going from gross sounds (like words and syllables) to individual phonemes
- Phonemic awareness tends to develop for most people between the ages of 4-8 in any language including those without alphabetic languages

Is there any reason to teach phonological awareness?

Phonological Awareness Instruction

- Maybe – though currently it is being challenged
- It is clear from preschool studies that such teaching is beneficial in terms of later reading achievement – though the reason for this is not clear
- Some authorities claim that it is possible to successfully teach phonemic awareness even if students are low in those grosser phonological skills
- Studies of phonemic awareness instruction have not made that distinction, so it is possible that phonological awareness can be ignored with school aged students
- However, if I were teaching young children and they were struggling with phonemes, at the very least I would evaluate those grosser language units and if there was a gap, I would start there

Should we teach phonemic awareness?

Value of Phonemic Awareness Instruction

- Yes, indeed
- National Early Literacy Panel (2008) meta-analyzed approximately 50 studies finding that instruction in PA in pre-K and/or K (alone, combined with AK, combined with phonics) led to significant learning impacts on PA, AK, Reading, Spelling
- NRP meta-analyzed 51 studies finding that phonemic awareness instruction in K, 1, and for remedial students led to significant improvements in phonemic awareness, decoding, reading comprehension, and spelling (NICHD, 2000)
- NLP (2008) found that phonemic awareness instruction was beneficial for second-language students, too
- More recent studies concur (e.g., Ashby et al., 2013; Edwards et al., 2016; Loeb, et al., 2009; Pollard-Durodola, et al., 2009; Rice et al.,2022; Suggatge, 2016)

Value of Phonemic Awareness Instruction

- State standards require PA
- Logically we should teach it – if all models of reading indicate the importance of teaching phonics, decoding, word recognition, word reading, etc. and English is an alphabetic language then it would make sense that we would ensure that students could perceive the phonemes that must be matched to letters and spelling patterns
- Some children have special disabilities affecting their phonemic awareness development and even many normally developing children will not accomplish this as early as needed for learning to read (instruction increases their chances of success)

What is the goal of phonemic awareness instruction?

Goal of Phonemic Awareness Instruction

- The purpose of phonemic awareness instruction is to enable children to perceive phonemes sufficiently well to allow them to be successful with phonics
- Research (NRP, 2000) suggests that children need to be able to perceive phonemes well enough to fully segment words and to blend individual phonemes into words
- Notably these two phonemic awareness skills are specific to decoding ability – which is what we are trying to enable
- When students can accomplish those tasks well, phonemic awareness instruction can be discontinued

How much phonemic awareness instruction should we provide?

How much PA?

- There is no research into the optimum amount of time to spend on PA
- The National Reading Panel noted that students made the greatest progress from about 14-18 hours of instruction
- That totals out to about 15 minutes per day for one semester of kindergarten
- However, the conclusion wasn't that all students should receive those amounts (some will need more, and some less) – remember the outcome goal
- Testing students at the beginning of K-1 to see how children are doing with PA is a good idea

Which phonological and phonemic awareness skills should I teach?

PA skills

- Research has identified several phonological and phonemic skills that can be assessed and taught
- Although the goal is to enable segmenting and blending, we want to develop automaticity and flexibility with these so teaching a wider array of skills may best accomplish that
- When students can easily segment and blend, then phonemic awareness instruction can discontinue

Phonological Awareness Skills

- Word separation
- Syllable segmentation
- Onset/rime
- Phoneme identity
- Phoneme isolation
- Phoneme blending
- Phoneme segmentation
- Phoneme addition
- Phoneme substitution
- Phoneme deletion

Examples of PA Skills

PA Skill	Example
Word separation	The---man---ran---up---the---hill.
Syllabic segmentation	Ti--mo--thy--Shan--a--han
Onset/rime	b—ig; m—an; r—ug; l--amb
Phoneme identity	ball, game, baby, bat
Phoneme isolation	p—an, pa—n
Phoneme blending	/p/-/a/-/n/
Phoneme segmentation	m/a/p, t/a/b/l
Phoneme addition	re, red, redea, redeam, redeams
Phoneme substitution	map, cap, pap, rap, sap—sam, sad, saf, sag
Phoneme deletion	Ready, read, re, r

What about rhyming?

Rhyming

- Rhyming is often emphasized in PA programs and yet, of all PA skills, it has the lowest correlations with reading ability (NELP, 2008)
- Poor readers tend to struggle with rhyming, but the causal direction of this appears to be reading improvement leads to rhyming growth – not the other way around (McNorgan, et al., 2014)
- I wouldn't make a big deal out of teaching rhyme as part of PA – and lower performance with rhyming would not lead me to intensify that part of instruction

What do you think of advanced PA?

Advanced PA?

- David Kilpatrick has hypothesized that some students will require a greater amount of phonemic awareness instruction than I have recommended here
- He suggests that some dyslexic readers may benefit from PA instruction that focuses on phoneme deletion, substitution, and reversal
- If this is needed, it is only needed by a small subset of children and the hypothesis has yet to be tested – I would not do this at this time

How do you teach PA?

PA Instruction

- According to the research, PA sessions should be brief (~10-20 minutes) and intensive
- Instruction should emphasize 1-2 skills at a time (don't make it too complicated)
- Individual or small group instruction superior in analyses of research but there is also evidence that whole class instruction can be effective too – with ongoing monitoring and small group (3 students) follow up for those who lag

PA Instruction (cont.)

- Important for children to see the teacher's mouth when pronouncing words
- Stretching sounds initially can facilitate children's ability to recognize sounds (e.g., f-f-f-f-ox)

PA Instruction (cont.)

- Use of counters to provide a physical representation of a sound is beneficial
- PA with the lights off briefly – but connecting to letters is the point and it can help
- But as students progress counters can be replaced by letters

What about teaching the ABCs?

Alphabet Knowledge

- Research continues to identify knowledge of the alphabet as the best predictor of early reading success
- Studies also show that teaching the ABCs improves reading
- Combining ABC instruction with phonemic awareness teaching appears to have a substantial multiplier effect – increasing the degree to which PA instruction improves reading

Alphabet Knowledge Controversies

- Should we teach letter names or just sounds?
- Teaching letter names is helpful – the most thorough analyses (Foulin, 2005) show this
- Teaching the alphabet should include the letter names (capital and lower case), the most common letter sound for each letter, how to print the letters

Alphabet Knowledge Controversies

- Does it really make sense to teach letter names – we don't use those in reading?
- It is not entirely certain why letter names help – though they do
- One theory is that the appearance of letters can vary quite a bit visually and phonemes associated with letters introduce additional variety – letter names provides a useful label for grouping together that collection of information (letter as concept)
- Studies show that the names serve as memory anchor for learning the sounds

Alphabet Knowledge Controversies (cont.)

- Should we teach consonants or vowels first?
- Although consonants are more useful generally (one can often read words without the vowels, consonants tend to be in more informative parts of words), teaching a mix of consonants and vowels makes it possible for students to begin reading earlier

Alphabet Knowledge Controversies (cont.)

- What is the appropriate sequence for introducing the alphabet letters?
- Research has not found any sequence of letters to be superior to any others when it comes to ABCs or phonics – all sequences that have been studied seem to be beneficial
- However, most programs focus on frequency of use (teaching highly frequent letters more often than low frequency ones), they minimize confusion by not teaching similar letters together, and they mix vowels and consonants – in other words, the variation that exists within those design rules don’t matter much

Alphabet Knowledge Controversies (cont.)

- Should we teach lower case or capitals?
- Lower case letters are more useful in reading than upper case
- However, children are more likely to come to school knowing at least some upper-case letters
- 14 of the lower-case letters are quite similar to their upper-case counterparts (c, f, k, m, o, p, s, etc.) – which should reduce the amount of teaching needed for students who know capitals
- There is no reason not to teach both capitals and lower case together

Alphabet Knowledge Controversies (cont.)

- What about letter of the week?
- Research suggests that students can make faster learning progress in K, 1 with a more ambitious letter learning agenda

How should we teach the ABCs?

Teaching the ABCs

- One research-supported approach included the following steps (Jones, Clark, & Reutzel, 2012)

1. Letter name identification (1-2 mins)
2. Letter sound identification (2-3 mins)
3. Practicing with letter in text/Matching letter and sound (3-4 mins)
4. Producing the letter form (4-5 mins)

Teaching the ABCs (cont)

1. **Letter name identification (memorization task)**

a. Show the capital and lower-case letter

b. Tell the letter name

c. Have children repeat the name

d. Show that letter with 2-3 others and have children point to the correct one and name it

e. Provide several opportunities to respond with various combinations of letters.

Teaching the ABCs (cont)

2. Letter sound identification (matching task)

a. Tell students that the letter represents the sound

b. Show the upper- and lower-case letter and make the sound

c. Draw children's attention to how you made the sound

d. Have the children practice making the sound

e. Show them a picture of something the name of which begins with that sound

Teaching the ABCs (cont)

3. **Practicing with letter in text/Matching letter and sound**

a. Provide 3-4 letter cards at a time

b. Have students locate the appropriate one

c. Or show simple sentences and have students point to or underline the letter that is the focus of the lesson

d. Or provide pictures the students can name., and have them match the pictures with the appropriate letters that represent the initial sounds

Teaching the ABCs (cont)

4. **Producing the letter forms**

a. Demonstrate how to write letter

b. Students then practice writing it with teacher feedback

c. Use of pages that have dotted examples and arrow indicators are helpful

What is the connection between phonemic awareness and phonics?

Phonemic awareness and phonics

- Phonemic awareness and phonics are different things -- PA is about sound perception and phonics is about linking sounds and pronunciations to letters and spelling patterns
- Children benefit from instruction in both
- However, their instruction should not be as separate as this implies
- Learning these skills is interactive (PA facilitates learning to decode and decoding helps with sound perception)

Phonemic awareness and phonics (cont)

- It is not necessary to wait for some threshold level of PA before teaching letter names and sounds or basic decoding
- For instance, it is reasonable to provide 15 mins of PA and 15 mins of phonics (with phonics taking up more time as the children accomplish sufficient levels of PA)
- Likewise, once PA instruction has been completed, it is still reasonable to make sure the student is able to perceive the sounds being taught

What is phonics?

Phonics

- Phonics refers to instruction aimed at teaching the alphabetic system of English; it includes the teaching of sound-symbol correspondences and the relationships between spelling patterns and pronunciations of words; decoding from print to pronunciation.
- It is an approach to teaching (it is not a science)

Why do we teach phonics?

Why teach phonics?

- NELP examined 70 studies on decoding instruction (includes those PA studies noted earlier); found that such instruction in preschool and kindergarten had moderate to large impacts on students' reading and spelling development and on various emergent literacy skills
- NRP examined 38 studies on phonics instruction and found that such teaching in grades K-2 improved decoding, fluency, comprehension, and spelling and with older remedial readers it improved decoding

Why teach phonics? (cont.)

- NLP found that explicit phonics instruction was beneficial to second language learners
- The payoff – in terms of benefits to later reading achievement – were lower for second language students (because of lower knowledge of English) – phonics enables the reading of words, but the fewer words the reader knows the meanings of, the lesser the benefits

What is the goal of teaching phonics?

Goal of Phonics Instruction

- Often it is assumed that the purpose of phonics instruction is to teach students to sound out words
- However, there is very little sounding out in proficient reading (students do sound out initially) and what is there is only meant to be an approximation
- The real purpose of phonics is to help students to develop “orthographic mapping”
- Orthographic mapping refers to how we come to recognize words as sight words and to spell words from memory (it shapes memory)

Goal of Phonics Instruction (cont.)

- What we mean by a sight word is a word that can be recognized immediately as if there was no sounding or mediation
- Sight words are developed not from rote memorization but from forming connections among spellings, pronunciations and meanings in memory
- In other words, phonics teaches students how to approach words phonologically and to develop a systematic way of remembering words – without rote memory

Goal of Phonics Instruction (cont.)

- Basically, phonics instruction teaches students how to look at words (attending to all the letters in a sequence), how to connect visual and phonemic information, and how to store this information in memory in a bonded or connected form
- Because of this it is not necessary to teach all possible spelling patterns (instruction tips kids off to some of the most useful patterns and encourages students to notice other patterns)

Don’t students need phonemic-orthographic, semantic, and syntactic information to read?

Three cueing system

- Yes and no
- There is no question that those all play a role in the process of reading
- There is also wide agreement that all that information about words is bound together in memory
- Meaning is used to confirm the results of connecting orthography to phonology (If there is a disconfirmation, the reader must consider other pronunciation possibilities for that spelling)
- That’s the yes part

Three cueing system (cont.)

- Although all that information gets bound together in memory, what needs to initiate the process is the orthographic and phonological information
- Some approaches teach students to use context and pictures to figure out or decode words
- That can work in specific instances, but it isn't how we read – the sequence is wrong
- Basically, students are being taught what to do when they are not really reading a word – guessing from context is not how proficient readers read
- We do use that information to confirm the results of our decoding efforts
- There is no evidence that teaching 3 cueing improves reading achievement

Is phonics instruction necessary?

Is phonics necessary?

- No, it is possible to learn to read without explicit phonics instruction
- The orthographic-phonological aspects of English is a system so someone can figure it out without much overt teaching
- However, explicit phonics instruction increases the number of children who are successful in learning to read and improves average achievement levels
- Methods that don't include phonics – or that provide minimal attention to it do teach reading – are just not as successfully as comparable approaches that include explicit phonics instruction

Is the English language systematic enough to allow phonics to really work?

The Irregularity of English

- Linguistic research reveals that English is complex but also highly consistent
- English spelling is complicated for various reasons, but a major one is that the spelling represents both phonology and meaning
- As such, phonics instruction provides valuable clues to how the system works
- For this to be successful, students must be flexible, sensitive to patterns, comfortable with approximations, and self correcting
- We need to teach phonics in ways that build a mental set for variability so they can respond accordingly when their initial attempts fail

Do we need a phonics curriculum, or can we teach the skills as needed?

Phonics curriculum?

- NRP compared approaches that depended upon following a set curriculum with those in which teachers taught phonics as they thought best
- Both approaches did better than no phonics instruction
- However, the teachers who were teaching from a systematic phonics curriculum were more successful – their students made greater progress in learning to read
- It is best to follow a single systematic curriculum

Phoneme-Grapheme Correspondences

Phoneme	Word Examples	Common spellings
/p/	pit, spider, stop	p
/b/	bit, brat, bubble	b
/m/	mitt, comb, hymn	m, mb, mn
/t/	tickle mitt, sipped	t, tt, ed
/d/	die, loved	d, ed
/n/	nice, knight, gnat	n, kn, gn
/k/	cup, kite, duck, chorus, folk, quiet	k, c, ck, ch, lk, q
/g/	girl, Pittsburgh	g, gh
/ng/	sing, bank	ng, n
/f/	fluff, sphere, tough, calf	f, ff, ph, lf
/v/	van, dove	v, ve
/s/	sit, pass, science, psychic	s, ss, sc, ps

Phoneme-Grapheme Correspondence

Phoneme	Word Examples	Common spellings
/z/	zoo, jazz, nose, as, xylophone	z, zz, se, s, x
/th/	thin, breath, ether	th
/th/	this, breathe, either	th
/sh/	shoe, mission, sure, charade, precious, notion, mission, special	sh, ss, s, ch, sc, ti, si, ci
/zh/	measure, azure	s, z
/ch/	cheap, future, etch	ch, tch
/j/	judge, wage	j, dge, ge
/l/	lamb, call, single	l, ll, le
/r/	reach, wrap, her, fur, stir	r, wr, er/ur/ir
/y/	you, use, feud, onion	y (u, eu), i
/w/	witch, queen	w, (q)u
/wh/	where	wh
/h/	house, whole	h, wh

Phoneme-Grapheme Correspondence

Phoneme	Word Examples	Common spellings
/ē/	see, these me, eat, key, happy, chief, either	ee, e__e, -e, ea, ey, -y, ie, ei
/ĭ/	sit, gym	i, y
/ā/	make, rain, play, great, baby, eight, vein, they	a__e, ai, ay, ea, -y, eigh, ei, ey
/ĕ/	bed, breath	e, ea
/ă/	cat	a
/ī/	time, pie, cry, right, rifle	i__e, ie, -y, igh, -i
/ŏ/	fox, swap, palm	o, wa, al
/ŭ/	cup, cover, flood, tough	u, o, oo, ou
/aw/	saw, pause, call, water, brought	aw, au, all, w, ough
/ō/	vote, boat, toe, snow, open	o_e. oa, oe, ow, o-
/o͝o/	took, put, could	oo, u, ou
/ū/ [o͞o]	moo, tube, blue, chew, suit, soup	oo, u_e, ue, ew, ui, ou

Phoneme-Grapheme Correspondence

Phoneme	Word Examples	Common spellings
/y/ /ū/	use, few, cute	u, ew, u_e
/oi/	boil, boy	oi, oy
/ow/	out, cow	ou, ow
/er/	her, fur, sir	er, ur, ir
/ar/	cart	ar
/or/	sport	or

Phonics curriculum? (cont.)

- The following pages represent a sample scope and sequence for teaching 3 years of phonics instruction provided by Louisa Moats

Year One, First Half of Year	
1st six weeks	• Name and match most upper and lowercase letters • Identify and pronounce vowel short /a/(apple) and consonants /m/, /n/, /s/, and /t/ and match the sounds to the letters that represent them • Use phonics to blend and read the words *at, an, am, man, mat, sat, Sam, Nan, mass, tan, tam*
2nd six weeks	• Name and match all upper and lowercase letters • Identify and pronounce vowel short /i/ (itch) and short u /u/ (up) and consonants /f/, /r/ and match the sounds to the letters that represent them [r before vowels only] • Blend and read words (*in, it, is, rim, run, sun, Tim, rut, mutt, mum, rat, ran*)
3rd six weeks	• Identify and pronounce short vowel /o/(octopus) and consonants /h/, /d/, /k/, /b/ and recognize the letters that represent them, including three ways to represent /k/ • Blend and read words with known letter-sounds (*dot, hot, Bob, cob, him, hit, has, his, hat, hid, ham, dam, bam, did, rid, kid; kiss, bad, cat, can, cab; bat, back, bat, kick, sick, sack, rack; rock, dock, hack*)

Year One, Second Half of Year	
4th six weeks	• Identify and pronounce short vowel /e/(echo) and consonants /p/, /g/, /l/, /w/ and recognize the letters that represent them • Blend and read words with known letter-sounds (*peg, get, let, lid, lip, win, wet, well, wed, web, led, gal, gap, gab, pal, pat, pad, pan, pass, sap, sag, bag, beg, egg, leg, luck, puck, pick, lick*)
5th six weeks	• Identify and produce short vowel sounds and the names of the vowel letters (long vowel sounds); say consonants /th/, /sh/, /v/, /ch/, and combination /k//s/ and match those sounds with TH, SH, V, CH, TCH, and X • Blend and read words with known letter-sound correspondences, such as *this, that, ship, shop, shed, shell, shut, mash, rash, wish, with; vet, van, vat, box, fix, wax, Max, fax; chop, chip, chuck, chin, itch, pitch, ditch, batch, witch, hutch, latch, catch*
6th six weeks	• Identify and say the short vowel sounds and the long vowel sounds in the vowel letter names; say consonants /j/, /y/, /z/, /wh/, /ng/ and combination /k//w/; match to spellings J, __DGE, Y (before a vowel), Z, WH, NG and QU • Blend and read words with known letter-sound correspondences (*judge, jam, jet, job; edge, badge, lodge; yes, yet, yen, yap, yam, yell; zip, zap, buzz, jazz; when, which, whack; sing, king, wing, ring, rang, rung, lung, song, sung, thing; quit, quick, quell, quash*)

YEAR TWO: First Half of Year	
1st six weeks	• Blend and read one-syllable words with single consonants (no blends), to review correspondences taught in Year 1 • Read words with "all" – *fall, call, mall, ball, wall, tall, hall* • Read words with plural inflection and tense marker *-s* (*mops, cans, pads, etc.*)
2nd six weeks	• Review digraph (two letters that stand for one sound) spellings TH, SH, CH, WH, and NG; review letter combinations for */k/, /ch/, and /j/* that come right after short vowels: __CK, __TCH, and __DGE • Review QU as the two-sound combination, /k/ /w/ in *quit, quack, quick, quell* • Read words with final consonant blends (*-LK, -FT, -ST, -MP*) and beginning consonant blends (*ST, FL, SN, FR, PL, SM, SK, CL*), such as *clan, milk, fast, jump, soft, stamp, fleck, smock, dust*
3rd six weeks	• Say a long vowel sound when reading words with the VCe long vowel spelling pattern: a_e, o_e, i_e, e_e, u_e; know that some "long u" sounds begin with a hidden glide sound, /y/ (*cute, cube, fume*), and others do not (*rude, prune, plume, tune*) • Explain the concepts of plural (marked by -s and -es) and past tense (marked by -ed, but pronounced as /t/, /d/, or /ed/) and read words with those inflections attached to base words with no change in the base when endings are added (*wanted, planted; kissed, passed; smelled, buzzed*) • Read and write regularly spelled words with the VCe pattern, consonant digraphs, and consonant blends, for example *take, like, shine, here, flute*

YEAR TWO: Second Half of Year	
4th six weeks	• Read short vowel and VCe (silent-e) words with inflection -s *(taps, beds, robs; makes, takes, likes, hopes, quakes)* • Read VCe words that drop silent e when inflection -ed is added: *liked, smoked, hoped, tuned, used* • Read words with long e spelled EE or EA (e.g., *see, meet, sleep, street, feed, queen; read, bead, eat, mean, teach, year)*
5th six weeks	• Make new spoken words by substituting one sound for another in a "sound chain" with emphasis on changing vowel sounds • Increase accuracy with VCe words and EE, EA words • Read words with long a spelled AI in the middle or AY at the end, such as *bait, mail, sail, aid, gain; bay, say, pay, pray, play, stay, stray* • Read words with long o spelled OA in the middle or OW in the middle or the end *(boat, coat, goat, groan, moan, road, roar; bow, snow, throw, grow, grown)* • Read words with three spellings for /er/: IR, UR, ER *(bird, burn, her, third, fur, number, under, letter, teacher)* • Read words with the AR spelling for /ar/: *car, bar, star, far, art, cart, part, smart* (note that *war, warn, wart, and warp* sound like /or/ • Read words with the OR spelling for /or/: *for, born, worn, fort, sport, short, north*
6th six weeks	• Read one-syllable words spelling long i with Y (*cry, by, my, why, shy, fly, fry*) and words with more than one syllable ending in long e spelled with Y (*baby, crazy, lady, pony, study, happy*) • Read words with diphthong /ou/ spelled with OU and OW: *our, loud, proud, about, ground, now, down, crown, crowd, owl, prowl* • Read words with diphthong /oi/ spelled with OI and OY: *oil, toil, soil, avoid, coin; toy, boy, joy, soy, enjoy* • Read words with /au/ spelled AU and AW: *pause, cause, saw, fawn, paw, crawl, draw, awful*

YEAR THREE: First Half of Year	
1st six weeks	• Combine closed and open syllables to make 2-syllable words, such as *catnap; basket, kitten, mittens, rabbit, sunset, problem, hilltop, zigzag, robot, secret, minus, bacon, music* • Identify unstressed syllables and reduction of a vowel to schwa • Read words with plural inflection and tense marker -s (mops, cans, pads, etc.), and words with inflections -ing and -ed with no changes to the base word
2nd six weeks	• Read words with PH for /f/ (phone, phantom, photo); review letter combinations for /k/, /ch/, and /j/ that come right after short vowels: __CK, __TCH, and __DGE • Review QU as the two-sound combination, /k/ /w/ in *quit, quack, quick, quell, quote, queen, quest* • Read long u spelling patterns OO, EW, UE, UI (*moon, soon, chew, flew, grew, glue, blue, juice, suit*) • Identify closed, open, and VCe syllables, and read words that combine those three syllable types such as *hopeless, combine, timeless, hateful; humid, robot, even, refuse, protect, aphid* • Identify words that drop silent e when a vowel suffix is added (*refined, deboned, amusing, supposing*)
3rd six weeks	• Read three more patterns for the long I vowel sound: IGH, IE, Y (*high, sigh, sight, fight, pie, tie, fry, fly, cry*) • Read inflections on final-y words, where y has been changed to i: *cry, cries, try, tried, study, studies, studied, party, parties partied, baby, babies, babied, crazy, craziness, story, stories* • Read common words with silent letter patterns KN, WR, and GN (*know, knew, knee, knot; write, wrist, wrong, wring; gnarl, gnat*) • Know the "soft c" pattern; read words with hard and soft c (*card, cut, cook vs. cent, city, cycle, cinch, ice, rice, ace, pace, juice*)

YEAR THREE: Second Half of Year	
4th six weeks	• Identify and read more patterns for the long o sound: O, OW, OA, OE, OUGH • Read and spell words and syllables with various spellings for /er/ - ir, ur, er, ar, or • Recognize when /er/ is the comparative ending (prettier, hotter, colder) and when it means "someone who" as in *teacher, preacher, mender, babysitter, worker* • Combine open and closed syllables with final consonant-le (Cle) syllables (*title, little; cable, scrabble; rifle, riffle; ogle, goggle; beetle, kettle*) and words with silent "t" – *thistle, whistle, castle* • Review spelling rules for adding suffixes (doubling rule, drop silent e rule, change y to I rule)
5th six weeks	• Identify and read words with more long a patterns: A, AY, AI, EIGH, EY, EA • Read two and three-syllable words by identifying the vowels, their likely sounds, and then "flexing" as necessary to make a familiar word • Read words and syllables with long vowels + r (*care, hair, cheer, fire, pure, our, sour, oar*) • Recognize and build words with a few common prefixes and say how they change meaning (*re, un, mis, pre, non*)
6th six weeks	• Identify and read words with long e patterns: E, EY, EI, IE, EE, EA • Identify and read words with irregular plurals (*shelves, loaves, lives, thieves, knives, wolves; teeth, children, women, men, mice, geese, deer*) • Pronounce and separate contractions into two words (*I'll, can't, he'd, I've, she's*) • Interpret and spell the difference between contractions, possessives, and plurals (*it's/its; hope's/hopes; chair's/chairs*) • Read words with common consonant suffixes (*-less, -ness, -ment, -ful, -ly*) and common vowel suffixes (*-es, -ed, -y, -ing, -er, -est, -ous, -able, -ible*)

How much phonics instruction should we provide?

Amount of Phonics Instruction

- NRP found that one year of phonics was beneficial, and two years and three years were even more beneficial
- Explicit phonics for grades K-2 seems appropriate
- The studies analyzed by NRP looked at phonics instruction in various time amounts (20 minutes was the shortest, 45 minutes was the longest, and 30 minutes was average)
- 30 minutes per day of phonics instruction for 3 years seems reasonable

What about differentiation?

Phonics Differentiation

- Research by Carol Connor and her colleagues found that it was more productive to have students who had mastered the phonics goals work independently on other activities (e.g., independent reading, group projects, writing)
- She found that the ability to work independently and to benefit from such activities was closely connected to their level of phonics attainment
- Some students may need additional Tier 2 support (in class or pull out)
- Some students will need phonics instruction beyond Grade 2 (need to accomplish threshold levels)
- No evidence that adjusting the curriculum or grouping for phonics is productive

Which is better synthetic or analytic phonics?

Synthetic vs. Analytic

- Synthetic phonics instruction focuses on teaching each individual letter sound and having kids try to sound each letter or letter combination (like th, sh) one at a time and then try to blend those back into word pronunciations.

- Analytic phonics focuses attention on larger spelling units or generalizations (like rimes: ab, ad, ag, ack, am, an) and word analogies (if game is pronounced with a long a then came must be pronounced with a long a).

Synthetic vs. Analytic (cont.)

- Research has found both to be effective
- The effect sizes are somewhat larger for synthetic, but these differences are not statistically significant
- The benefit of synthetic is that it is easier to learn
- The benefit of analytic is that it can be easier to apply, and it reduces blending difficulties
- Doesn’t matter which you choose apparently, but personally I have found benefits to combining them a bit

What is “connected phonation”?

Connected Phonation

- Kids tend to find blending difficult – they may know their letters and sounds but sounding the letters doesn't end up in the pronunciation of words
- Students are taught to sound out words by extending and linking the letters rather than sounding each one separately
- /d/-/o/-/g/ versus SSSSSaaaaaaammmmm
- Start with continuous consonants (like s, m, f, j, k, l), the take on the stop consonants (like b, d)

Should phonics be print to speech or speech to print?

Print to Speech or Speech to Print?

- Print-to-speech phonics teaches students to identify letters, to link sounds to those letters, and to sound out words by sounding those letters singly or in combinations
- Speech-to-print phonics starts with phonemes and pronunciations and then connecting those with letters and spellings
- There is no definitive proof that one of these is any better than the other
- The former teaches what students need to do in reading – we go from orthography to phonology-- so that would seem best
- However, there is substantial evidence suggesting that including spelling, invented spelling, dictation, writing in a phonics program makes it more effective

How do we teach phonics?

Phonics instruction

- Effective phonics instruction is explicit and systematic
- It will typically include instruction that focuses on recognizing the element or pattern, on matching it to a pronunciation
- It should also include a substantial amount of application – reading words, writing words, reading in context
- Focus should be on real words – not nonsense words (both because that isn't how decoding really works and it disrupts useful assessment practices)
- As with any teaching, review is important – revisit what you teach

Teaching a Phonic Element

- **Auditory discrimination:** teach students to distinguish the phoneme auditorily
- **Visual discrimination:** teach students to recognize the letter or letter combination in words
- **Auditory-Visual Matching:** connecting the sound/pronunciation and the letter(s)
- **Word decoding/encoding:** applying the skill to real words – blending the sounds, reading the words, and spelling them
- **Reading:** reading decodable text, practicing applying the skill

Table 6: Typical parts of a foundational reading skill lessons

Lesson segment	Approximate time required	Typical instructional activities
State the goal of the lesson		(Brief and direct statement) "Today we will learn _____."
Review previously learned material	5 minutes	• Complete a one-minute, fluency-building drill on letters or words • Reread a familiar text • Review words with known patterns • Practice sound-symbol association and symbol-sound associations
Phoneme awareness: listening to and analyzing phonemes in spoken words	3-5 minutes	• Call attention to the way a sound is formed or produced, have students look in mirrors or at each other as they form the sound • Take phonemes apart, blend phonemes together • Put a new sound into a word to make a different word
Introduce, explain new reading/spelling pattern	3-5 minutes	• Define and illustrate the concept or pattern • Look at a grapheme, produce the phoneme; hear a phoneme, pick out or write the grapheme • Clear up any confusions with similar phonemes or graphemes
Give guided practice	5 minutes	• Build words with letter tiles or cards • Map the letters in words to their sounds • Chorally read aloud 20+ words that have the pattern
Provide monitored, independent practice opportunities	5 minutes	• Practice with partners; one is "coach" and the other "reader." Reverse roles. Students read words, phrases, and sentences with patterns that have been taught. • Scan a list of pattern words that are associated by meaning, or find a word that means X
Spell and write	10 minutes	• Write letters, words, phrases, and sentences that use patterns already taught. • Formulate sentences using known words
Decodable text reading	5-10 minutes	• Practice high frequency words and read simple texts with a high percentage of pattern words already taught • Read text aloud with 95-98% accuracy

What about syllable instruction?

Syllables instruction

- There is no reason to teach syllabication initially because most of what beginners are asked to read are made up of single syllable words
- This tends to change during the second year
- Research shows that teaching syllables (for 2-9 hours is beneficial)
- This instruction should show students how to divide words
- It shows them how to apply these flexibly – such as trying to divide a word with the VCV pattern both before the consonant and after it
- If the patterns are taught as firm rules, reading achievement doesn't seem to improve

Syllable Patterns

Syllable type	Definition	Examples
Closed	Syllable with short vowel spelled with a single vowel letter ending in one or more consonants	dap-ple, hos-tel, bev-erage
Vowel-C-e (Magic e)	Syllable with a long vowel spelled with one vowel + one consonant + silent e	com-pete, -des-pite
Open	Syllable that ends with a long vowel sound, spelled with single vowel letter	pro-gram, ta-ble, re-cent
Vowel team	Syllables that use 2-4 letters to spell the vowel	beau-ti-ful, train-er, con-geal, spoil-age
Vowel-r (r-controlled)	Syllable with er, ir, or ur	in-jur-ious, con-sort, char-ter
Consonant-le	Unaccented final syllable containing a consonant before /l/ followed by a silent e	drib-ble, bea-gle, lit-tle

How do we help students develop a mental set for variability?

Set for variability

- In addition to teaching phonics, it can help to teach sight words, teach students how to correct their mispronunciations using the orthographic information, word sorts that include not just words that fit but the contradictory items too, morphology instruction

Set for variability (cont.)

Building Sight Vocabulary

- Teach high frequency/irregular words
- Memorization, yes, but getting the students to look at all the letters, using sounds when possible, and noting what is exceptional in the spelling pattern
- Visualizing the word, spelling it, spelling it with the word out of sight, comparing with known words/ patterns

Set for variability (cont.)

Mispronunciation correction

- A student reads the word “bread” to rhyme with *bead* or *great*
- He needs to use context to determine if this is correct
- In this case, he knows that pronunciation makes no sense in terms of meaning
- That does not mean he should try to guess the word based on semantics, syntax, or graphics
- Student should consider other possible pronunciations for that ea vowel
- Teaching students this process and using it when correcting students oral reading makes sense

Set for variability

Word Sorting/Comparison/Categorization

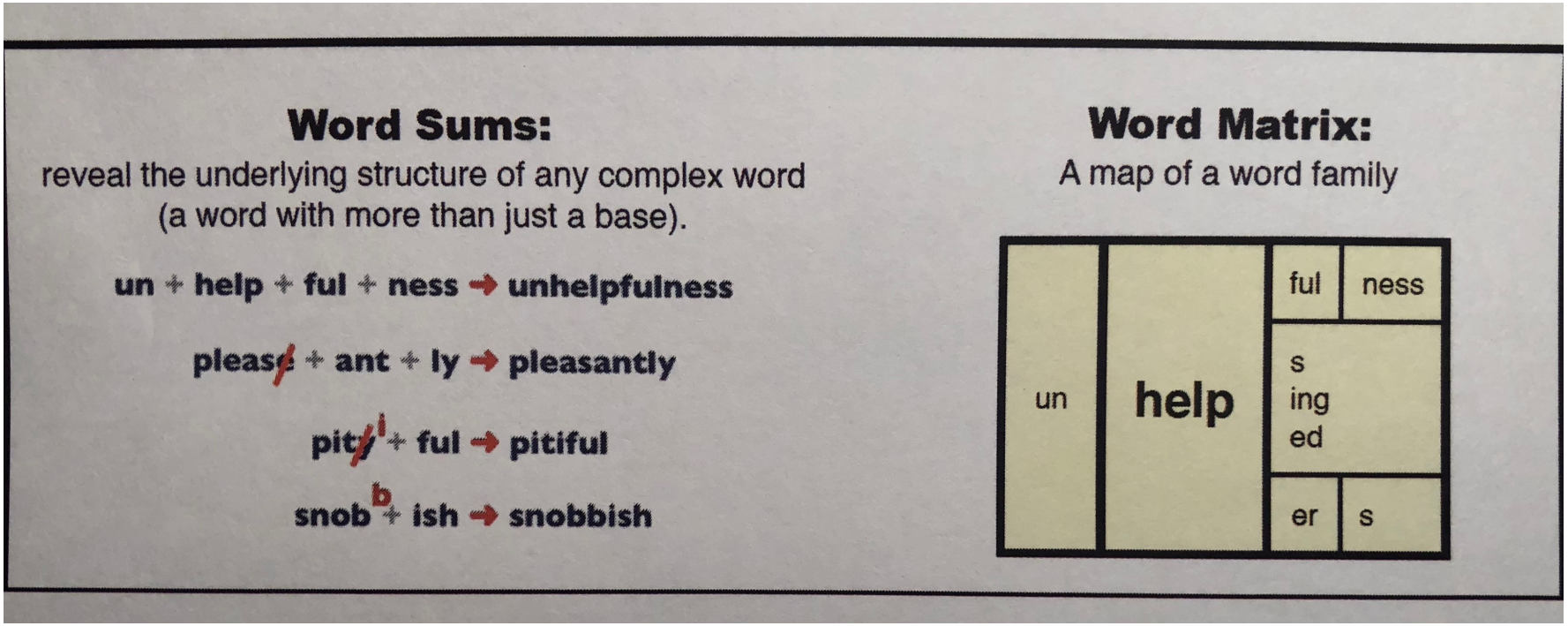
- Word sorts that include not just words that fit but the contradictory items too, morphology instruction
- Sorting word lists like: *bow, cow, how, now, pow, sow, vow, wow, chow, bow, crow, flow, low, mow, row, sow, tow, show*
- When analyzing a pattern like: *she, he, we, me include the*

Set for variability

Morphology

- English spelling reflects word meanings not only phonology
- Spelling preserves meaning across different pronunciations (cats vs. dogs)
- Studies show that teaching morphology in K-1 increases the impact of phonics instruction

Morphology



Peter Bowers & Jeffrey Bowers

What is text reading fluency?

Oral Reading Fluency

- Oral reading fluency (text reading fluency) refers to the ability to read text accurately, with automaticity, and with prosody
- Accurately means reading the author's words and correcting miscues or mispronunciations
- Automaticity means reading the text without a great investment of conscious attention (freeing space for comprehension)
- Prosody means with proper expression, making the text sound like language

Oral Reading Fluency (cont.)

- Automaticity is usually measured by speed of processing but that doesn't mean the goal is hurried reading
- Studies show that oral text reading is more closely related to reading comprehension than oral word list reading (even if it is the same words)
- Learning to apply phonics to authentic reading experiences is essential

Why teach text reading fluency?

Oral Reading Fluency

- National Reading Panel reviewed 52 studies and found that oral reading fluency instruction improved decoding, word reading, fluency, and reading comprehension in Grades 1-4 and with remedial students Grades 1-12
- Fluency is best predictor of reading comprehension in lower grades (2nd: 73% of comprehension variance explained by fluency; this declines to 25% by grade 8)

Oral Reading Fluency

- The idea of teaching oral reading fluency came from attempts to meet the learning needs of students who knew their phonics, but still did not read well (Chomsky, 1974)

How to teach text reading fluency?

Oral Reading Fluency Instruction

- Many ways to teach oral reading fluency (repeated reading, reading while listening, paired reading, neurological impress, etc.)
- What these all have in common: students are reading text that is somewhat difficult for them, reading aloud, with guidance, and repetition
- Repetitions can be limited to 3 readings

What about silent reading?

Oral versus Silent Reading

- Initially, students need to read aloud – students can’t cognitively read silently
- Oral reading demands that every word be pronounced (while in silent reading one can skim over words)
- Silent reading should also be accommodated by the second half of grade 1 or early grade 2 – for comprehension work

What kinds of texts should we use?

Types of texts

- Predictable texts
- Decodable texts
- Instructional level texts
- Complex texts

Types of texts

Predictable texts: repetition of sentence structure;

Decodable texts: limiting texts to words the students already can decode and with lots of repetition of spelling patterns;

Controlled vocabulary readers: limiting texts to words the students know and with lots of repetition of words

Instructional level text: texts that students can read with certain level of proficiency (95% word accuracy and 75% comprehension) – supposedly support learning

Complex texts: texts that challenge students in terms of topic familiarity, vocabulary, syntax, cohesion, structure, literary devices; graphic devices (not decoding)

Predictable texts

- These texts can be fun to read, and kids find them motivational
- However, they are not particularly useful for teaching reading since they discourage kids from looking at the words
- Best to use these for oral language activity, entertainment, and to support beginning writing

Decodable texts

- Research has not found a particular level of decodability to be useful in teaching reading (nor are phonics programs with decodable texts more effective than those without)
- However, it is very reasonable to provide students with practice with skills that are being taught
- Care should be taken to not limit students early reading to decodables – in part because there is some evidence that they can mislead students into thinking the language is more consistent than it is (students who have a mental set for variability do better in learning to read)

Controlled vocabulary readers

- There is no evidence that these are more effective for teaching reading, though there is evidence supporting the importance of word repetition in early reading texts
- I interweave these kinds of texts with the decodables in the hopes of giving kids that sense of variability (not proven that this works)

Instructional level readers

- Research from 2nd grade up has found that instructional level placement not only doesn't improve reading achievement, but can hold it back
- Students make greater progress when placed in texts that are at what we have long claimed to be frustration level
- We don't do that in Grades K-1 because our focus is mainly on developing those foundational decoding skills – once those are developed, then it is reasonable to place students in more complex text

Complex text

- Text can be complex in many ways
- Sometimes teachers can figure out what may block student comprehension and other times this can be determined from close questioning
- It would be unreasonable to just “throw kids in the deep end,” placing them in a complex text without support
- Instruction should guide students to recognize and respond appropriately to whatever is blocking them – the idea is instead of simply practicing reading what you already can read reasonably well to take on something you can’t yet read well and to learn to handle it

What does this all mean?

Summing Up

- Our goal should be to get the largest number of children to the highest levels of literacy achievement that we can attain
- An important ingredient in that kind of effort is explicit, systematic instruction in phonemic awareness, phonics, high frequency words, morphology, and text reading fluency
- These efforts should make up no more than 50% of what we teach students in literacy – students also need substantial work on oral language development, reading comprehension, and writing from the beginning (not after some particular foundational skill threshold is accomplished)

Science of Reading – Sound Beginnings

Timothy Shanahan

University of Illinois at Chicago

www.shanahanonliteracy.com