

# THE SCIENCE OF READING

## The Research and Evidence Basis of CAPIT Reading

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### PART 1: CONTENT

#### The Research We Utilized to Determine the Program's *Content*

##### 1. THE SIMPLE VIEW OF READING: DECODING

###### THE RESEARCH

[Decoding, Reading, and Reading Disability, Philip B. Gough and William E. Tunmer, 1986](#)

[The Simple View of Reading, Hoover, W. A., & Gough, P. B. \(1990\)](#)

The Simple View of Reading (SVR) posits that both Decoding and Linguistic Comprehension play an indispensable role in Reading Comprehension.

The Simple View of Reading is predicated on a simple fact: writing systems were invented to convey language, not meaning. Letters on a page are a kind of transducer that converts speech sounds, such as phonemes, into visual symbols, and vice versa (D=Decoding). The meaning (C=Comprehension) is supplied entirely by the reader.

###### THE APPLICATION OF THE RESEARCH

The Simple View of Reading posits that only Decoding can transform visual symbols into speech. CAPIT is primarily a “Decoding” program. CAPIT does not expect children to read by relying on “Meaning” or “Comprehension.” CAPIT teaches students how to decode.

When deliberating which words to use in our program, we opted for words we believed to be in the children’s vocabulary. CAPIT always employs real words and never nonsense words. In CAPIT, students need to attend mainly to the “Decoding” aspect of reading. The reader supplies the “comprehension” component.

So Decoding is critical, but how should teachers teach Decoding?

##### 2. PHONICS

###### THE RESEARCH

[National Reading Panel, 2000 \(US\)](#)

[Rose Review, Rose, 2006 \(United Kingdom\)](#)

[Department of Education, Science and Training, Rowe, 2005 \(Australia\)](#)



In 1997, Congress convened a national panel—known as the National Reading Panel (NRP)—to examine the many studies conducted in the previous decades and reach a consensus on the best method to instruct young students in reading. After three years, the Panel released its report that concluded that systematic phonics is the best method for teaching beginning readers to read, that teachers should teach phonics explicitly, and that phonics is superior to Whole Language approaches.

#### **THE APPLICATION OF THE RESEARCH**

Reading research has proven that Phonics—a method of reading instruction that explains how visual symbols represent speech sounds—is the best way to teach beginners to decode an alphabetic writing system. CAPIT is thus a “phonics program” that teaches students the associations between letters and speech sounds.

### **3. EXPLICIT & SYSTEMATIC**

#### **THE RESEARCH**

[National Reading Panel, 2000](#)

“Findings provided solid support for the conclusion that systematic phonics instruction makes a bigger contribution to children’s growth in reading than alternative programs providing unsystematic or no phonics instruction.” (NRP 2-92)

“Students taught phonics systematically outperformed students who were taught a variety of nonsystematic or non-phonics programs, including basal programs, whole language approaches, and whole-word programs.” (NRP 2-95)

The NRP concludes that for Phonics instruction to be truly effective, it must be Explicit and Systematic.

#### **THE APPLICATION OF THE RESEARCH**

CAPIT introduces and teaches each new concept clearly and explicitly. CAPIT never introduces more than one concept at a time. And the CAPIT Scope and Sequence is Systematic, covering every phonics skill and print convention in an order that makes sense to young readers. We left nothing to chance, and never assumed that some aspect of reading and spelling can be learned without direction.

Additionally, CAPIT ensures that students know what they are supposed to know BEFORE they can proceed to learn new skills. CAPIT forces students to decode words, so they can’t guess by memorizing whole words. This process ensures that we fill in all missing skills gaps before students progress to learn new information.

### **4. SYNTHETIC PHONICS**

#### **THE RESEARCH**

[The Effects of Synthetic Phonics Teaching on Reading and Spelling Attainment, A seven year longitudinal study, Rhona Johnston and Joyce Watson, 2005](#)

This seven-year longitudinal study demonstrated the superiority of synthetic phonics over analytic phonics. The synthetic phonics group outperformed the analytic phonics group in reading and spelling. Furthermore, the analytic phonics group received additional phonological awareness training and “were

taught how to segment and blend spoken words at the level of both rhymes and phonemes, without the aid of print or letters.” And yet the synthetic phonics group “showed a significant advantage in ability to identifying phonemes in spoken words, performing even better than the group that had experienced direct training in this skill...”

#### **THE APPLICATION OF THE RESEARCH**

CAPIT is a synthetic phonics program. We do not multiply the number of items students must memorize. It suffices that students know the sounds /c/ /a/ /t/ to read /cat/. Therefore, it is unnecessary to have students memorize a new combination: /at/, as this would burden their working memory with unnecessary information.

## **5. SPELLING**

#### **THE RESEARCH**

[Establishing word representations through reading and spelling: comparing degree of orthographic learning: Orthographic Learning during Reading and Spelling, Nicole J. Conrad, Kathleen Kennedy, Wafa Saoud, Laura Scallion and Laura Hanusiak, 2018.](#)

In this study, researchers compared the orthographic learning accomplished through reading and spelling. Although both readers and spellers showed evidence of orthographic learning, spellers outperformed readers. The researchers conclude: “Overall, results suggest that spelling sets up a higher quality representation in memory and highlight the importance of spelling in the development of word reading efficiency.”

#### **THE APPLICATION OF THE RESEARCH**

CAPIT is both a Reading program and a Spelling program, and spelling tests make up the bulk of our curriculum. After CAPIT introduces a new skill, students spell ten words or ten phrases or ten sentences using the new skill, as well as previously learned skills. Spelling Tests allow students to apply what they learned immediately after learning it. Spelling Tests also assess students, and most importantly, spelling tests introduce students to the correct spelling of words in English. With CAPIT, students take hundreds of spelling tests before they leave kindergarten.

## PART 2: INSTRUCTIONAL STRATEGIES

### The Research We Utilized to Determine the Program's *Instructional Strategies*

#### 6. THE IMPORTANCE OF LETTERS

##### THE RESEARCH

The National Reading Panel looked at studies about Phonemic Awareness (PA) and concluded the following:

Instruction that taught phoneme manipulation with letters helped normally developing readers and at-risk readers acquire PA better than PA instruction without letters. (NRP 2-4)

Teaching with letters is important because this helps children apply their PA skills to reading and writing. Teaching children to blend phonemes with letters helps them decode. Teaching children phonemic segmentation with letters helps them spell... Teachers should recognize that acquiring phonemic awareness is a means rather than an end. PA is not acquired for its own sake but rather for its value in helping learners understand and use the alphabetic system to read and write. This is why it is important to include letters when teaching children to manipulate phonemes and why it is important to teach children explicitly how to apply PA skills in reading and writing tasks. (NRP 2-6)

See also:

Does awareness of speech as a sequence of phones arise spontaneously? Morais, J., Luz, G., Algeria, J., & Bertels, P., 1979.

Does Phoneme Awareness Training in Kindergarten Make a Difference in Early Word Recognition and Developmental Spelling? Ball, E. W., & Blachman, B., 1991;  
Developing Early Literacy, Report of the National Early Literacy Panel, 2008)

##### THE APPLICATION OF THE RESEARCH

CAPIT Reading always utilizes letters—from the very beginning of the program. Every time the student hears a sound (phoneme)—the student will also see a letter. CAPIT does not teach sounds without letters. We based this decision on the research that phonemic awareness exercises that utilize letters are three times more effective than those that do not involve letters. In the words of the [National Reading Panel Report](#): “Instruction that taught phoneme manipulation with letters helped normally developing readers and at-risk readers acquire PA better than PA instruction without letters.” (NRP, 2000, 2-4. See also 2-6.)

#### 7. VISUAL MNEMONICS

##### THE RESEARCH

The value of mnemonics for teaching letter-sound relations to kindergartners is supported by evidence. (NRP 2-125)

See also Ehri, Deffner, and Wilce (1984)

The NRP (2-125) extols the virtue of Visual Mnemonics which helps children with the difficult task of memorizing “arbitrary and meaningless” relations between “shapes and sounds.”

## THE APPLICATION OF THE RESEARCH

To help establish sound-to-spelling associations, CAPIT Reading provides a “visual mnemonic” for every letter of the English alphabet, both lowercase and uppercase. These mnemonics LOOK and SOUND like the letters, so they help establish an objective association in the student’s mind between the Sound and Spelling, unburdening the student’s memory, and easing the learning process. A Visual Mnemonic is like “cognitive super glue,” magically and quickly pairing together “Sounds” and “Spellings” to one another with a lasting bond.

## 8. SELF-TEACHING HYPOTHESIS

### THE RESEARCH

Phonological Recoding and Self-Teaching: Sine Qua Non of Reading Acquisition, Share (1995)

[Orthographic Learning, Phonology and the Self-Teaching Hypothesis, Share, 2008](#)

The self-teaching hypothesis (Firth, 1972; Jorm, 1979; Jorm & Share, 1983; Share, 1995) proposes that the ability to translate unfamiliar printed words into their spoken equivalents (“phonological recording” or simply “decoding”) is the central means by which orthographic representations are acquired. Each successful decoding of a new word is assumed to provide an opportunity to acquire the word-specific orthographic information that is the foundation of skilled visual word recognition. (Share, 2008).

Because all words are novel at some point in reading development, the reader must possess some algorithm, albeit imperfect, yet nonetheless functional for independently identifying words encountered for the first time in everyday reading... (Share, 2008).

According to the self-teaching hypothesis, students should learn a basic algorithm that enables them to decode words and that this decoding process teaches students how to spell those words.

According to the “self-teaching” hypothesis proposed by Jorm and Share (Jorm & Share, 1983; Share, 1995), “phonological recoding (print-to-sound translation) performs a self-teaching function enabling the learner to acquire the detailed orthographic representations necessary for fast, efficient visual word recognition” (Share, 1999).

### THE APPLICATION OF THE RESEARCH

A comprehensive and complete phonics program would, by necessity, teach every Sound in English, and then demonstrate each sound’s possible spelling conventions. The English language has 40+ Sounds, and we can spell these Sounds in 180+ Spelling Patterns. CAPIT Reading teaches students every Sound and Spelling—one lesson at a time. The CAPIT Reading curriculum is comprehensive because our algorithm covers the English alphabet code in its entirety. CAPIT introduces each portion of the algorithm—one per lesson, so students never have to learn more than one new concept at a time. In each lesson, students read and spelling novel words that contain the new spelling. Sufficient exposure to novel words is vital for skilled reading.

## 9. EFFECTIVE PHONICS TEACHING

### THE RESEARCH

Ameliorating Early Reading Failure by Integrating the Teaching of Reading and Phonological Skills: The Phonological Linkage Hypothesis, Hatcher, Hulme, & Ellis, 1994.

This study provides evidence to suggest that phonics teaching is more effective when students immediately apply what they learn.

### THE APPLICATION OF THE RESEARCH

After each new Reading Skill, which introduces a new print convention or phonics component, students immediately apply what they learned through reading and spelling new words (and old words to review previous concepts). Students cannot progress to learn a new concept without showing proficiency with all previous concepts.

## 10. SPELLING TESTS

### THE RESEARCH

Spelling as a self-teaching mechanism in orthographic learning, Daphna Shahar-Yames and David L. Share, 2008

Orthographic Learning, Phonology and the Self-Teaching Hypothesis. Share, 2008, p. 71.

Although reading leads to orthographic learning, spelling is a more robust learning tool that leads to more consistent orthographic learning. Why does the spelling of words lead to more consistent orthographic learning outcomes than reading? According to Share, spelling makes “additional processing demands” on the students, and “obliges the writer to process each and every letter in a word on every occasion whereas decoding encounters, although likely to be quite exhaustive initially, are probably less exhaustive on subsequent occurrences—particularly in connected text.”

### THE APPLICATION OF THE RESEARCH

The CAPIT curriculum ensures that students are aware that “learning to read” and “learning to spell” are not distinct tasks, but two sides of the same coin. CAPIT administers hundreds of spelling tests—beginning in Kindergarten. After every Reading Skill—a lesson that introduces a new Sound and Spelling Pattern which enable students to decode new words—students learn how to apply the new skill to spell multiple words, phrases, or sentences.

## 11. DIRECT INSTRUCTION

### THE RESEARCH

[Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching, Paul A. Kirschner, John Sweller, and Richard E. Clark. Educational Psychologist, 2006.](#)

Kirschner, Sweller, and Clark present “Evidence for the superiority of guided instruction.”

The conclusion has implications for reading instruction: decoding must be taught directly, explicitly, and with maximum guidance.

### **THE APPLICATION OF THE RESEARCH**

The latest research from the field of Cognitive Science guided all our decisions when designing our program. CAPIT teaches reading directly, explicitly, and with maximum guidance. Every new concept is communicated directly, and all problems are first solved for the student, so students don't have to discover the answer. Instead, we give them the tools and show them explicitly how to apply them.

Most importantly, all other digital programs are self-contained: students put on their headphones and learn from the computer program. We built CAPIT differently: teachers use CAPIT to teach students phonics explicitly, which happens every day for about 10 minutes. The CAPIT curriculum ensures that the phonics instruction is both systematic and explicit, and is taught by a human teacher. Students then progress on the program at their own pace for about 20 minutes every day.

## **12. COGNITIVE LOAD THEORY**

### **THE RESEARCH**

[Human Cognitive Architecture, John Sweller, 2008](#)

Cognitive Load Theory (CLT) posits that Working Memory's limitations demand the limitation/removal of unnecessary information—Extraneous Cognitive Load—during the learning process so that information can pass through Working Memory and be stored in Long-Term Memory.

### **THE APPLICATION OF THE RESEARCH**

Many (most?) learning programs ignore the structures that constitute human cognitive architecture as theorized by Cognitive Load Theory (CLT).

Cognitive Load Theory (CLT) guided, informed, and shaped every aspect of our program. We deliberately removed all unnecessary information that can increase the Extraneous Cognitive Load, such as the virtual world, animated characters, unnecessary jingles, as well as anything that resembles a game. We even removed the extrinsic rewards. CAPIT is a unique phonics curriculum that is clean, simple and is 100% Learning 100% of the Time.

## PART 3: ASSESSMENTS

### The Research We Utilized to Determine the Program's *Assessments*

#### 13. SPELLING TESTS AS AN INDICATOR OF WORD SPECIFIC ORTHOGRAPHIC KNOWLEDGE

##### THE RESEARCH

[The Unique Role of Early Spelling in the Prediction of Later Literacy Performance Rebecca Treiman, Jacqueline Hulslander, Richard K. Olson, Erik G. Willcutt, Brian Byrne & Brett Kessler, 2019.](#)

What is the nature of early spelling? Does spelling have a utility when screening young children for future reading abilities?

This study explores two hypotheses regarding spelling: Is spelling in kindergarten a proxy for phonological awareness and letter knowledge. If yes, then children spell by segmenting spoken words into phonemes and assigning letters to the phonemes.

Alternatively, spelling is not only a proxy for PA and letter knowledge but rather a test of the student's ability to store precise information about words' orthographic forms.

The results of this study validate the second hypothesis and suggest that the results of spelling tests in children's early years are an indicator of their future literacy success and that spelling tests should be added to early screeners.

##### THE APPLICATION OF THE RESEARCH

CAPIT uses spelling tests as a formative assessment—beginning in Kindergarten. Students take hundreds of spelling tests before they enter first grade.

#### 14. DIRECT INSTRUCTION

##### THE RESEARCH

[Why Minimal Guidance During Instruction Does Not Work: An Analysis of the Failure of Constructivist, Discovery, Problem-Based, Experiential, and Inquiry-Based Teaching, Paul A. Kirschner, John Sweller, and Richard E. Clark. Educational Psychologist, 2006.](#)

The authors of this study present “Evidence for the superiority of guided instruction,”

The conclusion has implications for reading instruction: decoding must be taught directly, explicitly, and with maximum guidance.

##### THE APPLICATION OF THE RESEARCH

All digital programs are equipped with an adaptive feature that moves a struggling student back to an easier lesson in the program.

CAPIT works differently. CAPIT does not rely on a computer program to assess the child and determine their level. Instead, if a student makes three errors in a row, CAPIT locks the student out. The teacher then removes the lock and diagnoses the problem by asking the student to complete the exercise with them. Teachers know their children better than computers do and, therefore, can diagnose and fix the problem in less than a minute. Including the teacher in the error correction process is more effective. It saves time and ensures students stay motivated and engaged in learning.