

# The Language Literacy Network

## Implications for SLP Practice



**Speech to Print + Multi-Linguistic + Meta-Linguistic =**  
Making a difference in student outcomes for oral and written language

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### Introduction



**SPELL-Links™**  
PROFESSIONAL DEVELOPMENT

**Jan Wasowicz, Ph.D., CCC-SLP, BCS-CL**  
Speech-language Pathologist  
ASHA Board Certified Specialist – Child Language

Licensed SLP, Illinois; Licensed SLP, Florida  
Professional educator with multiple endorsements from  
State Teacher Certification Board of Illinois

Founder & CEO, Learning By Design, Inc.  
Author, SPELL-Links to Reading & Writing

Inventor, Earobics  
Lead Moderator, SPELTalk

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### Introduction



**SPELL-Links™**  
PROFESSIONAL DEVELOPMENT

**Jan Wasowicz, Ph.D., CCC-SLP, BCS-CL**  
Advisory Board Member, The Reading League Illinois

External Consultant, Purdue University, Interdisciplinary Initiative  
funded by Lilly Foundation Endowment to strengthen teacher  
preparation using science-based methods

Assistant Professor, Department of Speech Communication, Elmhurst  
College (1987-1994)

Visiting Professor, Department of Communication Sciences & Disorders,  
Northwestern University (1991-2003)

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### Disclosures



**SPELL-Links™**  
PROFESSIONAL DEVELOPMENT

**Financial Interests**

Dr. Wasowicz is founder & CEO of Learning By Design, publisher  
of SPELL-Links products and services.

Dr. Wasowicz receives salary from Learning By Design and  
royalties based on sales of SPELL-Links products and services.

Dr. Wasowicz has an ownership interest in the company.

Dr. Wasowicz receives Honoraria or other compensation for  
professional speaking events, including this one.

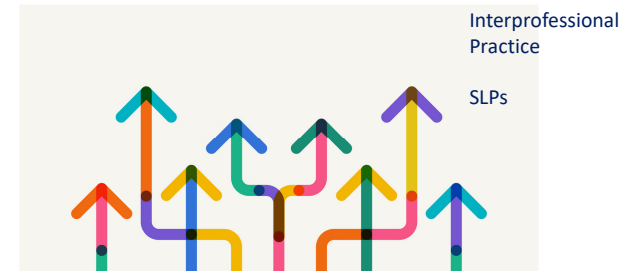
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## What About YOU?



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## Language &amp; Literacy



Literacy Crisis

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## Language &amp; Literacy

"If you're not reading and writing language,  
what *are* you reading and writing?"

Ellen McSpadden, MA CCC-SLP

/spɛltɔk/

SPELLTalk PROFESSIONAL DISCUSSION GROUP

FREE discussion group for researchers, educators,  
and other professionals dedicated to improving  
literacy through discussion of research and  
evidence-based best practices

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## Language &amp; Literacy

"If you're not reading and writing language,  
what *are* you reading and writing?"

Ellen McSpadden, MA CCC-SLP



- ★ Private practice
- ★ School-based practice
- ★ Interprofessional collaborations

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## The Simple View of Reading

## Simple View of Reading

Gough &amp; Turner, 1986, Decoding reading and reading disability. Remedial and Special Education

$$D \times L = RC$$

**Decoding**

Word recognition. The ability to instantly recognize a word.

**Language**

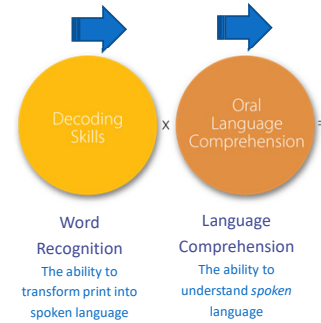
Language comprehension. The ability to understand language structure, etc.

**Reading Comprehension**

The ability to make meaning of connected text.

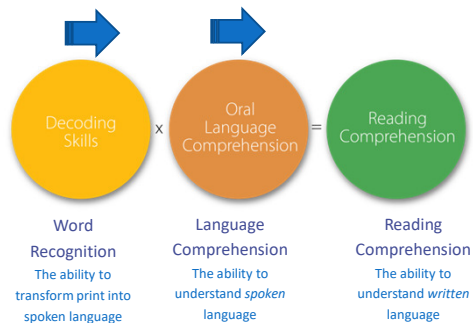
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## The Simple View of Reading



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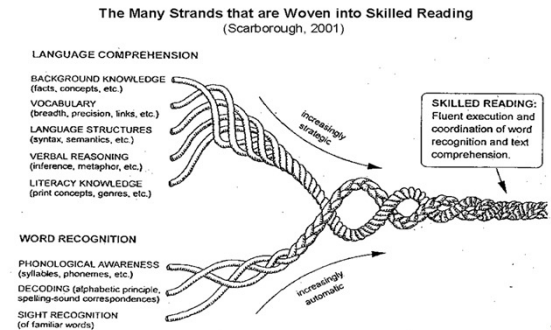
## The Simple View of Reading



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## The Reading Rope

Scarborough, H.S. 2001. Connecting early language and literacy to later reading (disabilities): Evidence, theory, and practice. In S. B. Neuman &amp; D. K. Dickinson, Eds., Handbook of early literacy research, Volume 1, pp. 97-110. New York, NY: Guilford Press.)

SCARBOROUGH'S  
READING ROPE

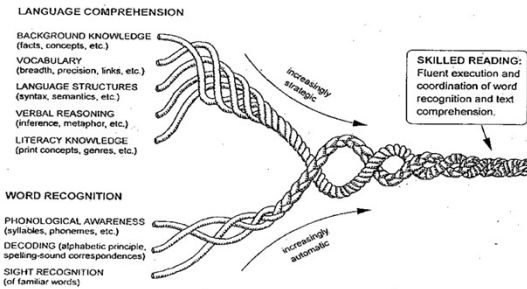
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## The Reading Rope

Scarborough, H.S. 2001. Connecting early language and literacy to later reading (dis)abilities: Evidence, theory, and practice. In S. B. Neuman & D. K. Dickinson, Eds., *Handbook of early literacy research*, Volume 1, pp. 97-110. New York, NY: Guilford Press.

### SCARBOROUGH'S READING ROPE 1992

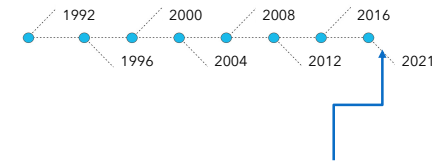
#### The Many Strands that are Woven into Skilled Reading (Scarborough, 2001)



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## The Language Literacy Network

A New Twist on the Reading Rope to Advance Literacy Outcomes



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## The Language Literacy Network

TLLN infographic (Wasowicz, 2021) is offered as a **scholarly advancement** of the Reading Rope (originally hand-drawn in 1992 and later published in 2001). TLLN reflects the **same fundamental body of research** which has withstood the test of time since the Reading Rope was created as a "lit review" by Dr. Hollis Scarborough. TLLN **adds to that understanding based on a collective body of research** since the Reading Rope was created 30 years ago.



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## The Language Literacy Network



1. To provide a **more complete** view of literacy:  
Literacy is not just reading, but also **writing**.



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## The Language Literacy Network



2. To emphasize reading and writing as language processes.  
At its core, reading and writing is language, the comprehension and expression of language in written form.



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## The Language Literacy Network



3. To present a more current view of literacy and specifically with respect to word-level decoding and encoding:
- ★ each is a *multi-linguistic/multi-component* process
  - ★ they share a *reciprocal* relationship
  - ★ advantages are provided by “*speech-to-print*” (encoding) instruction



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## The Language Literacy Network



4. To convey these concepts in an infographic that helps educators to
- ★ think about literacy as reading and writing;
  - ★ wrap their brains around the functional connectivity of many language components in skilled literacy;
  - ★ think about and evaluate their own practices.



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## Infographic



“infographics, in a nutshell, bring together the best of data and visuals to craft a story.”



New research.



New story.

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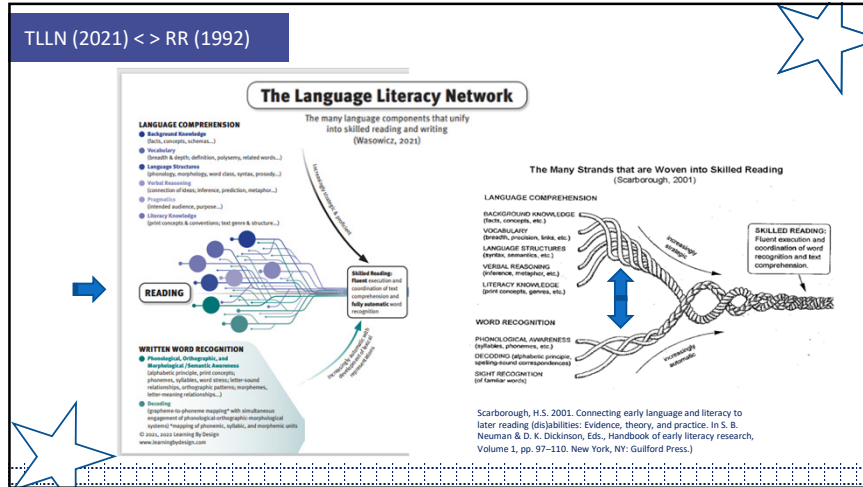
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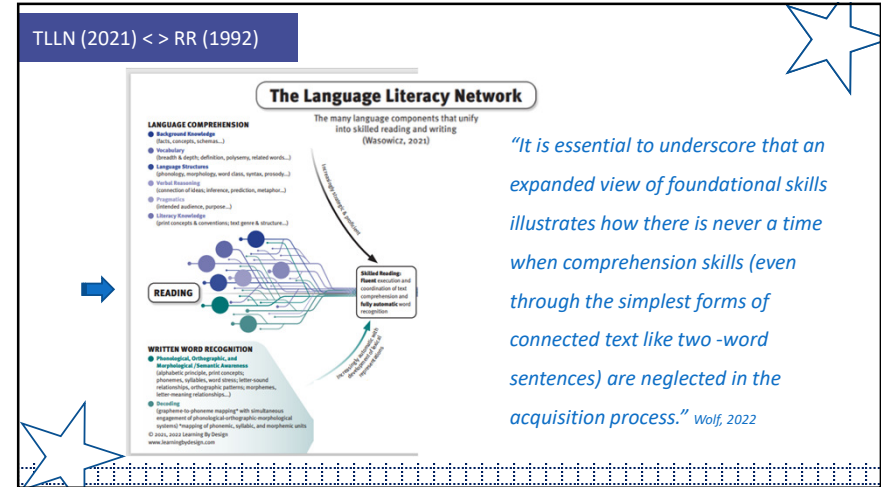
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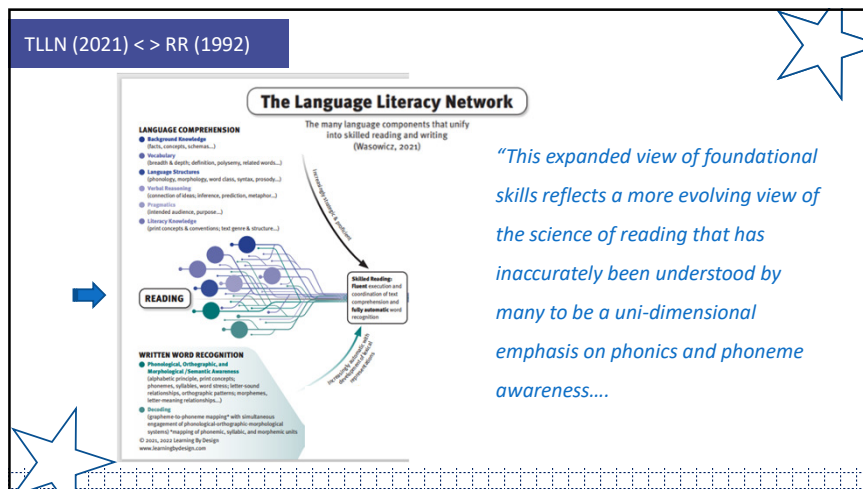




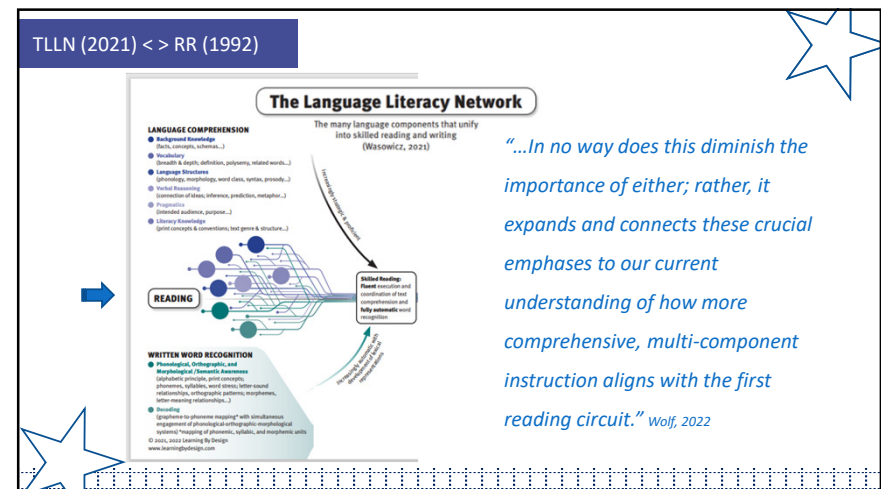
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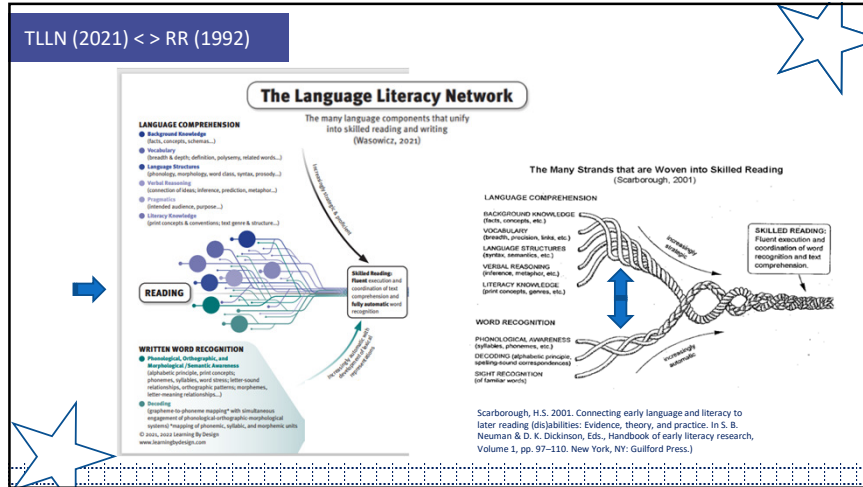
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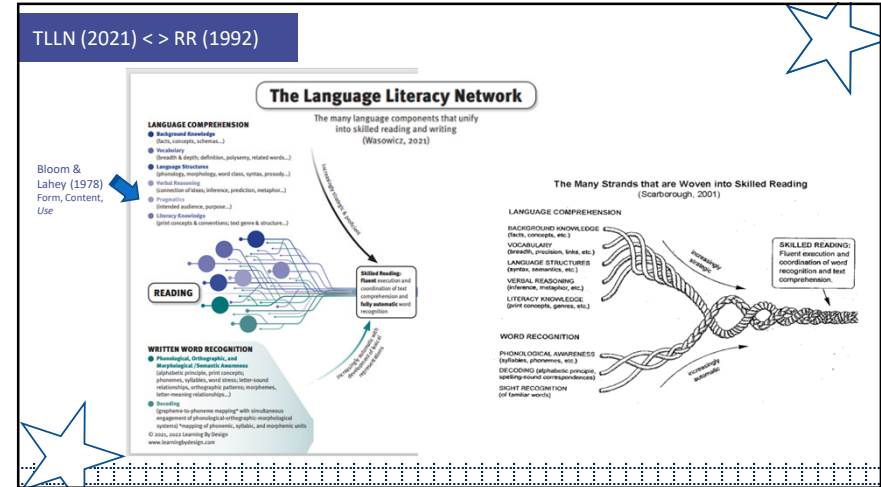
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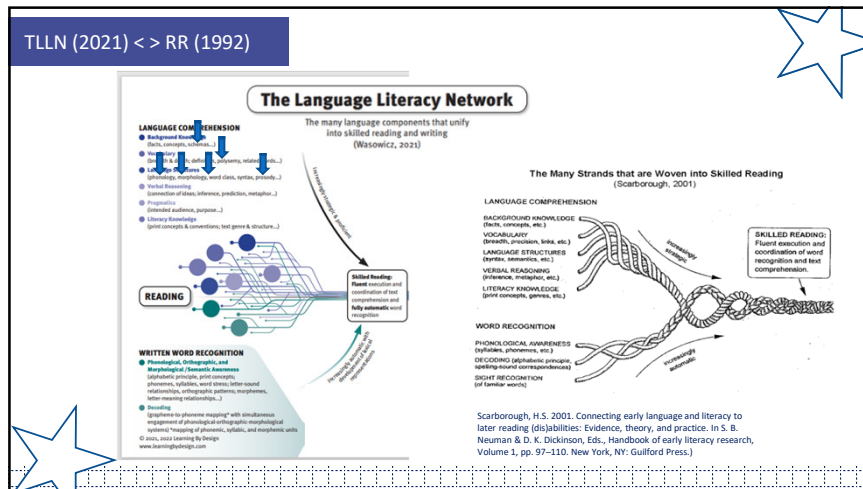
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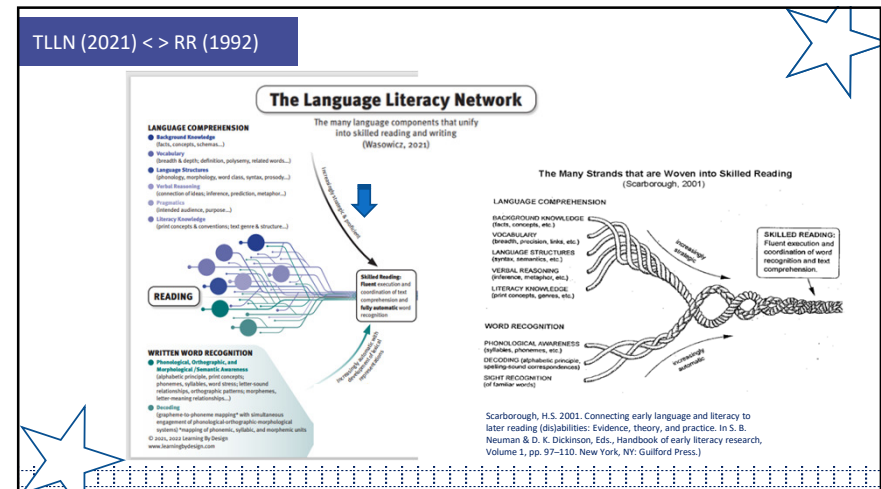
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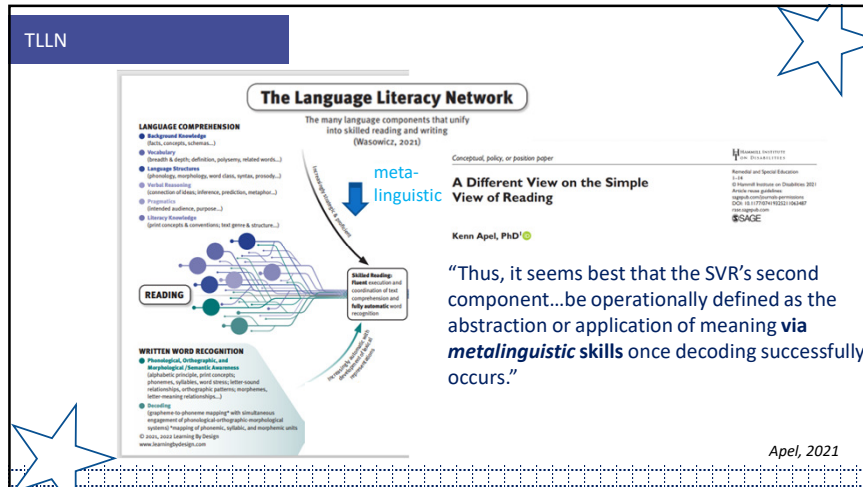


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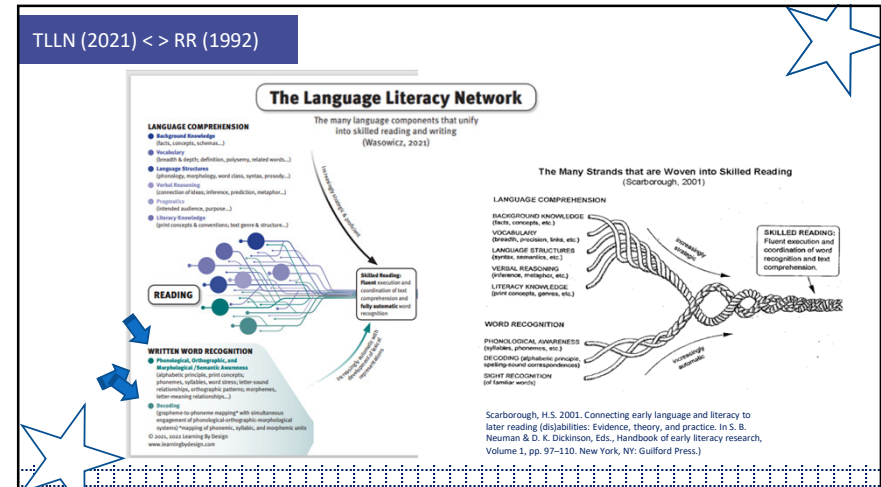


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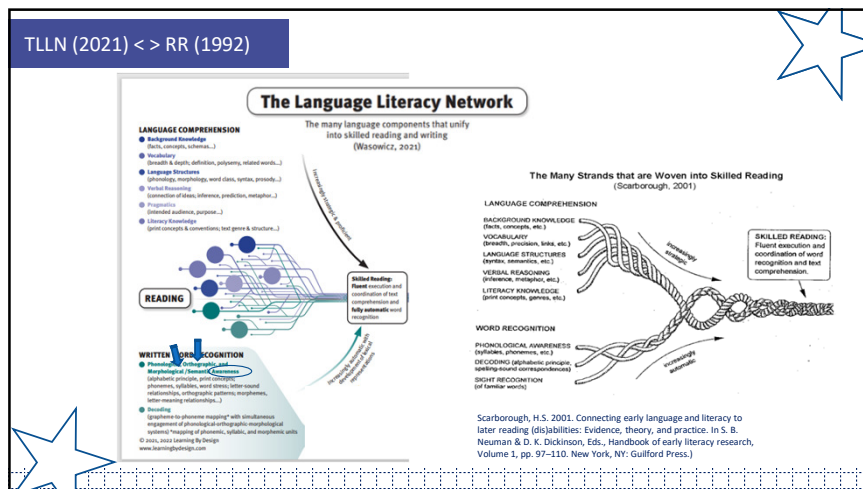




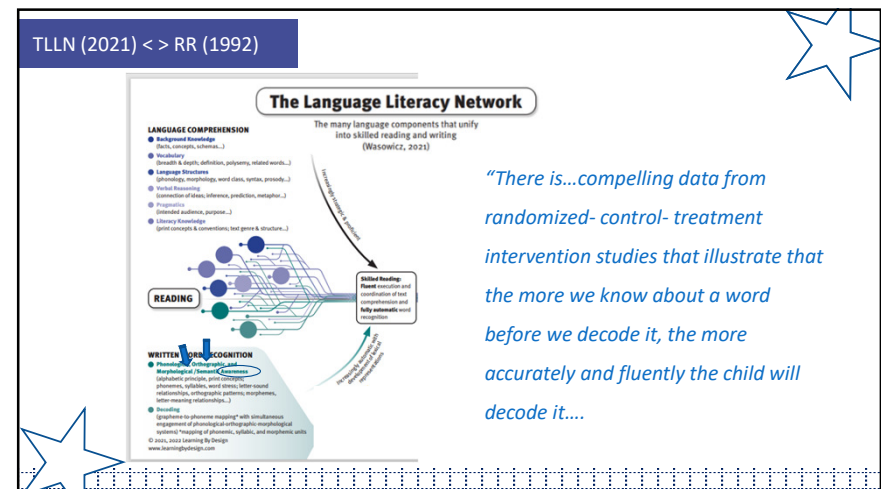
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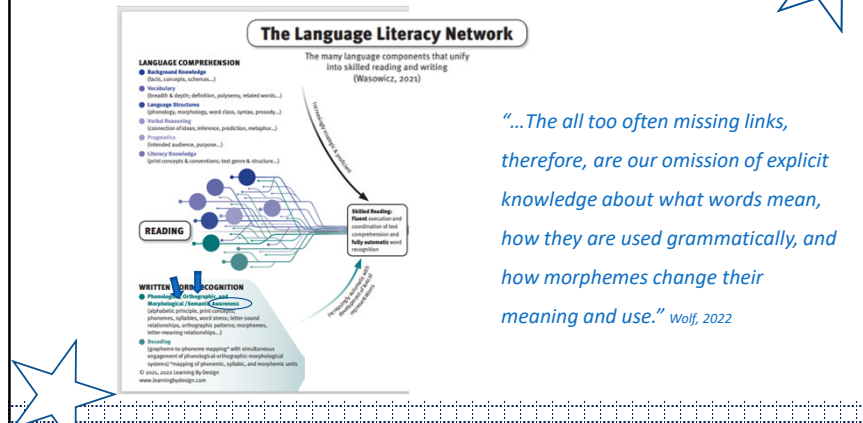


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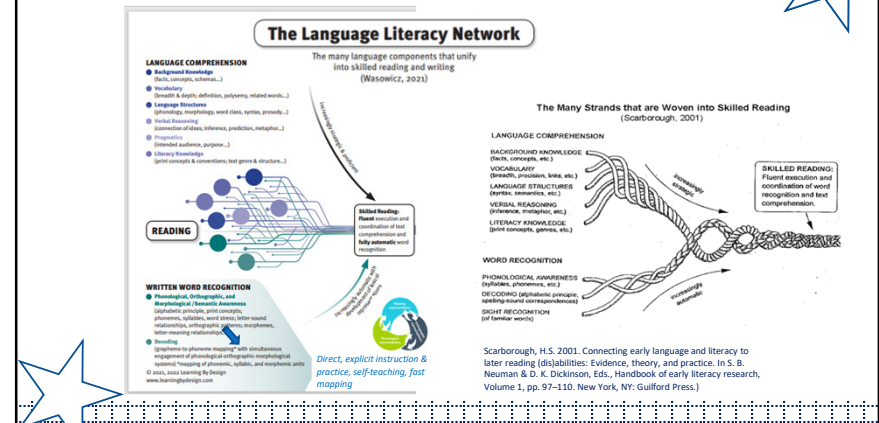
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TLN (2021) &lt; &gt; RR (1992)



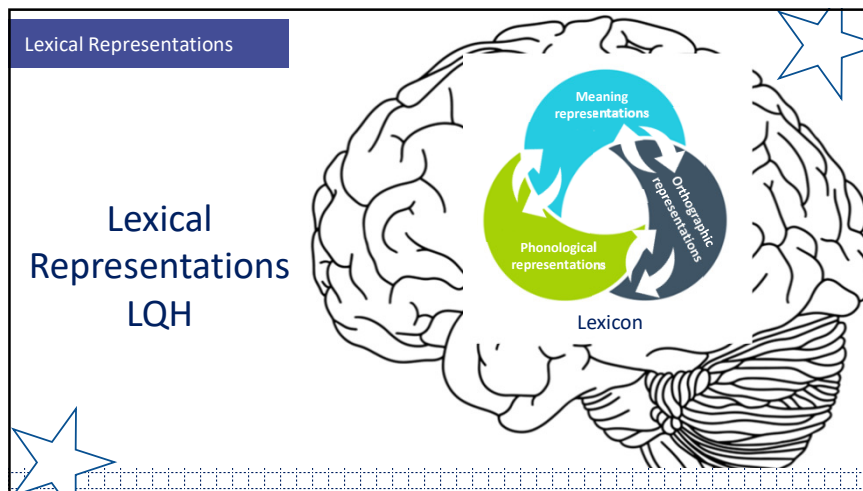
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TLN (2021) &lt; &gt; RR (1992)



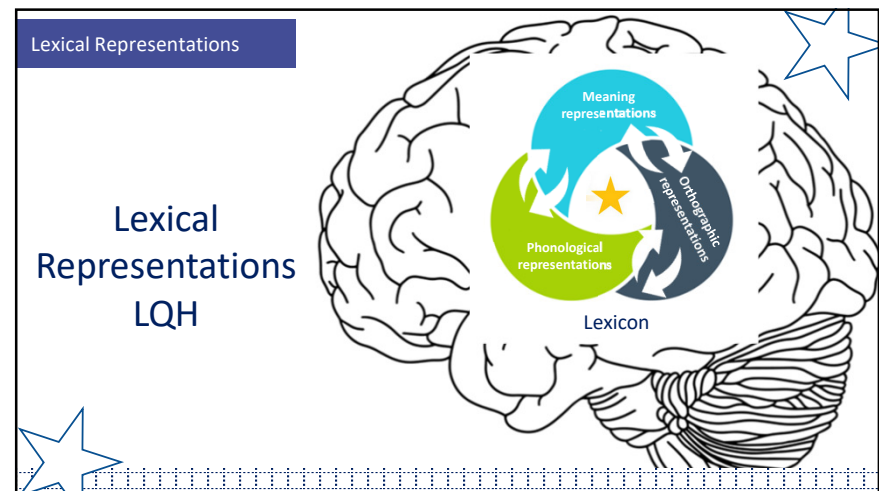
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Lexical Representations



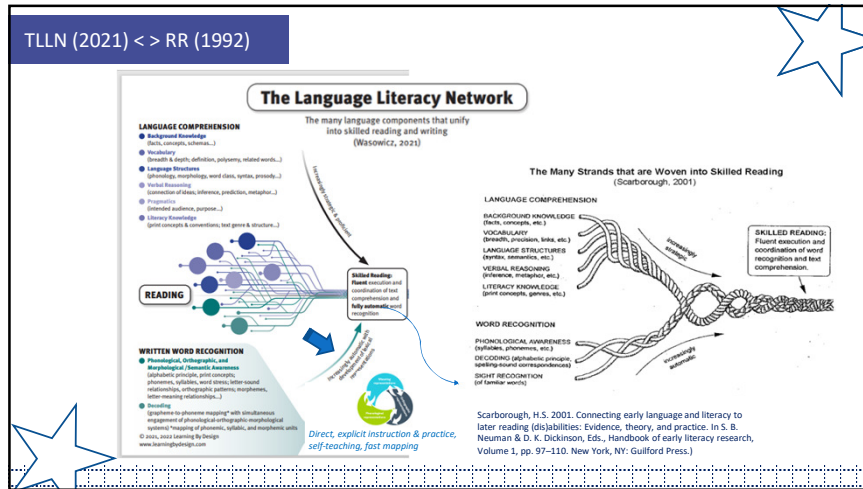
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Lexical Representations



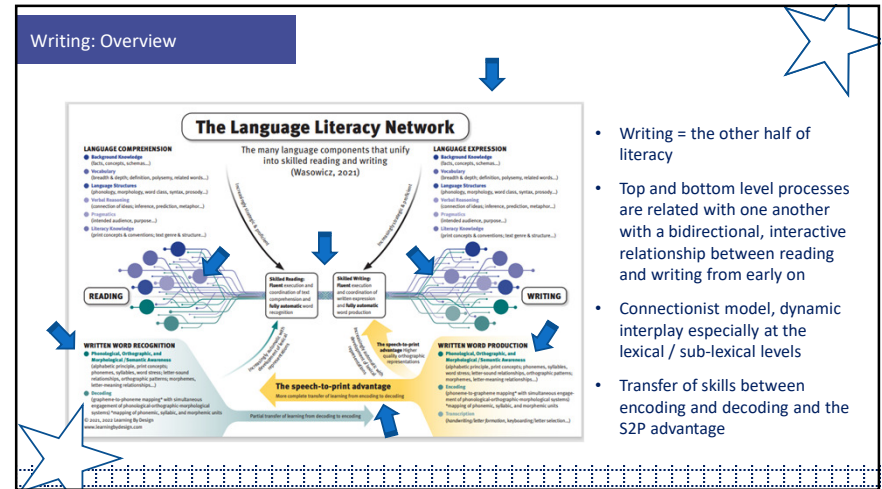
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# TLLN (2021) < > RR (1992)



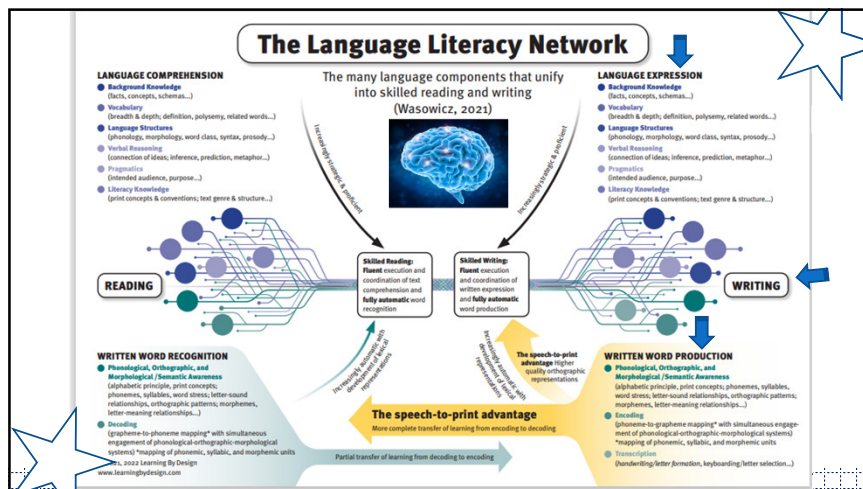
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# Writing: Overview



- Writing = the other half of literacy
- Top and bottom level processes are related with one another with a bidirectional, interactive relationship between reading and writing from early on
- Connectionist model, dynamic interplay especially at the lexical / sub-lexical levels
- Transfer of skills between encoding and decoding and the S2P advantage

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# Reading & Writing

Article

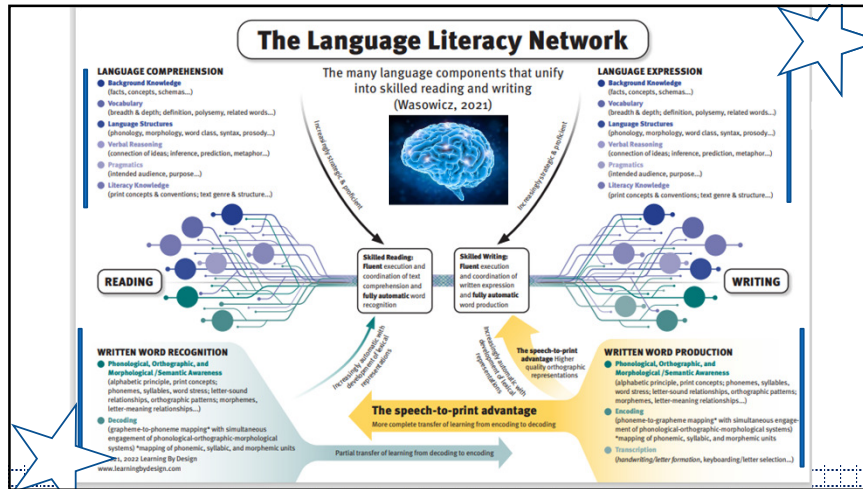
## Co-Occurrence of Reading and Writing Difficulties: The Application of the Interactive Dynamic Literacy Model

Young-Suk Grace Kim, EdD<sup>1</sup>

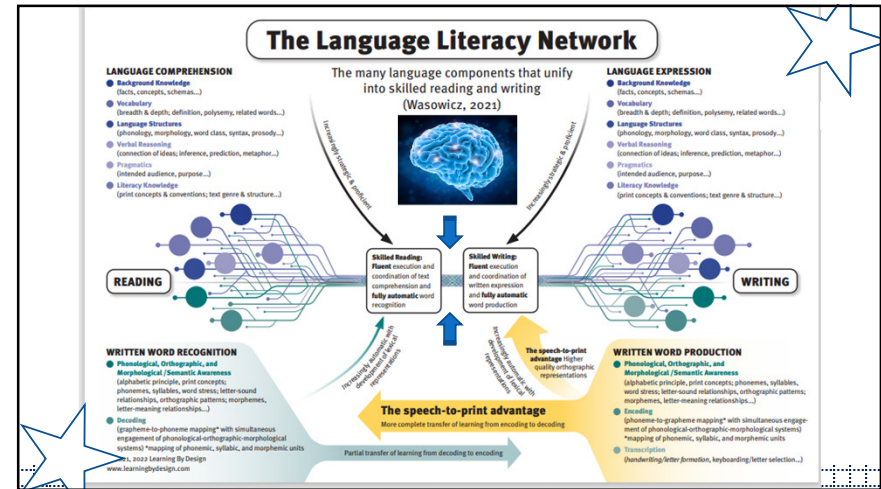
“...reading and writing...draw on largely shared processes and skills as well as unique processes and skills. As such, reading and writing are dissociable but interdependent systems that have hierarchical, interactive, and dynamic relations.

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Journal of Learning Disabilities  
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Reading & Writing

Article

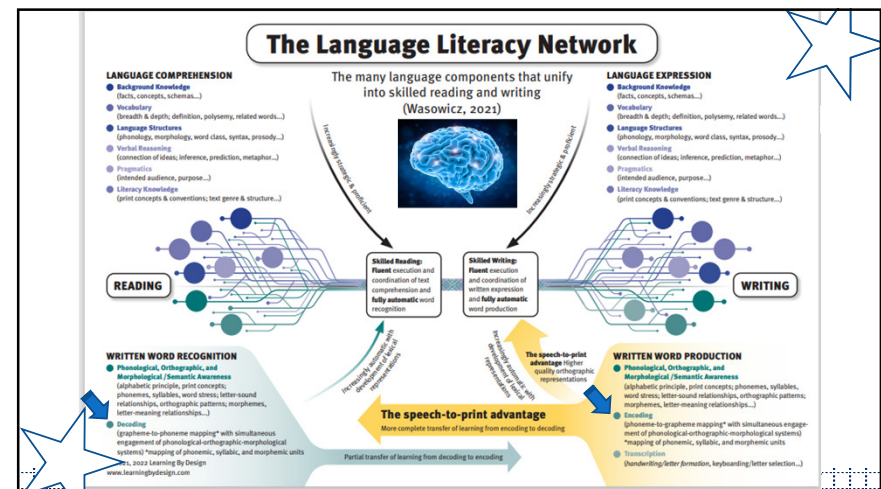
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Journal of Learning Disabilities 1-18  
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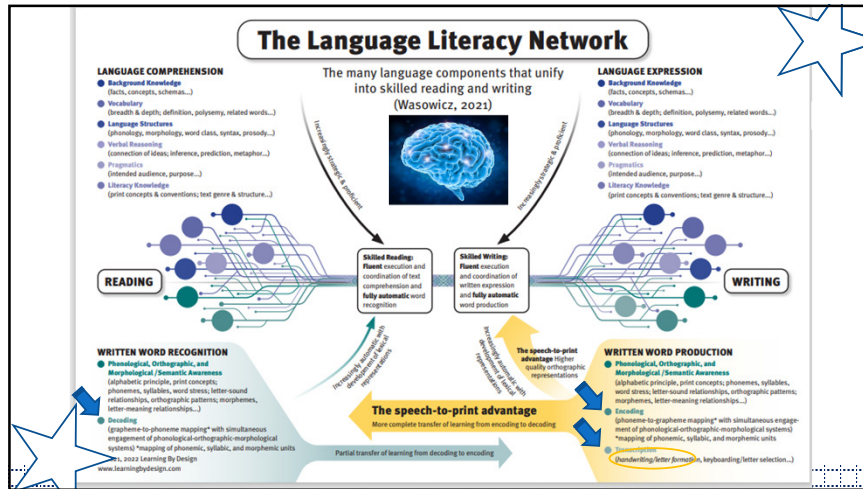
“...The relation (between reading and writing) is stronger at the lexical level—word reading and spelling—than at the discourse level—reading comprehension and written composition.”

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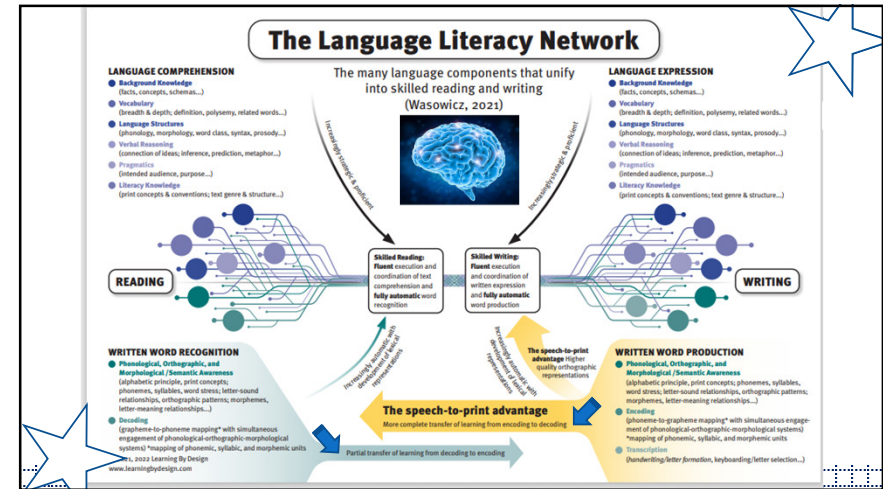


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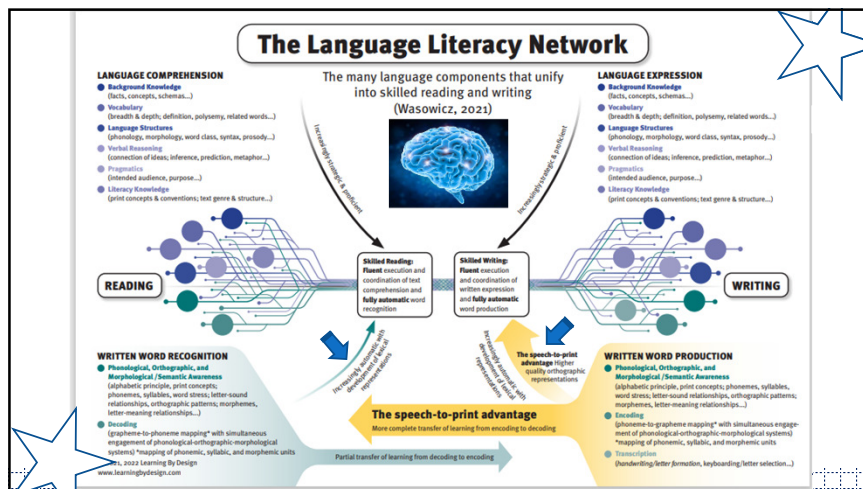




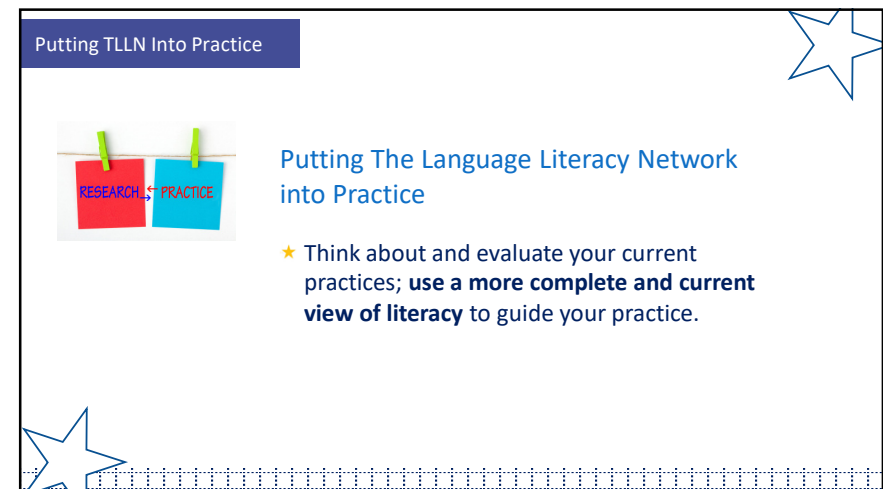
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## Putting TLLN Into Practice

Added, Unique Focus  
of The Language Literacy Network

- ★ Language expression | Writing
- ★ Speech-to-print (S2P) advantage
- ★ Added morphology, prosody, & pragmatics components
- ★ Early integration of lexical/sub-lexical units with each other and with higher language processes | Connectionist Model
- ★ Automatic word recognition is an outcome, not something that is directly taught.
- ★ Graphophonological-Semantic (GPS) cognitive flexibility\*

\*Duke &amp; Cartwright, 2021

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## Putting TLLN Into Practice

Added, Unique Focus  
of The Language Literacy Network

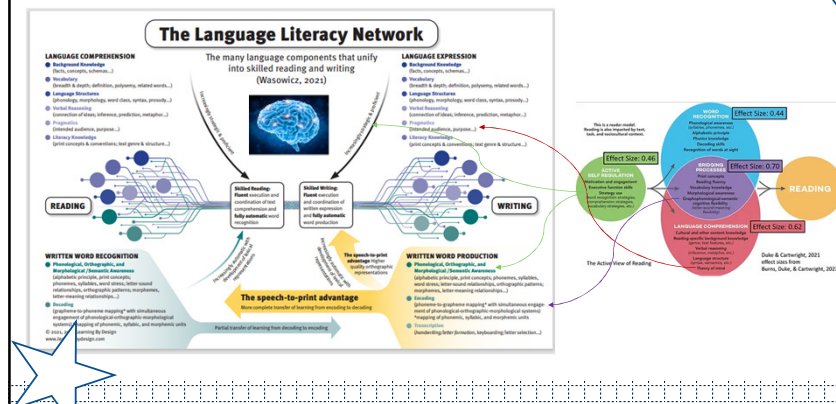
invisible  
"in-vi-si-ble"  
in-visible  
in-vis-ible

- ★ Graphophonological-Semantic (GPS) cognitive flexibility\*  
the ability to simultaneously attend to, and flexibly switch between, the letters and sounds in words (graphophonological) and the meanings of words (semantic). Cognitive flexibility = Executive Function skill.
- ✓ Focus on integrated POM instruction.
- ✓ Explicitly teach how to flexibly think about POM components of a word, important for encoding and decoding, and GSF is positively correlated with reading comprehension.

\*Duke &amp; Cartwright, 2021

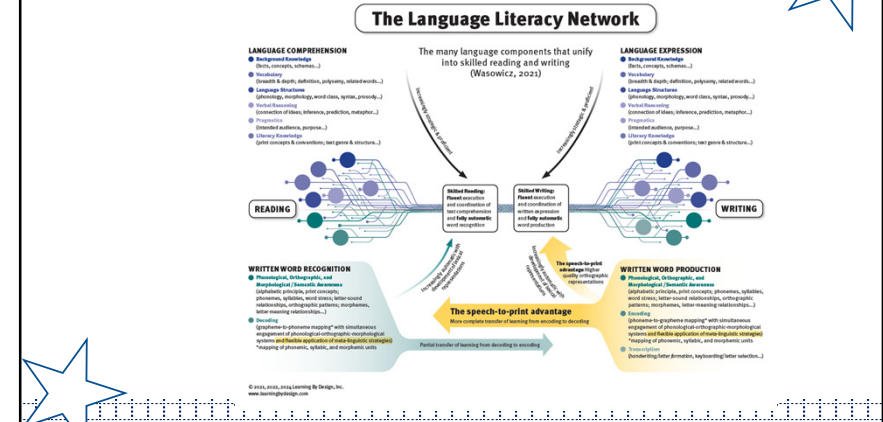
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## The Language Literacy Network



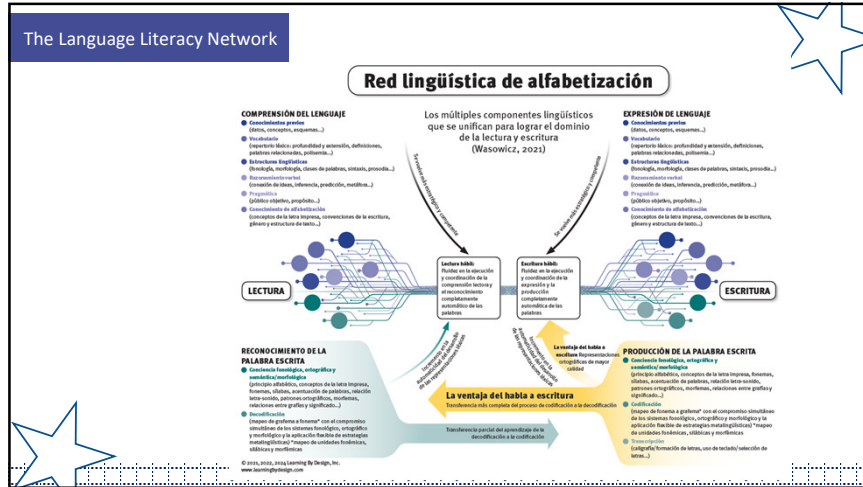
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## The Language Literacy Network

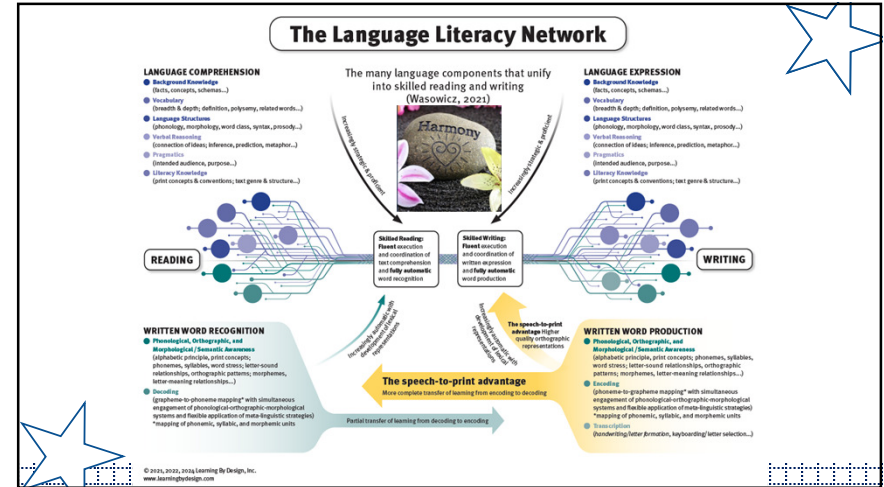


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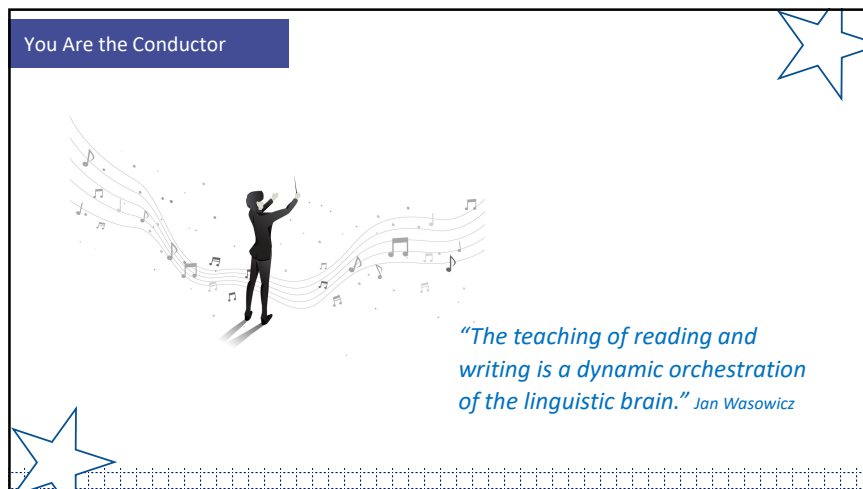




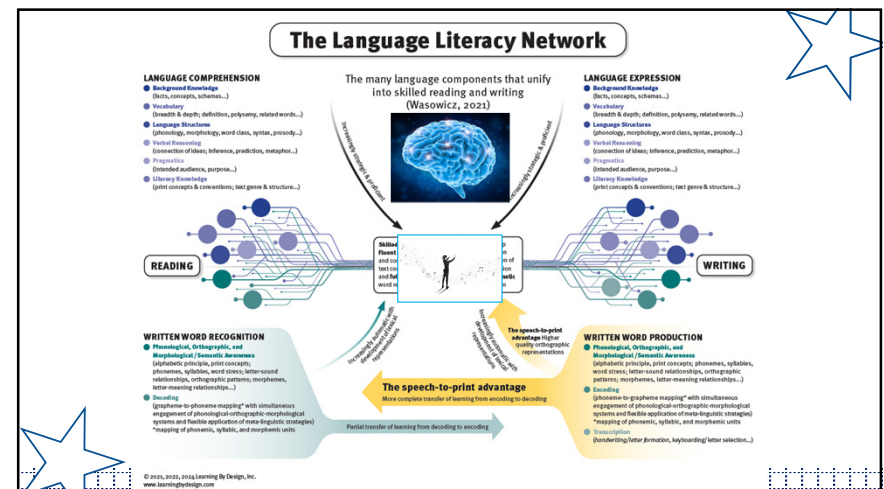
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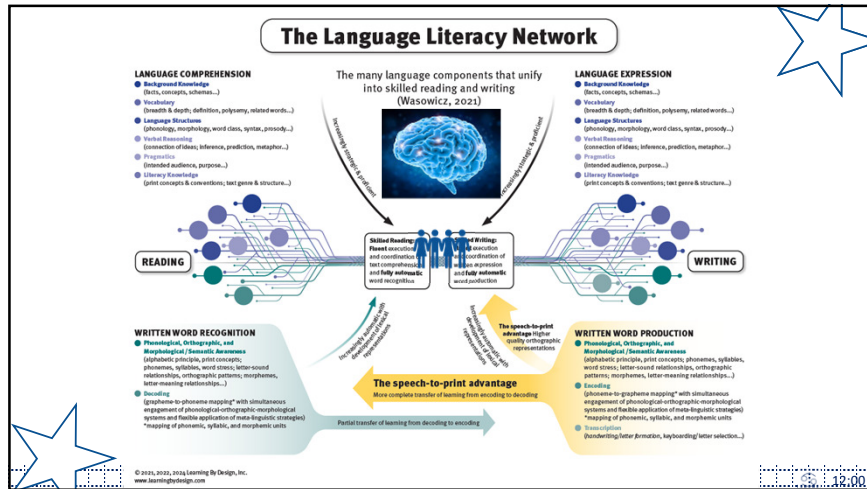
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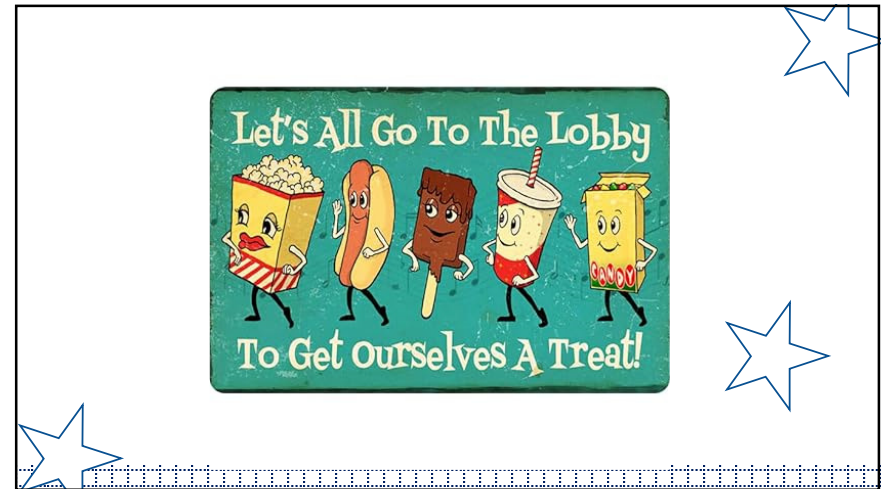
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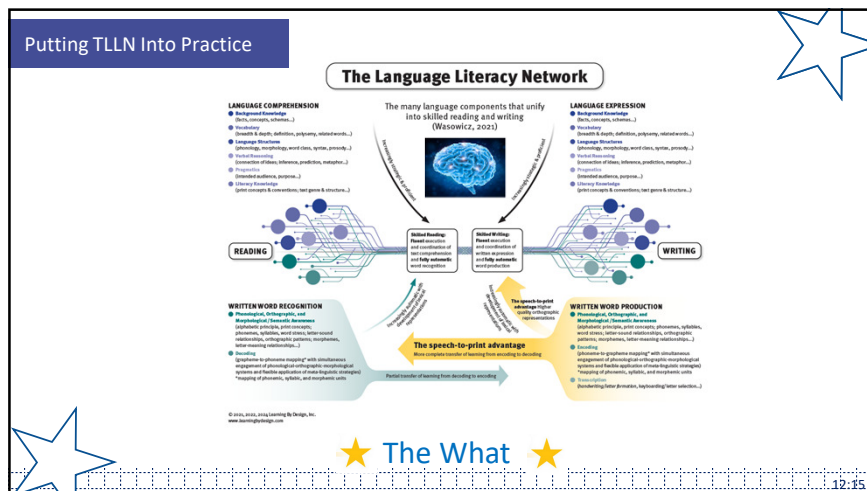
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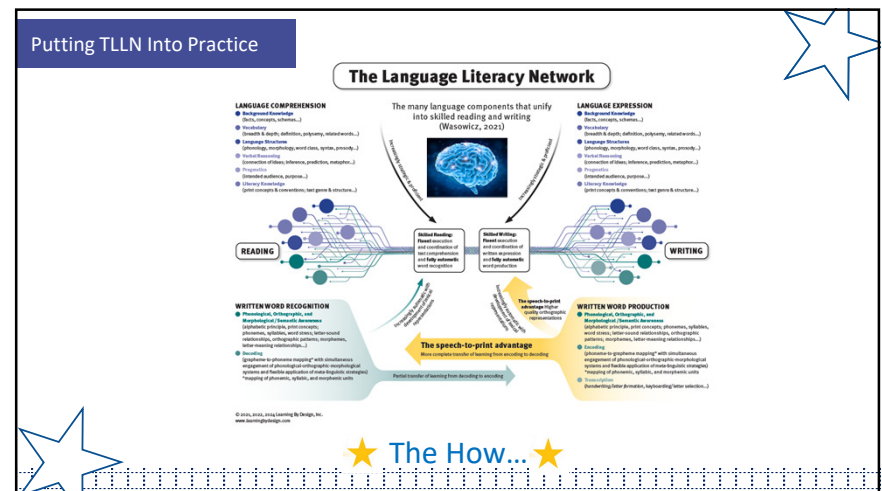
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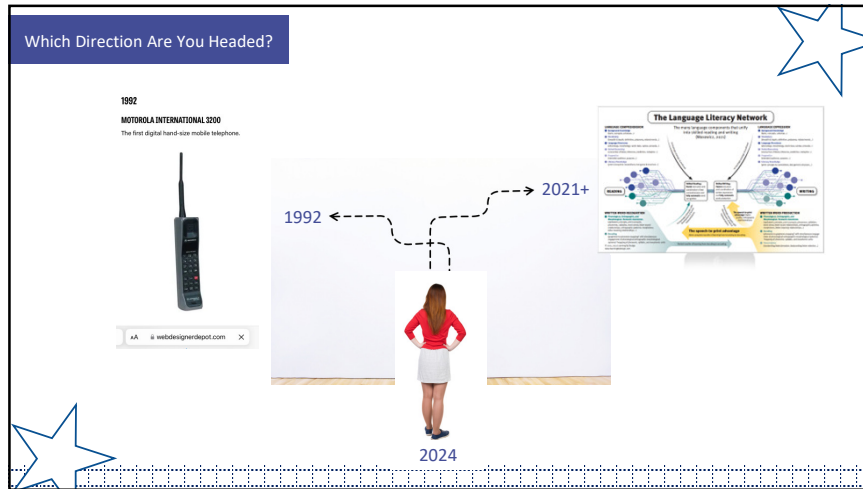
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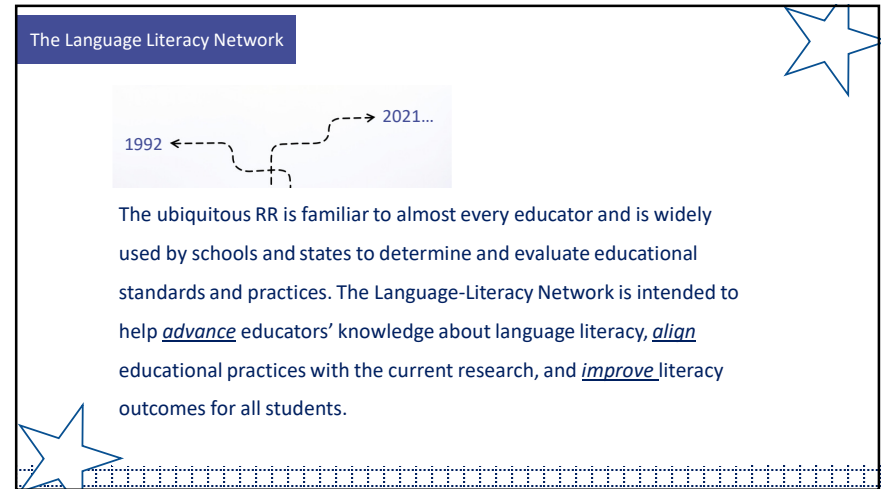
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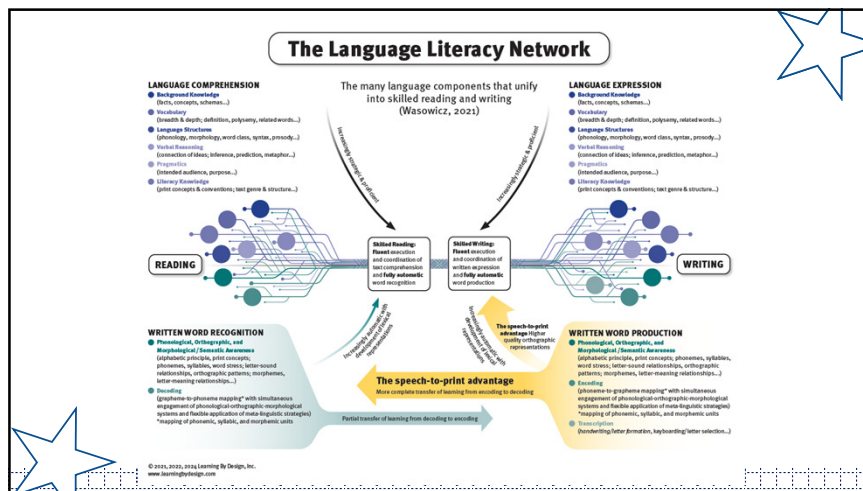
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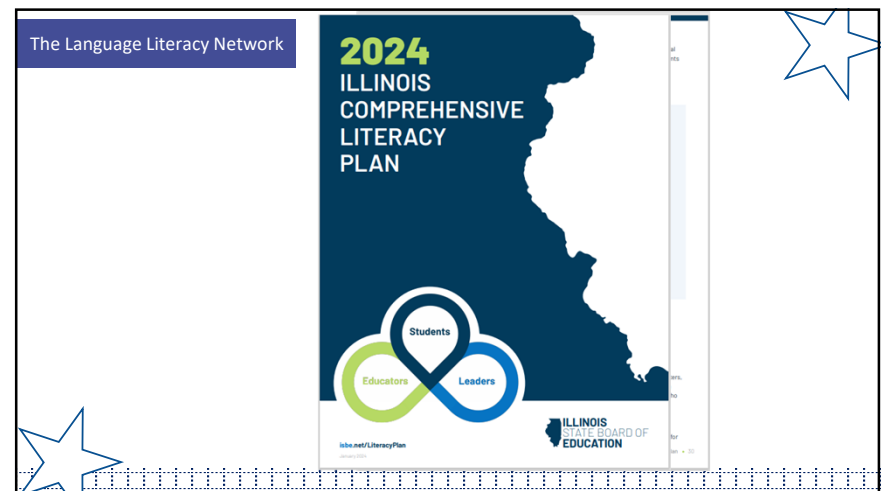
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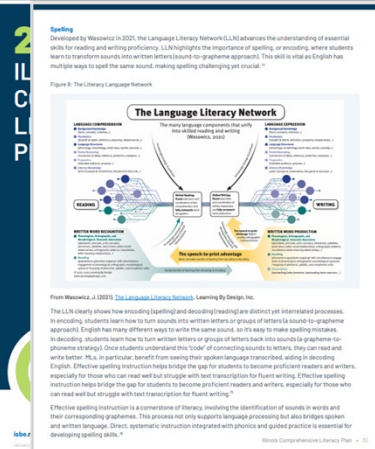


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## The Language Literacy Network



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## Pause to Reflect



**FOR YOU**, what are the clinical implications of the Language Literacy Network?

**FOR YOU**, what implications does the Language Literacy Network have for interprofessional practice?

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## Putting TLLN Into Practice



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## The Power of Speech

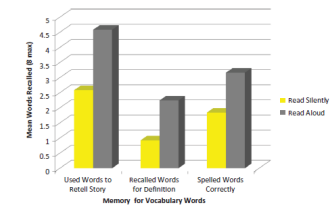


FIGURE 4 Mean vocabulary words produced, recalled and spelled correctly (eight maximum) after fifth graders silently read a passage and either pronounced the underlined vocabulary words aloud or read them silently. Data for this figure extracted from Rosenthal and Ehri (2011). (Color figure available online.)

(Rosenthal & Ehri, 2011)



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## The Power of Orthography

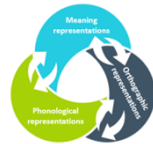


gam



vibrissa

Rosenthal &amp; Ehri (2009)



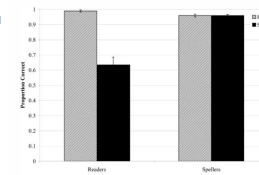
Orthographic Facilitation

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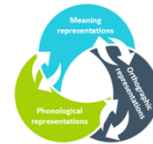
## The Power of Spelling

2nd grade students, 1-week instruction

- Unequal improvement in spelling and reading of practiced words
- Only partial transfer of orthographic knowledge to reading new words

Reading instruction Spelling Instruction  
(Conrad, 2008)

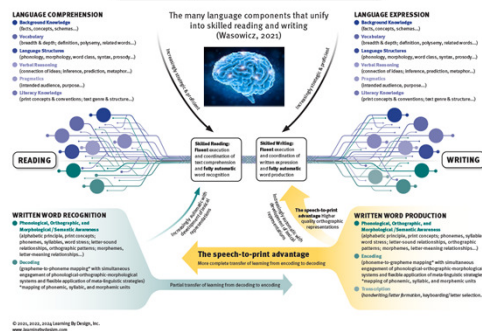
- Equal improvement in spelling and reading of practiced words
- Complete transfer of orthographic knowledge to spelling new words



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## Putting TLLN Into Practice

### The Language Literacy Network



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## PA & SSD Over Time

### Preschool:

- ★ Preschoolers with SSDs are at increased risk for deficits with phonological awareness (Anthony et al., 2011; Bird, Bishop, & Freeman, 1995; Foy & Mann, 2011; Lewis et al., 2011; Lewis & Freebairn, 1992; Peterson, Pennington, Shriberg, & Boada, 2009; Raitano, Pennington, Tunick, Boada, & Shriberg, 2004; Rvachew, Ohberg, Grawburg, & Heyding, 2003)
- ★ Atypical speech sound errors and distortions in preschool are predictive of weak PA skills (Preston & Edwards, 2010)
- ★ This is true even when language is normal (Bird et al., 1995; Overby, Trainin, Smit, Bernthal, & Nelson, 2012; Raitano et al., 2004; Rvachew et al., 2003)
- ★ The proportion of speech sounds in error at age 5 is related to the likelihood of persistent errors at age 8 (Roulstone et al., 2009)

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## PA &amp; SSD Over Time

School-aged:

- ★ Children with persistent speech sound disorders (2-5<sup>th</sup> grade) have markedly weaker PA skills compared to same-age peers (Farquharson, 2012)
- ★ Children with “residual” SSD, ages 8.5-10, exhibit cortical and subcortical differences during phonological processing tasks (Preston, Felsenfeld, Frost, Menci, Fulbright, Grigorenko, Landi, Seki, & Pugh, 2012)
- ★ Atypical speech sound errors in preschool are predictive of school-age PA abilities; if more than 10% of the child’s speech has atypical errors, the child is likely to have deficits in PA, reading, and spelling (Preston & Hull, 2012)

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## PA &amp; SSD Over Time

Adolescents:

- ★ 10 to 14-year-old children with “residual” speech sound errors (no comorbid diagnoses) have weaker phonological processing skills compared to same-aged peers (Preston & Edwards, 2007)
- ★ Phonological processing (word reading and phonological working memory) skills have been shown to be weak even once the speech sound disorder is remediated (Farquharson, 2015; Raitano, Tunick, Pennington, Boda, & Shriberg, 2004)

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## PA &amp; SSD

- ★ Children with speech sound disorders are at risk for reading impairment
  - Sample Study of children getting school-based SSD tx found 25% had comorbid deficits in decoding words (Tambyraja, Farquharson, & Justice, 2020)
  - Those “graduated” from SSD tx without PA instruction are likely to be flagged for reading/spelling impairment later
- ★ Incorporating PA into speech sound treatment can help to bootstrap phonological skills for both speech and reading

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## PA &amp; Age

- ★ PA can and should be taught at any age!
  - Activities can be adapted to use words more appropriate for older children

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### SSD Phono/Ortho Mapping

- ★ Children with speech sound disorders are at risk for reading impairment
- ★ Children with SSD often struggle to make the translation between phonology and orthography (Sutherland & Gillon, 2005)
- ★ Phonological awareness and letter identification in K were predictive of 2<sup>nd</sup> grade reading achievement (Hogan, Catts, & Little, 2005)
- ★ Long-term difficulties even after the sound is remediated (Farquharson, 2015; Felsenfeld et al.)

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### Orthography & SSD

- ★ Phonological and orthographic skill development have a reciprocal relationship
- ★ Incorporating orthography (print) into speech sound treatment can help to bootstrap orthographic skills for reading and spelling

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### Phono/Ortho Mapping

- ★ Exposing children to orthography is a fantastic and powerful linguistic tool
  - *Facilitates learning phonological skills*
- ★ This is appropriate at any age – what you ask of the child will vary based on age
  - Younger children can identify letters and talk about hearing the sounds that different letters and letter patterns make
  - Younger children can trace letters as they say letter names or sounds in written words
  - Older children can write words, sentences, stories

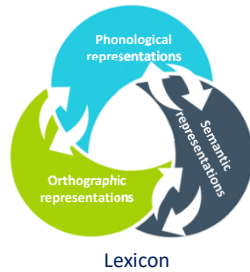
83

### Adding PA + OPA to SSD Tx

- ★ Integrating SSD treatment, PA and orthography can lead to lasting improvements in:
  - speech production
  - phonological awareness
  - reading and spelling accuracy (Gillon, 2000, 2002, 2005; McNeill, Gillon & Dodd, 2009)

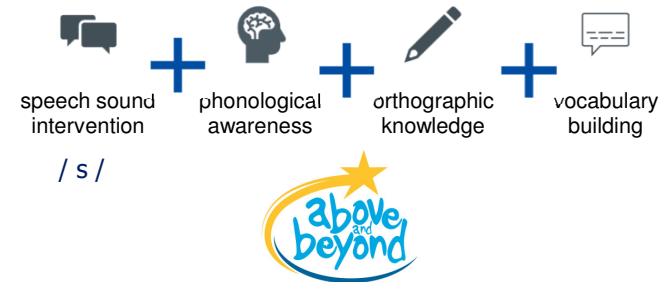
84

## Phono/Ortho Representations



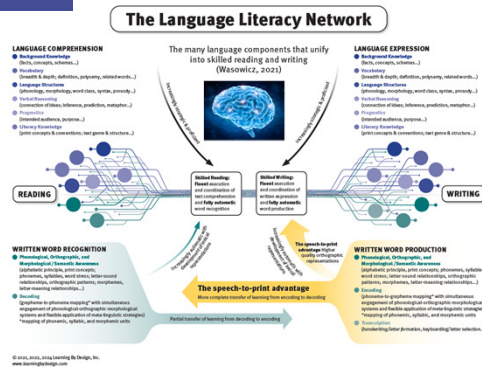
85

## Adding PA + OPA to SSD Tx



86

## Putting TLLN Into Practice



87

## Sample PA Activities

## ★ PA Skill – Count words in spoken pattern-loaded sentences:

- “The bus will pass close to this place.”
- “Stop before you step on the small snake.”



88

## Sample PA Activities

★ **PA Skill** – Count words in spoken pattern-loaded sentences:

- “The bus will pass close to this place.”
- “Stop before you step on the small snake.”



89

## OPA Extension

★ **OPA Skill** – Identify spelling of target sound(s)

- “The **bus** will **pass** **close** to **this** **place**.”
- “**Stop** before you **step** on the **small** **snake**.”

90

## OPA Extension

★ **OPA Skill** – Identify spelling of target sound(s)

- “The **bus** will **pass** **close** to **this** **place**.”
- “**Stop** before you **step** on the **small** **snake**.”

91

## Sample PA Activities

★ **PA Skill** – Blend individual phonemes into words

- Use visuals (e.g., Key Word Picture Cards) to scaffold

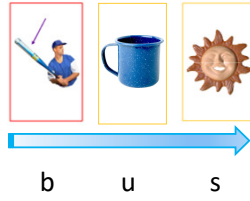
★ **PA Skill** – Segment words into individual phonemes



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## OPA Extension

★ **OPA Skill** – Point to letter(s) / underline letters as blending phonemes



93

## Sample PA + SEM Activities

★ **SEM Skill** – Sort words based on parts of speech

Nouns	Verbs	Adjectives	Pronoun
bus*	bus*	this*	this*
place*	place*	nice	
pass*	pass*	close	
dress*	dress*		
guess*	guess*		
class	miss		
house	toss		

94

## Sample PA + MK Activities

★ **MK Skill** – Add inflectional suffixes and identify changes

Verbs	-s / -es	-ing	-ed	change?
bus	busses	bussing	bussed	doubled 's'
place	places	placing	placed	drop 'e'
pass	passes	passing	passed	n/a
dress	dresses	dressing	dressed	n/a
guess	guesses	guessing	guessed	n/a
miss	misses	missing	missed	n/a
toss	tosses	tossing	tossed	n/a

95

## Sample PA + SEM Activities

★ **SEM Skill** – Sort words based on category and add

- bus (**transportation/vehicle**) ... car, bicycle, scooter, skateboard
- dress (**clothes**) ... skirt, shorts, pants, coat
- snake (**reptile**) ... lizard, gecko, turtle
- school, store (**building**) ... house, hospital, skyscraper

★ **SEM Skill** – Define words (category + distinctive feature/function)

- bus: a long vehicle with 12 or more seats for people (usually pay)
- snake: a reptile with a long thin body and no legs

96

Pause to Reflect



97

*inspect*  
*prospect*  
*inspection*  
*spectator*  
*prospector*  
*disrespectful*  
*spectacularly*

- ★ Phonological awareness
  - ★ Syllables, syllabic stress
- ★ Phoneme-grapheme mapping
  - ★ At the syllable level
- ★ Oral expression / Syntax
- ★ Parts of speech
- ★ Morphology
- ★ Vocabulary development
  - ★ Polysemy, depth, breadth
- ★ Background knowledge
- ★ Verbal reasoning; Cognitive flexibility
- ★ Leveraging S2P & Reading



98

*inspect*  
*prospect*  
*inspection*  
*spectator*  
*prospector*  
*disrespectful*  
*spectacularly*

2	3	4	5



99

*inspect*  
*prospect*  
*inspection*  
*spectator*  
*prospector*  
*disrespectful*  
*spectacularly*


2	3	4	5
<i>inspect</i> <i>prospect</i>	<i>inspection</i> <i>spectator</i> <i>prospector</i>	<i>disrespectful</i> <i>l</i>	<i>spectacularly</i>



100

inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly


1'	2'	3'	4'



101

inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly

1'	2'	3'	4'
prospect prospector spectator	inspect inspection spectacularly	disrespectful	




ə

102

inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly


N	V	ADJ	ADV



103

inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly

N	V	ADJ	ADV
inspection spectator prospect prospector	prospect	disrespectful	spectacularly



104







inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly





105


inspection "The act of watching/looking into something"


in look, watch N

in	spect	ion			
Prefix	Prefix	Base Word or Word Root	Suffix	Suffix	Suffix

Be Smart About Word Parts



106






**Build on the Base & Invite the Relatives**

Write the first letter of a base word or word root in the box below the arrow. Write the remaining letters in the boxes to the right, placing just one letter in each box.



Write word relatives in the rows below, always placing the first letter of the base or root portion of the relative below the first letter of the base or root in the first row.

Add prefixes by writing letters in the boxes to the left of the first letter. Add suffixes by writing letters in the boxes to the right of the last letter. Use all the letters of the word root or base word unless you can identify a specific reason (for example, a spelling rule) for changing the spelling of the base or root.

107

inspect  
prospect  
inspection  
spectator  
prospector  
disrespectful  
spectacularly

- ★ Phonological awareness
  - ★ Syllables, syllabic stress
- ★ Phoneme-grapheme mapping
  - ★ At the syllable level
- ★ Oral expression / Syntax
- ★ Parts of speech
- ★ Morphology
- ★ Vocabulary development
  - ★ Polysemy, depth, breadth
- ★ Background knowledge
- ★ Verbal reasoning; Cognitive flexibility
- ★ Leveraging S2P & Reading

108

Pause to Reflect



109

Q&A / Continue the Learning...



/spɛltɔk/

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and other professionals dedicated to improving  
literacy through discussion of research and  
evidence-based best practices



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