Expanding the Science of Reading for Multilingual Learners: A Systematic Review of Systematic Reviews
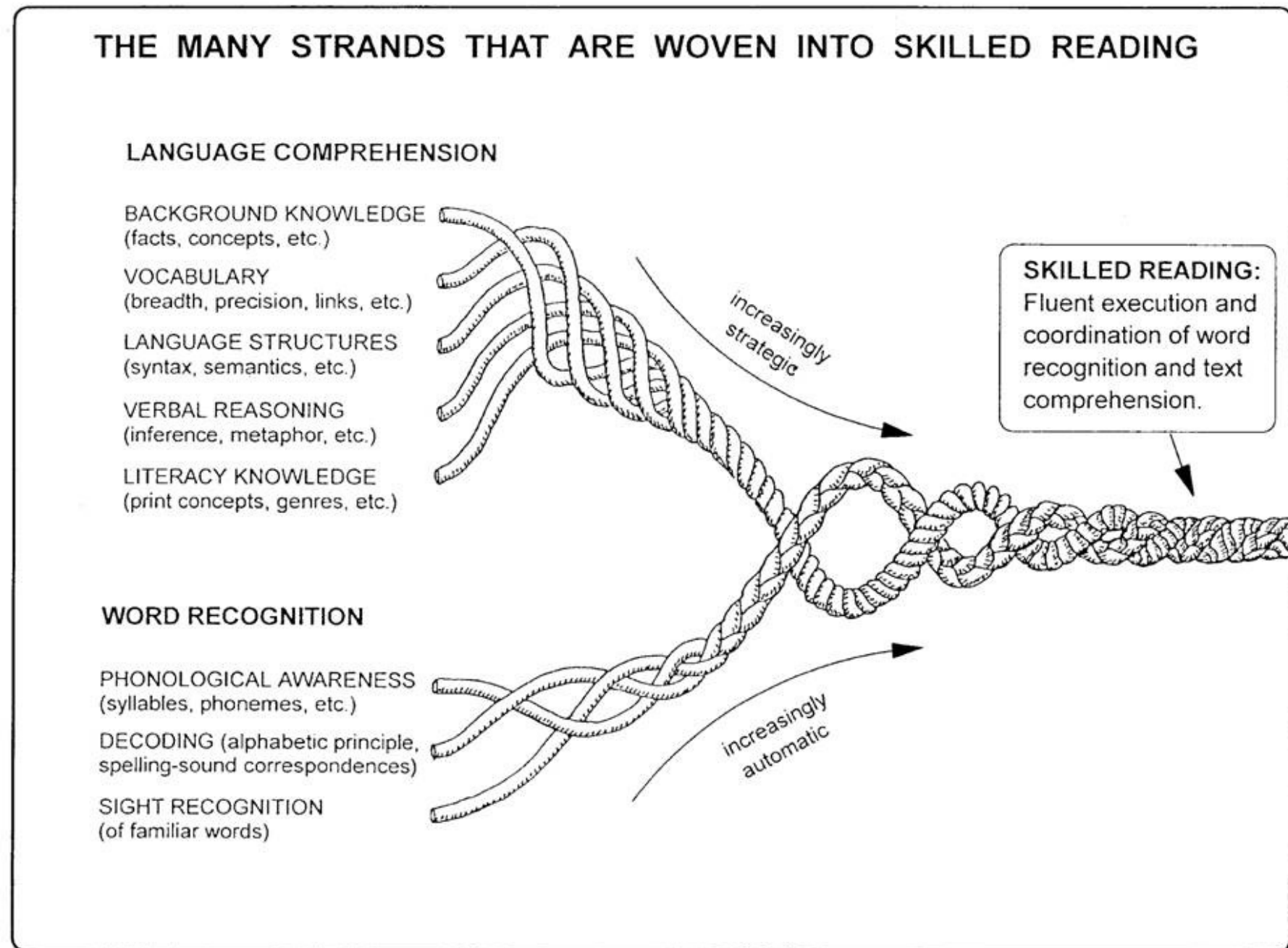
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Introduction

- The *science of reading* (SoR) refers to the sum of what we know about how people learn to read based on empirical studies across multiple disciplines (e.g., cognitive science, neuroscience, psychology, and linguistics; Gewertz, 2020; Hurford, 2020; Seidenberg et al., 2020).

- In current discourse, the SoR has been used by a movement of educators, reformers, researchers, and policy makers to argue that explicit phonics instruction is key to the development of one's literacy skills (Shanahan, 2020).

- A focus on structured literacy instruction de-emphasizes vital aspects of language and literacy research and instruction needed to support multilingual learners (Goldenberg, 2020).

  - For example, the narrow conception of SoR ignores a substantial body of research on cross-language transfer (e.g., Relyea & Amendum, 2020; Prevoo et al., 2016; Proctor et al., 2010) and how multilingual students' native language and literacy skills facilitate learning in their new language.

- Crucially, the role of language comprehension is often minimized in SoR principles and within structured literacy instruction even though language comprehension is featured prominently in both the Simple View of Reading (Gough & Tunmer, 1986) and the Reading Rope (below; Scarborough, 2001).

THE MANY STRANDS THAT ARE WOVEN INTO SKILLED READING

LANGUAGE COMPREHENSION
- BACKGROUND KNOWLEDGE (facts, concepts, etc.)
- VOCABULARY (breadth, precision, links, etc.)
- LANGUAGE STRUCTURES (syntax, semantics, etc.)
- VERBAL REASONING (inference, metaphor, etc.)
- LITERACY KNOWLEDGE (print concepts, genres, etc.)

WORD RECOGNITION
- PHONOLOGICAL AWARENESS (syllables, phonemes, etc.)
- DECODING (alphabetic principle, spelling-sound correspondences)
- SIGHT RECOGNITION (of familiar words)

SKILLED READING: Fluent execution and coordination of word recognition and text comprehension.

- In addition, multilingual learners (MLs; often referred to as *English learners* or *English language learners*), on average, approximate their English-only peers' word recognition skills over time (Fitzgerald et al., 2008), but tend to have persistent differences in aspects of language comprehension such as vocabulary (August et al., 2005) and comprehension (National Center for Education Statistics, 2020).

Purpose & Research Question

The purpose of this study is to conduct a systematic review of systematic reviews (Newman & Gough, 2020) published since 2000 about the SoR for MLs.

- RQ1: What are the essential components that make up the SoR for MLs?

- RQ2: What instructional practices, programs, and interventions are effective for addressing each essential component of the SoR for MLs?

Search Methods/Data Sources

Search Strategy
A comprehensive process was used to systematically review literature related to the SoR and SoR instruction for MLs in K-5 U. S. public schools.
1. Inclusion criteria were developed to identify documents for inclusion in the review sample.
2. Key terms were developed to search for documents.
3. Databases were identified for the search
4. The search was conducted to identify documents for inclusion and a reference search in the form of citation and bibliography searches was conducted for each inclusion document.

Inclusion Criteria
- Documents had to be journal articles, technical reports, books chapters, and books published between 2000-2021 and written in English.
- Documents had to be systematic evidence-based reviews (i.e., the authors had to explicitly state how the research documents were identified and reviewed) of reading and reading instruction studies with MLs.
- Reviews had to include studies conducted in U. S. schools in grades K-5.

Search Terms and Databases
- Three databases (i.e., ERIC, APA PsycInfo, and Education Source) from two disciplines (education, psychology) were searched. Key terms were constructed based on three concepts: (1) focus, (2) population, and (3) setting. The following key terms were used in all databases:

  Focus
     Reading AND words related to systematic reviews (e.g., meta-analysis)

  Population
     A comprehensive list of key terms that have historically been used in the literature to describe MLs

  Setting
     Elementary grade levels listed individually along with...OR "elementary" OR "primary"

Procedures

Document Search Procedure

- Searches were conducted by one of the authors and yielded 1,051 documents. After excluding 139 duplicates, one author screened the remaining 912 documents' title and abstract to determine eligibility and excluded 789 documents. Then, the remaining 123 documents were sought for retrieval. One author reviewed the full-text of the remaining documents to determine eligibility and excluded 100 documents. The following reasons for exclusion were applied:

  (1) Is not a review of the research

  (2) Does not explicitly state how the authors identified and reviewed the documents

  (3) Is a systematic review of systematic reviews

  (4) Is not U.S. or K-5 focused

  (5) Does not focus on MLs

  (6) Does not include reading components or instructional practices

- This yielded 23 documents that met all inclusion criteria.

- Then, citation and bibliography searches were conducted with all included documents identifying an additional 15 documents that met all inclusion criteria for a total of 38 documents in the for the final analysis.

Data Extraction

- The authors extracted relevant findings related to the essential components that make up the SoR for MLs and the practices, programs, and interventions that have been found to be effective related to these components for MLs by using the following steps:

  1) The authors read and double-coded 8 of the documents, representing over 20% of the total documents in order to come to an agreement on how to code each document,

  2) Two of the authors each coded 4 of the remaining documents, and

  3) One author coded the remaining documents independently.

Results/Conclusions

- Analysis is ongoing. Similar to SoR components for English-speaking students, the findings from the analysis of the systematic reviews identified five broad clusters in which essential components make up the SoR for MLs:
  (1) Oral language
  (2) Phonological/phonemic awareness
  (3) Word recognition and fluency
  (4) Writing
  (5) Comprehension

- We also identified subcomponents for each component. For example:
  (1) Oral language
     - English oral language
     - English vocabulary knowledge
     - L1 oral language
     - L1 vocabulary knowledge
  (2) Phonological/phonemic awareness
     - English phonemic awareness
     - English phonological awareness
     - L1 phonological awareness

- Many of the SoR components identified from the reviews were accompanied by effective instructional practices. Other reviews focused exclusively on effective instructional practices for each component. For example:
  (1) Oral language
     - Specialized instruction oral language instruction focused on components of oral language
     - Vocabulary strategies such as direct instruction in word meanings, use of word learning strategies (e.g., looking for prefixes and root words), use of carefully selected texts, and instruction in cognates and false cognates

Discussion

- Findings indicate that some essential components for the SoR and reading instruction for MLs are consistent with current SoR conceptualizations such as systematic and explicit instruction in phonemic awareness and phonics.

- However, the SoR would benefit from considering the vast body of knowledge that exists surrounding how MLs learn to read and how educators provide effective reading instruction, programs, and interventions for them.