Learning to Read and Spell Words:

How Teachers’ Instruction and Students’ Reading Practices Contribute to the Development of Word Reading and Spelling Skill

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Questions about Reading Words
Different Ways to Read Words

By Decoding:
1. Convert letters into sounds,
2. Blend sounds to form a pronunciation,
3. Match pronunciation to a word meaning in memory

Identify graphemes, convert to phonemes, blend

Phonemes are smallest sounds in words shown between slash marks

Graphemes are 1 or more letters that represent phonemes
- D O G  --> /d/ /o/ /g/  --> “dog”
- CH E CK (5 letters, 3 graphemes)  --> /č/ /Ẹ/ /k/  --> “check”

More advanced readers
- Segment and blend larger letter units: syllables, prefixes, suffixes, root words
  - EXCELLENT  --> /ex/ /cel/ /lent/  --> “excellent”
  - UPHOLDING  --> /up/ /hold/ /ing/  --> “upholding” (prefix, root, suffix)
Sources of Confusion

- Graphemes versus letters
- Graphemes are the important units for decoding
  1 grapheme may consist of 2 or 3 letters representing 1 phoneme
  SH, TH, CH, NG, WH, PH, CK, EA, AI, GHT
- Letters can mislead about the phonemes in words
- How many phonemes in these words?
  Teach
  Thing
  Straight
Sources of Confusion

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   SH, TH, CH, NG, WH, PH, CK, EA, AI, GHT
Letters can mislead about the phonemes in words

- How many phonemes in these words?
  *Teach*  3 phonemes  t + ea + ch
  *Thing*  3 phonemes  th + i + ng
  *Straight*  5 phonemes  s + t + r + ai + ght

Count graphemes, not letters
Monitor sounds and mouth movements
Other Ways to Read Words

• **By Analogy:**
  
  \[
  \begin{align*}
  \text{n ight} & \rightarrow \text{br ight} \quad \text{d og} \rightarrow \text{fr og} \\
  \text{b ottle} & \rightarrow \text{thr ottle}
  \end{align*}
  \]

  Requires memory bank of known written words

• **By Prediction:** context & letters
  
  • At the hospital, the doctors and n........

• **By Memory / Sight**
  
  • Dog \rightarrow \text{“dog”}
Which ways are used?

WORDS AND NONWORDS NEVER READ BEFORE

Application of Strategies to read

• By Decoding
• By Analogy
• By Prediction

FAMILIAR WORDS READ BEFORE

By Memory / Sight

Sight of the word activates its pronunciation and meaning in memory

Note: All words when practiced become read from memory by sight.
AUTOMATICITY – Stroop Task

**TASK:** Name the color or picture, ignore the words

RED  GREEN  BLUE  BLACK

Evidence that familiar words are read from memory.
How to Explain Sight Word Reading?
Facts to Explain

• Skilled readers recognize thousands of words in an instant
• Accuracy is high, especially in text
• Similarly spelled words aren’t confused
  • Stick, sick, slick, stink, stiff
• Written words stored in memory quickly – little practice required
• Decoding is too slow to explain
• Too many words to memorize visually by shape or letter chains

Powerful mnemonic system is required to get the spellings of words into memory to explain sight word reading.
Which spelling is easier to store in memory? Why?

• Phoenigm* – reddening of the skin

• Pication - application of warm pitch to the skin as medical treatment

Both have 8 letters

*Pronounced “feen” as in Phoenix, “nime” as in paradigm
Reading Words from Memory

- Process of forming connections or mappings

Knowledge of the grapheme-phoneme system provides the glue connecting spellings to pronunciations in memory
Examples of grapheme-phoneme mappings for regularly spelled words

STOP
/s/-/t/-/o/-/p/

CHECK
/ch/-/e/-/k/

GILE
/g/-/l/-/g/-/L/

BIRD
/b/-/r/-/d/

←Graphemes
←Phonemes
Examples of grapheme-phoneme mappings for irregularly spelled words

I S* L A N D
/ay/-/l/-/a/-/n/-/d/

S W* O R D
/s/ - /o/ - /r/ - /d/

L I S T* E N
/ℓ/-/i/-/s/-/e/-/n/

S I G* N
/s/ - /ay/ - /n/

* “Silent” letters
Knowledge needed to form connections and secure the spelling of words in memory

• **Phoneme segmentation**
  • Analyze the word’s pronunciation into its smallest sounds or phonemes

• **Grapheme-phoneme correspondences**
  • Know letter-sound units of the writing system (the glue)

• **Orthographic Mapping**
  • Connect graphemes in spelling to phonemes in pronunciations when reading individual words
  • Decoding – best strategy

• **Meaning activation**
  • Connect spelling and pronunciation to meaning in memory
  • Homonyms – need context to form correct connection
    
    Examples:  *there* vs. *they’re* vs *their*;  *too* vs. *two* vs. *to*
Multi-letter Units to Form Connections for Sight Word Learning

• Spelling patterns
  -ump in *jump, bump*; -ent in *bent, tent*; -ire in *fire, tire*;

• Syllables

• Prefixes, roots, suffixes

• Connect larger spelling units to sound units to learn words

• Example: *interesting*
  4 syllable connections: in ter est ing
  9-10 grapheme-phoneme connections: i n t e r e s t i n g
Word Reading: Phases of Development

Growth is portrayed by the predominant type of alphabetic connection used to read and spell words

Phase 1: Pre-alphabetic
  Use of visual, non-alphabetic connections

Phase 2: Partial alphabetic
  Use of partial letter-sound connections

Phase 3: Full alphabetic
  Use of more complete grapheme-phoneme connections

Phase 4: Consolidated alphabetic
  Use of multi-letter connections for syllables, affixes
  Examples: -ING, -TION, PRE-, CON-; IN – TER – EST - ING
Pre-alphabetic Phase

• Pre-readers
  • Cannot decode words; cannot read text independently

• Little if any use of letter-sounds to read or spell

• Writes words with random, pseudo or memorized letters, not connected to sounds
  • Example: knowing letters in own name

• Pretends to read memorized stories

• Uses visual cues to remember how to read words and environmental print
VISUAL CUES USED TO READ WORDS DURING THE PRE-ALPHABETIC PHASE

Colors and logo to read McDonalds

Eyes as visual cues to read LOOK

Colors and logo – Misread as Pepsi

Tail as visual cue

Two humps as visual cue
Movement into Partial Alphabetic Phase

• Learn letter shapes, names and sounds
• Acquire some awareness of sounds in words
• Can write partial letter-sound spellings of words
  • Examples: BP for bump; KR for car
  • Very hard to remember correct spellings
• Cannot decode new words
• Can guess words from partial letters or context
• Can read words by sight
  • Connects partial letters to sounds in words
  • Misreads words sharing similar letters: stop for step /s/ /p/
  • Not fully accurate
Early invented spellings may be unexpected

- HKN (chicken) — name of H (aich) contains /ch/
- LDL (little) — middle sound is closer to /d/
- HRK (truck) — initial sound pronounced more like /ch/
- JRN (dragon) — initial sound pronounced more like /j/

To understand spellings at the beginning of partial alphabetic phase, you need to figure out how children are using knowledge of letter names to analyze sounds in words.
More Advanced Invented Spellings in the Partial Phase

Female, Age 6, K

Bot (boat)
On (girl)

Chicken (chicken)
Friends (friends)

Nar (natur)
Blowes (bleuses)

Truc (truck)
Drie (drih)

Monor (monster)
Drinikin (drinking)
Movement into Full Alphabetic Phase

- Learn the major grapheme-phoneme correspondences
  - The glue
- Learn to segment words into phonemes
- Map graphemes in spellings to phonemes in pronunciations to store sight words in memory
  - Graphemes are fully bonded to phonemes
- Learn to decode new words
  - Sound out and blend letters
  - This helps sight words get into memory
Learning to Read 15 Similarly Spelled Words Over Trials

Percent of Words Read Correctly

Set of words: bend, bib, blast, blond, dot, drip, drum, dump, lamp, lap, list, spin, stab, stamp, stand

Trials to Learn 15 Words

Kindergartners’ Instruction

- Full Phase
- Partial Phase
Full Alphabetic Phase

- Children’s *sight word vocabularies expand*
  - Words recognized automatically
  - Word reading is accurate
  - Strategy of reading words by analogy becomes possible
- Children can *invent* more complete letter-sound spellings
- Children can *remember* correct spellings of words
- Children can *read text independently* at their level
- **Note.** Word reading and spelling abilities are *constrained* by their knowledge of letter-sound regularities.
Movement into the Consolidated Alphabetic Phase

Children learn multi-letter patterns as consolidated units
Rime spellings: -amp in camp, damp, lamp, champ
-ing, -ed, -ack, -ake, -est, pre-, -tion,
36 rime spellings appear in over 500 words
Spellings of syllables, morphemes including root words and affixes.

Children use letter patterns to form spelling-sound connections:
- to decode multi-syllabic words
- to retain sight words in memory
- to remember spellings of words

Sight vocabulary grows rapidly

Knowing more words enables strategy of reading words by analogy

Study: Practice reading words as wholes versus in syllable units
Application to Teaching and Instruction

• Systematic comprehensive phonics program in K-2nd grades
  • Teach phonemic awareness (PA)
  • Teach major grapheme-phoneme (GP) relations
  • Teach decoding
• Insure teacher knowledge of PA and GP relations
Table of Contents
- Why Study Language?
- Phonetics: The Sounds of Speech
- Phonology: Speech Sounds in Use
- The Structure of English Orthography
- Morphology: Roots, affixes
- Syntax: How Sentences Work
- Semantics: Words and Phrase Meanings
- Language and Reading Instruction
- Developmental Spelling Inventories

Available at Amazon.com
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To build sight vocabulary
• Beginners practice reading easier text aloud
• Readers acquire a habit of decoding rather than guessing and skipping over new words in text
• To study words for spelling tests: focus on spelling-sound connections
• To learn new vocabulary words, show spellings of words
Pictures to Teach Grapheme-Phoneme Relations

Learning Task
1. Letter shapes
2. Letter sounds
3. Connections
Embedded Mnemonics to Teach Grapheme-Phoneme Relations

From Lyn Wendon, *Letterland Program*. Published by Letterland.
From Curious George Learns the Alphabet, by M. & H. Rey, 1963.
T table, C crab, h horse, k kangaroo, H house, f flower
Embedded Picture Mnemonics to Teach Short Vowel Letter-Sound Correspondences

(From Letterland, by Lyn Wendon)
Demonstration

• Hebrew letter-sounds taught with embedded picture mnemonics
• Learn the letter-sound relations
• Test your memory
הלל
TEST
ship

lizard

nose

desk
Teaching Phonemic Awareness (PA)

• 40-41 phonemes in English

• Definition: Teaching children to detect and manipulate sounds in spoken words (not letters)

• Examples of PA tasks for preschoolers:
  • Say the first sound in “fish.” Say the last sound.
  • Find two objects that begin with the same sound
Teaching Phonemic Awareness (PA)

What makes PA difficult?
Shifting attention from meaning to sounds
Sounds are ephemeral, fleeting, disappear
No breaks between sounds in words
Sounds overlap, coarticulated
What helps children detect sounds in words?
Concrete markers such as letters
Example: Move letters in boxes to show sounds in “mop”

Fill with letter tiles:

Sound Segmentation Boxes
What else helps children learn phonemic segmentation?

Awareness of mouth movements and positions
Motor theory of speech perception

Phonemes are represented in the brain by articulatory gestures, not by sounds

“What sounds do you hear?”
“How is your mouth moving?”
Mouth Positions Depicting Sounds Associated with Letters

Mouth drawings from C. Lindamood and P. Lindamood (1975)
Fill with mouth pictures:

Phoneme Segmentation Boxes
Word to segment is "see"

Fill with mouth pictures:

Phoneme Segmentation Boxes
Word to segment is “vote”

Fill with mouth pictures:

Phoneme Segmentation Boxes
Words Read Correctly Over Trials by the Two Groups Taught Phonemic Segmentation and the Control Group

Words Read From Memory Over Trials

<table>
<thead>
<tr>
<th>WRITTEN</th>
<th>WORD READ</th>
<th>PRONUNCIATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>BO</td>
<td>“bow”</td>
<td></td>
</tr>
<tr>
<td>SA</td>
<td>“say”</td>
<td></td>
</tr>
<tr>
<td>TE</td>
<td>“tea”</td>
<td></td>
</tr>
<tr>
<td>BED</td>
<td>“bed”</td>
<td></td>
</tr>
<tr>
<td>SOP</td>
<td>“soap”</td>
<td></td>
</tr>
<tr>
<td>TAL</td>
<td>“tail”</td>
<td></td>
</tr>
</tbody>
</table>

Let + Artic. Letter Only

Control No Treatment

Mean Words Read Correctly (6 max)

Trial 1 2 3 4 5 6 7 8
Keyword Program: Reading by Analogy

Weekly Sets of Keywords Taught
1: in and up
2: king long jump
3: let pig day
4: truck black not
5: cat it go look
6: red fun he
7: name swim my map
Students’ Problems with Keyword Analogy Program

• Relying on word wall to find keywords
• Not storing keywords in memory
• Using context to guess words rather than analogy strategy
• Processing partial letters in words – misreading similar words
• Omitting or misspelling some letters in writing words
• Lacking phonemic segmentation
• Incomplete knowledge of grapheme-phoneme relations
• Partial phase of word reading
• Need to become full phase readers
Program Revision: Developing Word Detectives

Students taught to fully analyze connections between graphemes and phonemes in keywords.

Steps

1. Pronounce spoken word
   “king”

2. Say and count separate phonemes on hand
   /k/  /i/  /ŋ/

3. View and examine spelling
   KING

4. Match letters to phonemes, reconcile discrepancies
   K  I  NG
   (i.e., two letters make one sound; letter has no sound)
   “It takes two letters to spell the sound /ŋ/”
   /k/  /i/  /ŋ/

5. Identify another keyword with that vowel
   IN /i/

After analyzing the 3 or 4 keywords, students spelled them from memory by recalling grapheme-phoneme connections.

(Ehri, Satlow & Gaskins (2009). Reading and Writing Quarterly.)
Teaching Reading Is Rocket Science

What Expert Teachers of Reading Should Know and Be Able To Do

American Federation of Teachers