### Phoneme = a minimally contrastive unit of speech

dogs = /d/ /aw/ /g/ /z/  
clogs = /k/ /l/ /aw/ /g/ /z/

- /r/ and /l/ are phonemes in English, but not Japanese  
- /p/ and /l/ are only phones in English

### The Plan

1. Phonemic awareness & reading  
2. Academic standards for phonemic awareness  
3. Early and later tasks to teach  
4. Teaching activities & materials  
5. Scaffolding & ordering learning  
6. Instruction intensity  
7. And a look at phonological memory & retrieval tx

### For More Ideas and Information

The Plan

- Phonemic awareness & reading
- Academic standards for phonemic awareness
- Early and later tasks to teach
- Teaching activities & materials
- Scaffolding & ordering learning
- Instruction intensity
- A look at phonological memory & retrieval

### Phonological Awareness

THE SOUNDS OF SPEECH

1. Phonemic awareness
2. Onset - rime (/d/-/awg/, /bl/-/awg/)
3. Syllables (/ba/-/na/-/na/)

Plus sort of but not really:
1. Words (hot-dog, I see mom) — involves meaning
2. Environmental sounds (tweet-tweet) — not speech

BUT NOT THE SOUNDS OF LETTERS
Other Terminology Related to Phon-

• Phones
• Phonemes
• Phonemic awareness
• Phonological awareness
• Phonological processing

• Phonetic spelling
• Phonics
• Alphabetic principle
• Graphemes
• Orthographic knowledge

Increasing Levels of Phonemic Awareness

Ukrainetz, Nuspl, Wilkerson, & Beddes (2011)

PreK tx study on teaching phonemic vs syllable awareness

• No formal instruction in the daycares

Results

• Big increase on first phoneme isolating:
  – 2005, n = 15, pre-test = 1.2 (2.0), 0 ≥ 8/10
  – 2007, n = 24, pre-test = 5.3 (4.2), 12 ≥ 8/10

• Variable across children, with trend to increase, but statistically stable on letter names:
  – 2005, pre-test = 14.9 (10.5)
  – 2007, pre-test = 20.1 (8.7)

• not sig diff, d = 0.50

Phonemic Awareness in Reading

• In scientifically-based curricula
  – "Phonemic awareness," phonics, vocabulary, comprehension, fluency

• In simple view of reading
  – In the Decode part of Decode + Comprehend

• In DIBELS progress testing for K-1
  – First phoneme matching, phoneme segmenting

• In actual teacher practices
  – Classroom reading curricula and instruction

So What Should SLPs Do?

• Formally our domain as an oral language skill important for reading

• Used to teach teachers about it but no longer

• Still our domain for children with language disorders

• But need to be strategic and efficient in tx, doing only what is needed for as long as needed

For once, we may need to do less rather than more!

OLD View of Developmental Order

3-4 yrs: Sounds & sentences tasks
4-5 yrs: Rhyme & syllable tasks
5-6 yrs: First phoneme tasks
6-7 yrs: All other phoneme tasks in monosyllabic words
8 yrs+: All other phoneme tasks in multisyllabic words

NEW View of Developmental Order

3-4 yrs: First phoneme tasks
4-5 yrs: First phoneme, rhyme, syllable tasks
5-6 yrs: Phoneme segment & blend in monosyllabic words
7 yrs+: Other phoneme tasks in monosyllabic & multisyllabic words
So What to Teach?

For Effectiveness and Efficiency?

Common Core Standards & Decoding

- Reading code skills paramount in NCLB
  - Improved early basic reading performance across nation
- Attention shifted to comprehension and composition with Common Core

Practices and the Council of Chief State School Officers, 2010

The Common Core’s emphasis on high-level comprehension skills calls for a reversal of NCLB’s focus on decoding and low-level literacy skills (Calkins et al., 2012, p. 29)

Common Core Kindergarten Standards

Demonstrate understanding of spoken words, syllables, and sounds (phonemes)

1. Recognize and produce rhyming words
2. Count, pronounce, blend, and segment syllables in spoken words
3. Blend and segment onsets and rimes of single-syllable spoken words
4. Isolate and pronounce the initial, medial vowel, and final sounds in three-phoneme (CVC) words (not including final /l/, /r/, or /x/)
5. Add or substitute individual phonemes in simple, one-syllable words to make new words

First Grade Standards

Demonstrate understanding of spoken words, syllables, and sounds (phonemes)

1. Distinguish long from short vowel sounds in spoken single-syllable words
2. Orally produce single-syllable words by blending sounds, including consonant blends
3. Isolate and pronounce initial, medial vowel, and final sounds in spoken single-syllable words
4. Segment spoken single-syllable words into their complete sequence of individual sounds

Standards & Research Evidence

- Phoneme isolation, segmenting, and blending for simple words needed for reading and spelling
- First grade standards make sense
- Lack of second grade fancy task standards make sense
- BUT kindergarten standards include optional skills, adding unnecessary complexity and work

Don’t interpret the CCSS [Common Core] as a mandate to shoehorn more stuff into an already overcrowded curriculum (Calkins et al., 2012, p. 182)
Past Practices
- Teach phonological awareness
  - Syllables and rhyme are obvious and easy
  - Entry into speech sound awareness
- Start with these large speech units
  - For preschoolers
  - K-1 tx progression
  - Initiate minimal speech unit after mastery of larger unit
- Phoneme achievements
  - Preschoolers culminate with first sound introduction
  - K could master first sound tasks
  - 1st could master simple segmenting

Revising the Recommendations – Start and Stay with Phonemes
- Larger speech units not an easier entry
  - Rhyme and syllable not needed for early reading/spelling
  - Nor for entry into phonemes
  - Some first phoneme tasks very easy
  - Syllable to phoneme segmenting confusing
- Right from the get-go
  - Start with phonemes for K and preschoolers
  - Use rhyme incidentally to highlight sounds of words
- Phoneme achievements
  - Pre-K can master first sounds (many w/o explicit instruction)
  - K can master simple segmenting

So that should save time!

Tasks to Teach
1. Isolating first, middle, final phonemes
2. Matching first, middle, final phonemes
3. Segmenting simple words into phonemes
4. Blending simple words from phonemes

Just teaching these should save time.

And Even Phoneme Order Not Strict
1. Visible and continual consonants
   - /m/, /n/, /l/, /s/...
2. Not visible but salient consonants:
   - /g/, /n/, /sh/, /dz/...
3. Word initial consonant clusters and tense vowels:
   - /sp/, /sm/, /sk/, /t/, /u/...
4. Everything else
   - /r/, /l/, /w/, /j/   /sr/, /gr/, /tw/
   - /s/, /aw/, /e/   V-/sk/, V-/nk/, V-/gz/

Guide to task order OR to support and expectations

Making Tasks Harder or Easier
- Tasks can be made harder by increasing cognitive and memory demands
- e.g., phoneme matching
  - Match from two words
  - Match from four words
  - With or without pictures
  - With known or unknown vocabulary

What About These Fancy Tasks?
1. Deleting and substituting (change the /g/ in blog to /f/)
2. Multisyllabic words (extraordinary, inspirational)
3. Deleting and substituting communicatively (Pig Latin)

Maybe benefits, but not as phonemic awareness per se
- Phonemic awareness contributes little to reading ability beyond 3rd grade level
- Advanced phonemic awareness tasks involve cognitive operations, memory, and spelling
- Reading and spelling experiences improve phonemic awareness
Fancy Phonemic Awareness Tasks for Reading and Spelling

- Long words NOT read or spelled letter by letter
  - Syllabic, morphemic chunks, and MGRs
- And listening hard can make your spelling worse!
  - butter, been, words
  - /u/ as in moo, through, de, lieu, new, blue, tune
- What about all that work holding exclamation in mind while sounding it out and moving blocks around? More on that to come...

Who Should Get Phonemic Awareness Tx?

- Children on our IEPed caseload (Tier III)
  - First phoneme awareness for preschool
  - Basic phonemic awareness for K-2, depending...
  - Fancy phonemic awareness for 3+, depending...
- Basic phonemic awareness part of Tier I and II reading instruction
  - Check on explicitness and quality
  - Possibly participate in Tier II remediation

You can be an extra pair of hands, but don’t you have something else you should be doing?

Phonemic Awareness Tx Need

- Basic phonemic awareness (isolating, segmenting, blending)
- Indicators:
  - Low on first phoneme isolating or matching in late preschool or early K
  - Low on phoneme segmenting in late K
  - Spelling is pre-phonetic or missing phonemes:

```
m  mom  ab  cat  sa  sun
pas  place  fat  fast
```

How to Teach?

Approaches, procedures, activities, materials
Overview of Phonemic Awareness Instruction

1. A culmination of a vertical hierarchy of environmental sound, word, syllable, rhyme, and phoneme activities.
2. Hierarchical vertically-ordered discrete single-skill phoneme tasks
3. Cycled horizontally-ordered and integrated mix of contextualized and discrete phoneme tasks

Phonemic Awareness in Daily Life

- Sound play
  - Rhymes
  - Preschool joke talk
  - Pig Latin
- Talk about text
  - Let’s read a story
  - Let’s write a story

Phonemic Awareness Activities

1. Name play
   - No materials needed
2. Contrived drill-games
   - Matching, Fishing, Guess-the-Word
   - Artic cards, phonology cards, plastic food, puzzles
3. Shared books
   - Alphabet
   - Alliterative
   - Rhyming
4. Message Writing
   - Writing to dictation, child writing
   - White board, paper, or computer

Drill-Games

Remember the Reciprocal Relationship

Phonemic Awareness

Reading and Spelling

Animal Puzzles and Food Bag

OSHA Convention, Salem OR
October 2016
Alphabet & Alliterative Books

Focus on the Sounds Not the Letters

- Big BEAR buys a bike
- Little BEAR buys a bike

Rhyming Books

The Story of Fred

- Use rhyme as a tool not as a tx objective

Talking about Speech Sounds during Book Sharing

There was a boy named Fred. He didn’t want to go to bed.

- What are the rhyming words?
- What is the first sound of Fred and bed?
- Let’s count the sounds in Fred and bed, get your fingers ready. Which is longer?
- I’m going to say the sounds of another word that rhymes with Fred and shed. /fr-E-d/
**Talking about Speech Sounds while Message Writing**

- Let’s write Happy Birthday Mom.
- What is the first sound in happy? I will write that.
- Let’s say all the sounds in happy. Fingers ready? /h-/ae-p-/i/ 4 sounds, I will write the letters.
- There should be 4 letters for 4 sounds, but writing is funny sometimes, 4 sounds, 5 letters!

**Critical Tx Features: RISE**

<table>
<thead>
<tr>
<th>R</th>
<th>Repeated Opportunities</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Intensity of scheduling</td>
</tr>
<tr>
<td>S</td>
<td>Systematic support</td>
</tr>
<tr>
<td>E</td>
<td>Explicit Skill Focus</td>
</tr>
<tr>
<td>+ Learner Factor: Attention, Motivation &amp; Engagement</td>
<td></td>
</tr>
</tbody>
</table>

**RISE+ in Book Sharing Tx**

<table>
<thead>
<tr>
<th>Repeated Opps</th>
<th>Isolate + segment 2 words / pg for 5 pgs = 20 opps</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intensity</td>
<td>Grps of 2-3 ch, 30 min/wk for 8-10 weeks</td>
</tr>
<tr>
<td>Systematic Support</td>
<td>Structural scaffolds: Rhyme to highlight form &gt; content; letters to represent phonemes; simple single skill games</td>
</tr>
<tr>
<td>Interactive scaffolds</td>
<td>Interactive scaffolds: Wait for answer, stress sound, give hand cues, model, expand part to full segmentation</td>
</tr>
<tr>
<td>Explicit Skill Focus</td>
<td>Focus on phonemic awareness over letters or vocabulary</td>
</tr>
<tr>
<td>+ Learner Factor</td>
<td>Children’s literature, clear link of skill to purposeful reading</td>
</tr>
</tbody>
</table>

**Guide to Task Order OR Task Support**

1. Visible and continuant consonants
   /m/, /b/, /n/, /l/…
2. Not visible but salient consonants:
   /g/, /nd/, /sh/, /ds/…
3. Word initial consonant clusters and tense vowels:
   /spl/, /sm/, /sk/, /l/, /l/…
4. Everything else
   /r/, /fl/, /f/, /sl/, /gl/, /tw/ /s/, /aw/, /ew/ /v/sk/, /v/nd/, /v/gz/

- In simple word shapes: CVC → CV, CVCV, CCVC → VC, CVCC
- Sometimes in challenging words: Teresa, Veronica, Nadia

**Two Effective Approaches to Phonemic Awareness Instruction**

1. **Skill Mastery** – Hierarchical vertically-ordered discrete single-skill phoneme tasks
   AKA Skill mastery, Clinician-directed
2. **Integrated Multiple Skill** – Cycled horizontally-ordered mix of contextualized and discrete phoneme tasks
   AKA Whole-part, Hybrid, Contextualized Skill

Both linked to print and spelling experiences
And with some form of classroom instruction
** Tx Reminders **

- Repeat, emphasize, or extend isolated consonants
- Isolated stop consonants impossible, but minimize following vowel to short schwa
- Have fun with long names but don’t expect accuracy
- **AGAIN, SOUNDS OF SPEECH NOT SOUNDS OF LETTERS** despite
  - Purpose is read and write not speak and listen
  - Teaching in a print context
  - Teaching along with sound-letter instruction

---

**Single Skill Vertical Tx Sequence**

<table>
<thead>
<tr>
<th>Week</th>
<th>Skill</th>
<th>Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rhyme</td>
<td>Bingo, odd-one-out</td>
</tr>
<tr>
<td>2</td>
<td>Initial phoneme</td>
<td>Bingo, matching, odd-one-out</td>
</tr>
<tr>
<td>3</td>
<td>Final phoneme</td>
<td>Bingo, matching, odd-one-out</td>
</tr>
<tr>
<td>4 &amp; 5</td>
<td>Phoneme blending</td>
<td>Drawing, singing, bingo; mainly 2-3 phoneme words; 4-phoneme and consonant clusters to extend students</td>
</tr>
<tr>
<td>6 &amp; 7</td>
<td>Phoneme segmenting</td>
<td>Drawing, singing, bingo; mainly 2-3 phoneme words; 4-phoneme and consonant clusters to extend students</td>
</tr>
<tr>
<td>8 &amp; 9</td>
<td>Phoneme manipulation</td>
<td>Letter cards and white board for manipulating letters and sounds in words to create new words</td>
</tr>
<tr>
<td>10</td>
<td>Review</td>
<td>Reviewed prior 9 wks with focus on phoneme segmenting and blending</td>
</tr>
</tbody>
</table>

---

**Multiple Skill Horizontal Tx Cycle**

<table>
<thead>
<tr>
<th>Session</th>
<th>Activities</th>
<th>Skills/Tasks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Open Skill Qn</td>
<td>a. What and why from one child</td>
<td>Highest proficiency in phoneme manipulation</td>
</tr>
<tr>
<td>b. Naming</td>
<td>b. Naming has one primary skill task</td>
<td>CMDtales with phoneme manipulation</td>
</tr>
<tr>
<td>c. Book</td>
<td>c. Book has four skill tasks</td>
<td>Phoneme manipulation literacy</td>
</tr>
<tr>
<td>d. One Game</td>
<td>d. Game has one primary skill task</td>
<td>Phoneme manipulation literacy</td>
</tr>
<tr>
<td>e. Close Skill Qn</td>
<td>d. Specific answer from each child</td>
<td>Phoneme manipulation literacy</td>
</tr>
</tbody>
</table>

---

**Vertical vs Horizontal Task Order**

**Vertical:**

```
/b/ \-+\-a\-+\-b-a-d/
```

- Single subskill or task focus
- Contrived, controlled tasks
- Ordered in difficulty
- Mastery of each task before the next
- Minimal instructor support during task

**Horizontal:**

```
/b/ \+\-a\-+\-b-a-d/
```

- Multiple subskill or task foci
- Purposeful, complex tasks
- Varied difficulty
- Varied performance across tasks
- Interactive scaffolding matched to need

---

**Why Horizontal?**

- Vertical discrete skill is conventional approach that is simpler to execute and collect data in structured, contrived games
- Horizontal requires a skilled clinician to dynamically scaffold child in purposeful and complex activities

**Why I Like Horizontal**

- Alternative to vertical
- Less advance planning
- Learned more like in daily life
- Taught like other language skills
- Allows child self-regulated learning
- Allows SLP to respond to need in the moment
- Allows variation in level within a group
- Links to use in books and message writing
- More interesting for everyone
Scaffolding Phonemic Awareness

- Dynamic interactive individualized instructional moves
  - Support active learning
  - Lead to greater independence
  - Init activity beyond current independent performance
- Horizontal ordering
  - Integral part
  - From imitation to independence
- Vertical ordering
  - Light scaffolding possible
  - Heavy to moderate indicates need to back up

Scaffolding Phoneme Isolation

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>Isolate and exaggerate phoneme in isolation and in the word, point to mouth and tell children to look, say the correct response, elicit response from child. What is the first sound in milk? Watch my mouth, /m/m/m/m/milk. You say /m/.</td>
</tr>
<tr>
<td>Moderate</td>
<td>Isolate phoneme and exaggerate, point to mouth and tell children to look, exaggerate phoneme in word (use two or more depending on need). What is the first sound in milk? /m/m/m/m/milk? (point to mouth).</td>
</tr>
</tbody>
</table>

Scaffolding Beyond The First Attempt

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Scaffolding:</td>
<td>SLP: Okay Amanda, here’s another one for you. What’s the first sound, Amanda, look at me. What’s the first sound in dare? A: Don’t you dare! SLP: What’s the first sound in dare? A: /g-g-g/ SLP: Look at my mouth -- /d-d/ A: D SLP: D is the letter. The sound is /d/ A: /d/ SLP: Good job! /d/ is the first sound in dare</td>
</tr>
</tbody>
</table>

Scaffolding Segmenting

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heavy</td>
<td>Isolate and raise finger for each phoneme in the word. The child copies and counts. Confirm correct number, repeat segmented sounds. The word is red. Get your fists ready to count the sounds. /r/ (raise one finger) Say the sounds with me. /e/ (raise second finger). Yes, /e/ /d/. How many sounds? Count my fingers. Right three sounds. /r/ /e/ /d/</td>
</tr>
<tr>
<td>Moderate</td>
<td>Get mouth ready for first phoneme, but pause for children to say it, raise finger, then mouth sound but pause for the other phonemes. Have child tell how many phonemes. The word is red. Get your fists ready. You say the sounds this time (mouth /r/ and raise finger). /e/ (raise finger), /d/ (raise finger)? Yes, /r/ /e/ /d/. How many sounds?</td>
</tr>
</tbody>
</table>

Arriving at Independent Segmenting

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>Get the mouth ready to say each phoneme. Raise finger for each phoneme. Say aloud only the middle sounds. The word is red. Get your fists ready. (mouth the sound /r/), /e/, (raise fingers), (mouth /d/). Yes, /r/ /e/ /d/. How many sounds?</td>
</tr>
<tr>
<td>None</td>
<td>Ask the question. Say the sounds in red.</td>
</tr>
</tbody>
</table>

Arriving at Independence for Isolation

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light</td>
<td>Emphasize beginning phoneme in the word. What is the first sound in milk?</td>
</tr>
<tr>
<td>None</td>
<td>Ask the question. What is the first sound in milk?</td>
</tr>
</tbody>
</table>
Scaffolding Segmenting a Simple Word

Light Scaffolding, Simple Word:
SLP: How many sounds are in the word the? Show me the sounds. Tap my fingers and show me.
J: /th-e/
SLP: Yes! /th-e/, /th-e/. Two sounds.

Scaffolding Segmenting a Hard Word

Light Scaffolding, Complex Word:
SLP: What’s the next word?
J: Titanic
SLP: Titanic! That has a lot of sounds in it. What do you think the first sound is?
J: /T-i-tan-i-c/ (sticks out five fingers as he says sounds).
SLP: Good! You counted most of the sounds.
J: There’s five sounds.
SLP: Okay, that was good for such a long word.

Scaffolding Tips for Young Children

• In the zone
  – Enough help for success with effort; vary effort vs success
  – Recognize partial and increasing correctness
• Blending – Closed choices with rhyming/pictures/objects
• Segmentation
  – Mouth and finger assists segmentation
  – Present the correct model but accept approximations
  – For preschoolers, aim is idea of phoneme segmentation and embedded isolation opps

Initiating Speech Sound Awareness

• Listening practice, but on phonemes
• Becoming aware of mouth and ear
• Isolated phoneme practice, but tied to word context
• Choral and individual, for a few minutes
• First sound in my name, Teresa, /t-t-t-t-t/ (point to my mouth) everyone say this together...
• Use salient phoneme contrasts – /p/ vs /s/ vs /n/

How Much – The Teaching Episode & Tx Dosage

• To determine intensity, think about drug dosages
• Active treatment element in its minimal unit
  – Teaching episode = Initiation+Response+Evaluation
• A dosage framework (Warren, Yoder, & Fey, 2007)
  – Dose: 1 session
  – Form: Nature of activities in session
  – Strength: Number of episodes in 1 dose
  – Frequency: Number of doses per week
  – Duration: Number of weeks of does
  – Total intensity: Duration x Frequency x Strength

How Much?

For 3 months? 2 years?
15 min a week? 60 min a week?
Phonemic Awareness Tx

Beyond the Basic IRE Episode

- IRE plus
  - Clinician model without response
  - Peer response heard as model
  - Choral response belonging to whom?
- Multiple task episodes
  - Let’s see if sun and slow match. What is the first sound in sun? [match + isolate]
  - Let’s say the all the sounds in sun. You start, the first sound is — [segment + isolate]
  - What am I holding in this bag? /P-i-ch/. Peach. Your turn. You say the sounds in the next word and I will guess. [blend + isolate]

Intensity Evidence to 2001

- Large number of controlled studies have obtained significant and large gains
- Intensity has varied considerably:
  - Session lengths of 15 to 90 minutes
  - Frequencies of 1 to 5 times weekly
  - Durations of 4 to 32 weeks
  - Individual, group, and whole class arrangements
  - Learners from 4 to 8 years, of a range of abilities
- No report of number of teaching episodes
- Rarely treatment fidelity or child attendance info

Ehri et al. (2001) Meta-Analysis

- Part of NRP (2000)
- Evidence for phonemic awareness treatment effects
- 52 studies with 96 treatment-control comparisons reviewed
- Mixed pre-phonemic and phonemic
- Results:
  - Small group better than individual or whole class
  - Typical learners had larger gains than weaker learners
  - 1-2 tasks better than 3+ phonemic/pre-phonemic tasks
  - 5 to 18 hours best, with no difference in this span

Intensity — How Much Tx? Depends on How

- The long way: 6 months if full phonological spectrum, whole K class 15-min daily instruction (24 hrs):
  - Brady et al. (1994), moderate gains on segmenting: \( d = 0.57 \)
- The short way: 7 weeks if phoneme-level only, small K groups, 3-4x/wk 20-30 min instruction (12 hrs):
  - Ball & Blachman (1988): Say-it-and-move it blank/letter tiles; Segmenting: vs no-tx & letter tx, \( d = 1.85, d = 1.67. \)
  - Ukrainetz et al. (2000): Sound talk embedded in rhyming books and shared writing activities; Segmenting: \( d = 1.37 \)

Tx Intensity for Children with Language Impairment

- 7 controlled group studies at phoneme level (incl. rhyme) for 4-7 yr olds
- 4 included other speech/language objs
- Individual or small group, 3-20 hrs
- Best results for 12-20 hours, large segmenting effect \( (>d = 1) \)

Does the Old Evidence Still Apply?

- Studies until recently contrasted phonological awareness tx to regular classroom instruction with
- BUT now...
  - One of the 5 pillars of reading (NRP, 2000)
  - Part of K-1 standardized reading dx (DIBELS)
  - Often taught in RTI and in classroom
  - Primarily at the phoneme level in K
- So how much is enough for tx with classroom phonemic awareness instruction?
A Study of Intensity

Ukrainetz, Ross, & Harm (2009)

- 41 5-6 year old kindergartners, including 22 English learners, with low letter and first sound knowledge on DIBELS
- 11 hours of phonemic awareness treatment:
  - Concentrated (CP, 3x/wk, Oct - Dec)
  - Dispersed (DP, 1x/wk, Oct to March)
  - Vocabulary control (CON, 1x/wk to March)

Ukrainetz, Ross, & Harm (2009)

What is the effect on phonemic awareness and nonsense word reading of supplementary phonemic awareness instruction concentrated in the fall compared to dispersed through the year for at-risk Ks?

- 41 Ks: low letter & first sound knowledge on DIBELS, incl 22 ELL
- 11 hours of phonemic awareness tx:
  1. Concentrated (CP, 3x/wk, Oct - Dec)
  2. Dispersed (DP, 1x/wk, Oct to March)
  3. Vocabulary control (CON, 1x/wk to March)
- Effects in December of more tx
- Effects in April of different distribution of tx

Dose Form

<table>
<thead>
<tr>
<th>Order</th>
<th>Horizontal</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tasks</td>
<td>First isolate, last isolate, blend, segment</td>
</tr>
<tr>
<td>Activities</td>
<td>Name, picture, object, book, &amp; writing activities (fingers for segmenting)</td>
</tr>
</tbody>
</table>

Dose Strength

| Grouping | 1 children |
| Session length | 30 minutes |
| Episodes (IRE +) | ≥ 5 per task per child = 20 |
| Listening to 1/2 the 40 peer models |
| Session dose = 40 episodes |

Dose Frequency & Duration

| Frequency | 1 or 3 |
| Duration | 8 or 24 weeks |
| Total time | 12 hours of tx |
| Total intensity | 960 teaching episodes |

Effect of Intensity on Phonemic Awareness
Results of Ukr&al (2009) Intensity Tx Study

- Over a school yr, for SLP tx and classroom instruction
- Most improved into the normal range
- A few still below expectations; rec’d for sped dx
- English learners = native English speakers
- Short intense tx = long weekly tx
- At-risk Ks, esp mild deficits, improve a lot with only classroom instruction and incidental self-regulatory gains from tx for another area

Recommendations for Phonemic Awareness Intensity

- Total intensity
  - 5-18 hours for typical ch
  - 12-20 hours for ch w/ language impairment
- Most of this in the regular classroom
- Additional tx?
  - 8 sessions of 20 episodes per child?
  - 5 episodes per child in tx sessions on other goals over 24 sessions?
  - An additional boost for our kids, but not a lot

Spend the time you save on increasing intensity for other language skills

Phonemic Awareness in Summary

1. Tier I and II -- teachers handling phonemic awareness
2. Tier III -- SLPs, but strategically and efficiently
3. Teach at the phoneme level
4. Teach isolating, blending, and easy segmenting
5. Do not teach students to listen really hard
6. Use both drill-game and purposeful print activities
7. Use RISE+ in all tx activities
8. Use vertical or horizontal ordering
9. Match scaffolding to child need and task difficulty

*A little quality tx will go a long way for this teachable skill*

Saying the Words – The Production Part of Phonological Processing

- Not sig part of phonological processing deficits
  - For ch with sig speech sound disorders, 1/3 show comprehension deficits and 3/4 production deficits (Shriberg & Kwiatkowski, 1994)
  - BUT low co-morbidity (<2%) for Ks ideed with language impairment (Shriberg et al., 1999)
  - If only phonological disorder, not sig predictor of later reading problems
  - BUT LI and RD show mild difficulties with multisyllabic pronunciation (Goffman, 2004; Munson et al., 2005)
  - And oral & limb motor coordination (Zelaznik & Goffman, 2010)

Phonological Processing Tx Need

- Word-reading problems
- Persistent trouble on phonemic awareness compared to peers
- Low on auditory memory and rapid automatized naming (CTOPP)
- Spelling may be conventional for most words but student gets lost in multisyllabic words
  - decious, delicious
  - calamity, calamity
- Watch student spell. Spelling process shows forgetting and repeated tries even if answer correct

The Rest of the Story of Phonological Processing Tx

Deficits underlying most reading disabilities (aka dyslexia)

1. Phonemic awareness
2. Phonological working memory
3. Phonological code retrieval (wordfinding)
And #4, Phonological Production?
A Fancy Task Program

Lindamood Phoneme Sequencing Program (LIPS, Lindamood & Lindamood, 1998):
- Structured hierarchical procedure with step-by-step tasks and prompts
- Blocks and letter-blocks represent phonemes in nonsense & real words
- Initiate with articulatory phonetics instruction on distinctive features (stop, fricative, alveolar)
- Invented vocabulary for articulators (tip tapper, lip pepper, skinny air)
- Often extended time of 1+ years
- Phonemic awareness, letter-sound correspondence, auditory memory, word retrieval, conventional spelling

But Maybe Intense Quality Tx More than LiPS?

- Reading
  - day for 8 wks
  - rate improved, 40% no longer SPED
- Language: Gillam et al. (2008)
  - Computerized or SLP tx for 6-9yr SLI: individ 100 min/day for 8 wks
- For all txs, big changes in standardized lang measures incl phonemic awareness & auditory temporal proc

Phonological Memory Intervention

- Advanced phonemic awareness segmentation, substitution, and deletion "work-outs"
- As a way in to less-accessible components of phonological processing?
  - With or w/o color-coded tiles and letters
  - Require sustained attention, memory, retrieval and problem-solving
- What about Pig Latin?
- Memory and rapid naming drills?
- Specialized computer training software?

Pig Latin

- Take first consonant or consonant cluster of English word, move it to end of word and add suffix ay [ei]
  - pig → igpay
  - banana → ananabay
  - truck → ucktray
  - happy → apphyay
- For words that begin with vowel sounds or silent letter, "way" or "yay" or "ay" added at word end
  - egg → eggway
  - inbox → inboxway
  - Iway antway oatway ieipay oastay ithway amjay

Emerging Positive Evidence for Memory Tx

Maridaki-Kassotaki (2002)
- Randomly assigned 120 6-9 yr Greek ch to tx & no-tx control
- Tx: Non-word repetition exercises for 15-min, 4 days/wk, 7 mos
- Results: Significantly better non-word rep and reading

Garcia-Madruga et al. (2013)
- Randomly assigned 31 Spanish 8-9yr to tx & control
- Tx: Drills on attn focus, attn switching, using prior knowledge, semantic updating in working mem, & inhibition
- Results: Sig better IQ scores, reading compre, and working memory

CogMed Dual n-back Training

- n-back task: Listen to or look at stream of letters or numbers and decide if item matches one that occurred a designated number of items earlier
  - 2-back: 1-4-5-7-2-7-2 3-6-8-6
  - Dual version, participants look at and listen to different sequences simultaneously
- Tx involves moving incrementally from 1-back to 2-back and so on
- Claims to improve memory and intelligence
- See www.soakyourhead.com
Promising But...

- Controlled studies → improvements in attention, working memory, and reading (Gillam & Gillam, 2010; Holmes et al., 2009, 2010)
  - BUT with no-tx comparisons, D кры active tx features (e.g., greater monitoring and encouragement)
  - D крыш outcomes for other txs with mental rehearsal and manipulation
  - D крыш changes maintain and generalize to academics
- D крыш is changing (Holmes et al., with 8-11 yr olds)
  - Capacity or control of attention & strategy use?
  - Majority reported concentrating harder to improve perf (e.g., close eyes, rehearse items, and trace patterns with eyes)

Other Routes To Improving Memory?

- Other ways to improve daily life performance (Boudreau & Constanza, 2011)
  - Language skills, knowledge base, learning skills...
  - You remember better with foundational understanding and awareness of task purpose
- Berninger et al. (2008): for 4th to 6th graders with reading disability,
  - Explicit orthographic and morphological training improved pseudo word reading and real word spelling
  - But hands-on, engaging problem-solving science instruction improved phonological working memory

Phonological Code Retrieval

- Accurately and quickly accessing the phonological code representing the meanings of known words
  - AKA word retrieval, word-finding, rapid naming
  - In spoken language expression and in fluent reading
- Double Deficit Source for RD: Combo of difficulties in phonological awareness and phonological code retrieval (Wolf & Bowers, 1999)
- Central phonological retrieval component
  - But also taps attentional, perceptual, memory, lexical, and articulatory elements

Phonological Retrieval Tx's

1. Improve word depth and elaboration in traditional semantics treatment
2. Use phonological and semantic cues to aid word retrieval
3. Teach children how to cue and organize themselves
4. Rapid naming drills for letters, digits, objects

Effects of Rapid Naming Tx on Retrieval

- Improves accuracy and latency of word retrieval in confrontation naming tasks (McGregor & Leonard, 1995)
  - BUT little generalization to untrained words (e.g., Bragg et al., 2012)
  - And none to communicative and reading tasks
- Rapid letter naming tx's show immediate increase in letter naming speed and reading fluency
  - BUT improvements temporary or require additional orthographic training (Kirby et al., 2010)
- But rapid naming performance can improve somewhat as a result of reading intervention (Torgesen et al., 2010)

In Sum – Phonological Processing Tx

1. Tx can improve memory performance
  - Qns re: critical tx elements, what is being improved, and whether improvements maintain and generalize
2. Retrieval performance strongly resistant to cueing & rapid naming tx
  - Improve language and reading skills, which then improves retrieval
3. Keep phonemic awareness focused and efficient
  - Phoneme-level awareness tx linked to reading and writing

All with RISE+
Phonemic Awareness References


Phonemic Awareness Tx

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