

Scientific Word Investigations: The importance of Morphology, Etymology, and Phonology

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OUTLINE

Introduction

- Goals
- Spelling exercise
- Clarify some definitions
- Intro to/review of the brain and learning
- What is Dyslexia?
- Reading Development and Literacy Instruction
- Important facts about spelling

OUTLINE

- Language History and Evolution
- Scientific Investigation of the writing system
 - Important terms
 - What is reading and how are we teaching it?
 - What SWI is and is not
 - Scientific inquiry and its tools
 - Goal is understanding the writing system

GOALS

Answer the following:

- What is OG? What is SWI?
- What is the difference between phonics and phonology?
- What does linguistics tell us about written language?
- Why should we use the scientific method to investigate written language?

Defining Our Terms

- **Linguistics** → **lingu** + **ist** + **ic** + **s**
 - the study of *language*s
- **Phonology** → **phone**/ + **o** + **log(e)** + **y** (phoneme)
 - the study of the *psychology* of spoken language
- **Phonetics** → **phone**/ + **et(e)** + **ic** + **s** (phone)
 - the study of the *physiology* of spoken language
- **Morphology** → **morph** + **o** + **log(e)** + **y** (morpheme)
 - the study of the form/structure of words

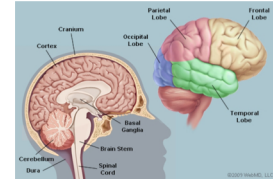
Defining Our Terms

- **Phonics** → **phone**/ + **ic** + **s**
 - literacy instruction based on small part of speech research and psychological research
- **Phonemic Awareness**
 - awareness of phonemes??
- **Orthography** → **orth** + **o** + **graph** + **y**
 - correct spelling
- **Orthographic phonology**
 - The study of the connection between graphemes and phonemes

Defining Our Terms

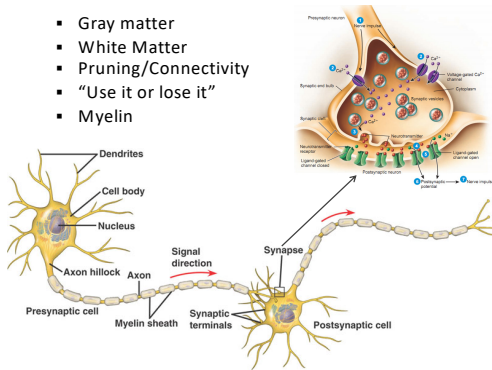
- **Phoneme** → **phone** + **eme**
 - Psychological representation of speech units spelled by a grapheme and distinctive for meaning
 - Example: pæt/bæt vs hɪt/hɪt^h
- **Grapheme** → **graph** + **eme**
 - Psychological representation of writing units that spell a phoneme
- **Morpheme** → **morph** + **eme**
 - Psychological representation of meaning units that make up words

The Beautiful Brain



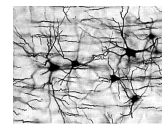
Brain Development

- Gray matter
- White Matter
- Pruning/Connectivity
- "Use it or lose it"
- Myelin

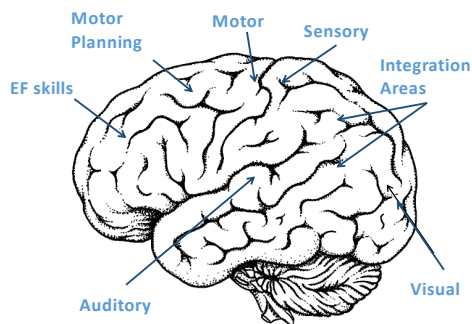


Learning

- Learning by experience
 - Use it or Lose it
- Neural networks
- Multi-sensory instruction
 - Tactile/sensory
 - Kinesthetic/motor
 - Auditory
 - Visual



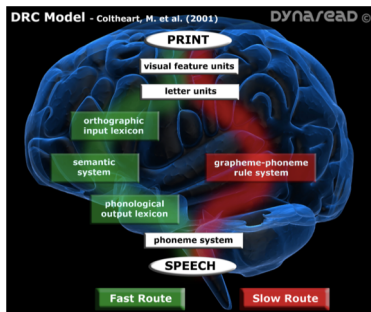
Brain Areas



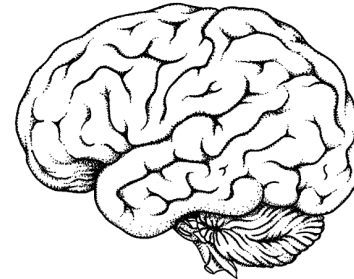
Dyslexia Basics

- Neurobiological
- Is NOT due to a hearing or vision problem
 - NOT from Convergence Insufficiency
 - NOT from CAPD
- May include deficits in:
 - Phonological working memory
 - Phonological processing
 - Rapid naming
 - Orthographic processing
- Often comorbid with ADHD, EF, sensory issues

DUAL-Route model of reading



DUAL-Route model of reading



Important Facts about Spelling

- ❖ The written language is not the spoken language written down
- ❖ The primary goal of written language is to represent meaning NOT the pronunciation of the language
- ❖ Speech is thought made audible, Spelling is thought made visible
- ❖ Spelling makes sense

Language History and Evolution

(there's always a reason)

Spoken vs. Written Language

Speaking is how we get **meaning** from our brain into others' brains via their ears.

Writing is how we get **meaning** from our brain into others' brains via their eyes.

History of Spoken English



History of Spoken English



Renaissance → Now



Evolution of Language

Spoken Language

- Meaning
- Amelioration/Pejoration
- Pronunciation

Written Language

- History of Literacy
- Scribes/Printing Press
- Dictionaries

Scientific investigation of the writing system

Meaning, Structure, History AND Phonology

Phonology is important, it's just not the **most** important

- Phonological Primacy/Phonics
- Homophone principle

“Sight” Words

- Why is there a <w> in <two>?

Schwa

- Why do we spell [dɪfrənt] <different> and not <difrent>

“Sight” Words

What does phonics/OG do?

High Frequency
Dolch/Fry lists
Don't “play fair”
Memorize

Instead

Function Words vs Content Words
Investigate Morphology,
Etymology and Phonology
Teach schwa and do it accurately

Stress and Schwa

English is stress-timed

Schwa

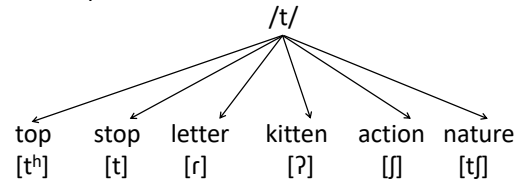
- occurs ONLY in unstressed syllables
- NOT /ʌ/
- IMPOSSIBLE to spell with phonology alone

Production vs Perception

Orthographic Phonology

Phonemes are spelled by **graphemes**

Allophones: different phonetic realizations of the same phoneme



Zero allophone: <prints> <sign> <thing>

What does it mean to “read”?

Sound out/pronounce words??

- Reading aloud adds cognitive load
- Focusing on sounding out can obscure meaningful structures
- Pronounce without gaining meaning

Gain meaning from print??

- Gain meaning without pronouncing
- Focusing on meaning, structure, and history helps us understand spelling

What does it mean to “read”?

Spoken syllables vs. written syllables

- [ˈækʃən] VS. <act + ion>
- Which analysis is more meaningful??
- Why do we say it this way? VS. Why do we spell it this way?
- Making connections via Word Families

act	active
acts	action
acted	actually
acting	exact
actor	transaction

Introductory Exercises

Semantics

prints
rows
mined
acts

Syllables

action → act + ion
animation → anime/ + ate + ion
tension → tense/ + ion
musician → music + i + an

Graphemes/Phonemes

cried/cry
creature/create
real/reality
finger

Zero allophones

hymn/hymnal
sign/signal
bomb/bombard
mnemonic/amnesia

Introductory Exercises

Markers

two/twin/twice/twenty/twelve/between/twilight
wring/writhe/wrought/wrinkle/wriggle/wrist
knight/knee/kneel/knob/knuckle/knot

Word Families

act	actor
acts	activist
acted	actually
acting	transaction
action	reaction
active	exactly

Scientific Inquiry

General Steps

- Collect data/evidence
- Develop a hypothesis
- Test your hypothesis
- Collect more data/evidence and refine your hypothesis as needed

Scientific Inquiry

Written Language

- Investigate semantics (meaning)
- Hypothesize about morphology (form/structure)
- Test your hypothesis using etymology (history and relatives)
- Investigate orthographic phonology
- Revise your hypothesis as needed

Scientific Inquiry

The four questions

- Q1: What does it mean?
- Q2/3: How is it built? What are its history and relatives?
- Q4: What can we learn from its pronunciation?

Scientific Inquiry Tools

- **New Perspective**
Not why do we say it that way, but why do we SPELL it that way (no pronounce and guess)
- **The Four Questions**
Mean? Built? Relatives? Pronunciation?
- **Word Sums**
act + ion → action
- **Matrices**
- **Online Resources**

hyper	act	ed
re	do,	ing
	perform	ive
		s
		ion
		or
		s

Scientific Inquiry

<sign>

Q1: What does it mean?

noun

- 1 an object, quality, or event whose presence or occurrence indicates the probable presence or occurrence of something else
- 2 a gesture or action used to convey information or instructions
- 4 *Mathematics* the positiveness or negativeness of a quantity

verb

- 1 *[with object]* write one's name on (a letter, card, or similar item) to identify oneself as the writer or sender
- 2 *[no object]* use gestures to convey information or instructions

Scientific Inquiry

<sign>

Q2: How is it built?

<sign> is a base element

Scientific Inquiry

<sign>

Q3: What are its history and relatives?

sign (n.)

early 13c., "gesture or motion of the hand," especially one meant to communicate something, from Old French *signe* "sign, mark," from Latin *signum* "identifying mark, token, indication, symbol; proof; military standard, ensign; a signal, an omen; sign in the heavens, constellation," according to Watkins, literally "standard that one follows," from PIE **sekw-no-*, from root **sekw-* (1) "to follow."

Scientific Inquiry

<sign>

Q3: What are its history and relatives?

sign (v.)

c. 1300, "to make the sign of the cross," from Old French *signier* "to make a sign (to someone); to mark," from Latin *signare* "to set a mark upon, mark out, designate; mark with a stamp; distinguish, adorn;" figuratively "to point out, signify, indicate," from *signum* "identifying mark, sign" (see **sign** (n.)). Sense of "to mark, stamp" is attested from mid-14c.; that of "to affix one's name" is from late 15c. Meaning "to communicate by hand signs" is recorded from 1700. Related: Signed; signing.

Scientific Inquiry

<sign>

Q3: What are its history and relatives?

signs → sign + s
signed → sign + ed
signing → sign + ing
signal → sign + al
signify → sign + i + fy
design → de + sign
designate → de + sign + ate
signature → sign + ate/ + ure
resignation → re + sign + ate/ + ion

Scientific Inquiry

<sign>

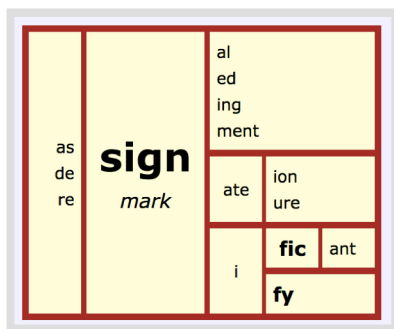
Q4: What can we learn from its pronunciation?

<s i g n> <d e s i g n>
[s aɪ n] [d ə z aɪ n]

<s i g n a l>
[s ɪ g n ə l]

<r e s i g n a t i o n>
[r ɛ z ə g n ɛ i j ə n]

Scientific Inquiry



Scientific Inquiry

Other spellings to ponder

- Why is there a <w> in <two>?
- Why do we spell [dɪfrənt] <different> and not <difrent>?
- Why do we not replace the <e> at the end of <change> in <changeable>?

Let's Investigate!

Resources: Investigation of Written Language

Etymological Dictionary (Etymonline):

<https://www.etymonline.com/http://>

Word Searcher:

www.neilramsden.co.uk/spelling/searcher/

Mini Matrix Maker:

<http://www.neilramsden.co.uk/spelling/matrix/temp/index.html>

Resources: Investigation of Written Language

Gina Cooke (LEX):

<https://linguisteducatorexchange.com/lexinars/>

Pete Bowers (WordWorksKingston):

<http://www.wordworkskingston.com/WordWorks/Home.html>

Real Spelling: <http://www.realspelling.fr/>

Resources: Investigation of Written Language

Blogs:

<http://barnettsbuzzingblog.edublogs.org/>

<http://rebeccaloveless.com/blog/>

<https://languageinnerviews.com/>

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