Word Study Intervention: Multilingualistic Techniques for Promoting The Strands for Language Literacy Success

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We have no relevant financial or nonfinancial relationship(s) within the products or services described, reviewed, evaluated or compared in this presentation.
1. Define Multiple-Linguistic and Word Study Links to Core Standards

2. Brief Multiple-Linguistic Dx

3. Phonological Awareness Tx

4. Orthographic Knowledge Tx

5. Morphological Tx
1. Literacy (reading, writing, spelling) is written language and thus within SLP’s scope of practice (ASHA)

2. Assessing and treating the underlying linguistic components of literacy is the SLP’s challenge
Strands of Word-Level Reading /Spelling (Adapted from Scarborough, 2003)

- Spoken Language
- Vocabulary/Semantics
- Phonological Awareness (PA)
- Morphological Awareness (MA)
- Orthographic Knowledge (OK)
- Mental Graphemic Representations (MGRs)
Multiple Linguistic Factors

**Reading and Spelling**

**Phonological Awareness**
The metalinguistic awareness of all aspects of phonological structure of sounds

**Orthographic Knowledge**
The information about
- sound –symbol correspondences (/tʃ/ spelled “ch”),
- letter patterns (long/short vowel rules),
- phonetic constraints (no “ck” at word beginnings)
- Includes Mental Graphemic Representations

**Morphological Awareness**
The awareness of meaningfully parts of speech:
- **Inflectional** – Change tense, plurality, (swim-swimming)
- **Derivational** – Change word class (teach –teacher)
A linguistically-based instruction which focuses on sounds, letters, and meaning within words and includes self-discovery of patterns.
Spelling can be a window to underlying linguistic breakdowns

- If child spells “their”: there (semantic breakdown)
- If child spelled magician - “magushun” (morphological breakdown)
- If child spells “cat”:
  - Mzlnj (phonological breakdown)
  - Cet (orthographic breakdown)
  - Kat (mental graphemic representation breakdown)
Children read spellings, spell spellings, and read the spellings of words they have spelled.

Highly correlated (.68-.86)

Both are language skills

Both follow similar developmental patterns

Both tap into similar knowledge sources (PA, MA, OK, MGR, SEM)

Teaching spelling improves reading skills (Ellis & Cataldo, 1988; Ehri & Wilce, 1987)

Spelling is the more “stringent” measure of the literacy-related skills. It requires attention to conventional form, not just a plausible spelling.
Intervention Links to Core Standards
Treatment Linked to Standards

Treatment goals can be linked to national or state academic standards and benchmarks.

These standards are in the areas of reading, writing, vocabulary and language.
Language

• Using standard English in formal writing and speaking
  ▪ Determining word meanings and word nuances
  ▪ Acquiring general academic and domain-specific words and phrases
Reading

• Foundational Skills
  • Print concepts (K−1)
  • Phonological awareness (K−1)
  • Phonics and word recognition (K−5)
  • Fluency (K−5)

• Reading Comprehension
  • Balance of literature and informational texts

Writing

• Writing informative/explanatory texts
• Writing narratives
Common Core Standards

- http://www.corestandards.org/the-standards

IPAD APP:

- *EZ Common Core* at the App. store
Assessment

Phonological Awareness
- CTOPP (Comprehensive Test of Phonological Processing)
- PALS (Phonological Awareness Literacy Screening)
- PAT2 (Phonological Awareness Test-2)
- Spelling Sample

Orthographic Knowledge
- WRMT-III (Woodcock Reading Mastery Test-III)
- Orthographic Coding Task (Olsen et al., Spelling Sample)

Morphological Awareness
- TOLD P:4 (Test of Language Development, Primary:4)
- Sentence completion task
- Language sample
- Spelling Sample
Multiple-Linguistic Spelling Analysis

If a sound/phoneme is not represented with any letter/grapheme = Phonological Awareness Error

Within a base/root word, if the incorrect letter or letter sequence occurs or a spelling pattern is not observed (within-word doubling, long vowels) = Orthographic Knowledge Error

If an affix is missing, spelled incorrectly, or its addition to the base word is not appropriately modified OR If a derived word form does not appear to utilize knowledge of the base word or another derived form in its spelling = Morphological Awareness Error

If a word is spelled phonetically correct, and no orthographic pattern or morphological rule governs the spelling = Mental Graphemic Representation Error

<table>
<thead>
<tr>
<th>Practice Items</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>Pup – pump</td>
<td>PA</td>
</tr>
<tr>
<td>not – note</td>
<td>OK</td>
</tr>
<tr>
<td>Peaches – peaches</td>
<td>MA</td>
</tr>
<tr>
<td>Cutting – cutting</td>
<td>MA</td>
</tr>
<tr>
<td>Carful – careful</td>
<td>MA, MGR</td>
</tr>
<tr>
<td>Wat – what</td>
<td>MGR</td>
</tr>
<tr>
<td>Noat – note</td>
<td>MGR</td>
</tr>
<tr>
<td>Chal – trail</td>
<td>PA, OK</td>
</tr>
<tr>
<td>pleser- pleasure</td>
<td>OK, MA</td>
</tr>
</tbody>
</table>
Word Study Instruction and Intervention
Intervention/Instruction Principles

Repetition

Numerous opportunities for students’ self-discovery of spelling patterns and rules (Hall, Cunningham, & Cunningham, 1995; Joseph, 2000)

Directed

Direct, focused attention to the properties of both spoken and written language (Berninger et al., 2003)

Link to Function

Plenty of opportunities for text-level writing (use teachable moments - but WRITE, don’t just spell aloud)
Self discovery approaches often involve word analysis and word sorting activities.

- Students are encouraged to search for, or sort by, specific patterns or spelling rules.
  - Students then use this knowledge to guide the spelling of other words that follow the same patterns and rules.
Studies of instruction targeting multiple linguistic factors suggest promise to spelling improvement and reading improvement (Apel & Masterson, 2001; Kelman, Wolter, & Apel, 2003; Masterson & Crede, 1999; Wolter & Green, in press; Wolter, 2005; in preparation)
Specific phonological skill of phonemic awareness is the strongest predictor of spelling and reading success (National Reading Panel (NRP), 2000).

Phonemic awareness instruction is significantly related to positive spelling and reading outcomes (Ehri et al, 2001; NRP, 2000).

For children with literacy deficits, the greatest gains by students third grade and below (Blachman, Schatschneider, Fletcher, Francis, Clonan, Shaywitz, & Shaywitz, 2004; Schuele, Justice, Cabell, Knighton, Kingery, & Lee 2008; Vadasy, Sanders, & Peyton, 2006).
Phonological Awareness Instruction
Principles of Good Phonological Awareness Instruction

- Explicit and systematic
- Linked to spelling and reading tasks
- One or two-skill focus instruction (rather than multi-skill focus) results in stronger phonemic awareness skills and applied spelling and reading outcomes
- Teaching phoneme-grapheme correspondences produced effects twice as great as phoneme only

(Ehri et al., 2001; National Reading Panel, 2000; see Wolter & Squires, in press, for summary)
Go from easy to hard in the following areas:

1. The size of the phonological unit
   - (sentences to words to syllable to phonemes/sounds)

2. The number of phonemes in words
   - (shorter words are easier than longer words to segment)

3. Position of the phoneme
   - (initial consonants are easiest to delete/segment than final, which are easier than middle)

4. The size of the phonological unit
   - (sentences to words to syllable to phonemes/sounds)
- Elkonin boxes
- Minimal pairs
  - "bat" – "pat"
- Letter tiles / Links to writing
  - "ot" – "hot" – "shot" – "shots"
Orthographic Knowledge Instruction
Orthographic Knowledge: The Research

- Reading and spelling improves when children engage in activities that help them discover the differences in word patterns (Abbott, 2001; White, 2005; Williams & Hufnagel, 2005; Williams & Lundstron, 2007; Williams & Phillips-Birdsong, 2006).

- Orthographic pattern word-study instruction improves the spelling and reading abilities of children with language and literacy deficits (Apel & Masterson, 2001; Berninger et al., 2002; Berninger, et al., 2008; Graham & Harris, 2005; Kelman & Apel, 2004; Masterson & Crede, 1999; Wolter & Dilworth, in preparation).

- At times, spelling instruction needs to focus on strategies for developing clear and complete MGRs (Ehri, 2005; Shahar-Yames & Share, 2008).
Principles of Good Orthographic Knowledge Instruction

- Teach students to analyze syllables
- Provide immediate feedback and insist on correction
- Encourage repetition of correct spelling until MGR is firmly established
- Teach children to identify patterns
- Provide explicit training in word spelling rather than overall training in vocabulary.

(see Wolter, in press and Wolter & Squires, in press, for summary)
Word Sort (Bear et al., 2004)

- lick
- like
- tack
- take
- sock
- soak

- snake
- peck
- peak
- duke
- snack

- lick
- tack
- sock
- peck
- duck
- snack

- like
- take
- soak
- peak
- duke
- snake
Long – o
spelled oa

This is a something you wear when you are cold.
What is a __________________?  coat

This is something that is like a frog and it croaks.
What is a __________________?  toad

Long – o
spelled o_e

This is what you write when you write down a phone message.
What is a __________________?  note

This is something that a bog chews.
What is a __________________?  bone

Short-o
Spelled o

This is something you sleep on when you go camping…
What is a __________________?  cot

This is a type of pig that is really big.
What is a __________________?  hog

Sample Game Format Following Orthographic Word Sort of spelling rule (long- versus short-I spelling) (adapted from Bear et al., 2004, see Wolter, in press)
1. Encourage self-discovery of patterns (Bear et al., 2004)
2. Target contrasting patterns
3. Following discovery of patterns, explicitly label the pattern
4. Establish key words for Word Walls
5. Practice new pattern in writing tasks
Further Activities

- Word Sort
- Backwards Spelling
- Cover, copy, compare
- Analogy
MORPHOLOGICAL AWARENESS INSTRUCTION
Four recent systematic reviews of morphologically-based instruction revealed it to be effective in improving reading and reading for all abilities K-9th grade.

Instruction that best facilitates spelling & reading success focused on developing ability to segment, blend, and classify words by morphological components.

(Bowers, Deacon & Kirby, 2010; Carlisle, 2010; Goodwin & Ahn, 2010; Reed, 2008)
<table>
<thead>
<tr>
<th>Tests</th>
<th>Pre-test</th>
<th>Post-Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>PPVT-4</td>
<td>93&lt;sup&gt;a&lt;/sup&gt;</td>
<td>103&lt;sup&gt;a*&lt;/sup&gt;</td>
</tr>
<tr>
<td>WRMT-R Word ID</td>
<td>96&lt;sup&gt;a&lt;/sup&gt;</td>
<td>98&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>WRMT-R Word Attack</td>
<td>93&lt;sup&gt;a&lt;/sup&gt;</td>
<td>93&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>WRMT-R Passage Comp</td>
<td>90&lt;sup&gt;a&lt;/sup&gt;</td>
<td>96&lt;sup&gt;a*&lt;/sup&gt;</td>
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<tr>
<td>TOSWRF</td>
<td>94&lt;sup&gt;a&lt;/sup&gt;</td>
<td>96&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>TWS-4</td>
<td>77&lt;sup&gt;a&lt;/sup&gt;</td>
<td>79&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>CTOPP</td>
<td>8&lt;sup&gt;b&lt;/sup&gt;</td>
<td>11&lt;sup&gt;b*&lt;/sup&gt;</td>
</tr>
<tr>
<td>Morphological Receptive</td>
<td>33&lt;sup&gt;%c&lt;/sup&gt;</td>
<td>67&lt;sup&gt;%c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Morphological Production</td>
<td>33&lt;sup&gt;%c&lt;/sup&gt;</td>
<td>67&lt;sup&gt;%c&lt;/sup&gt;</td>
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*Note.* <sup>a</sup> Standard score, based on a mean of 100, standard deviation of 15,  
<sup>b</sup> standard score, based on a mean of 10, standard deviation of 3,  
<sup>c</sup> percentage correct.*Substantially or clinically significant improvement denoted by non-overlapping SEMs.
All children significantly improved in spelling and reading

Main Effects for:
- Sight-Word Reading $F (1,18) = 9.19$, $p < .05$, $\eta_p^2 = .34$
- Reading Decoding $F (1,18) = 20.98$, $p < .05$, $\eta_p^2 = .54$

For children morphological awareness instruction

Significant improvement in
- Reading comprehension $F (1,18) = 6.89$, $p < .05$, $\eta_p^2 = .28$
- Spelling $F (1,18) = 5.02$, $p < .05$, $\eta_p^2 = .22$
- Morphological Awareness $F (1,18) = 33.47$, $p < .05$, $\eta_p^2 = .65$
Morphological Awareness Instruction

- Instruction in changing meaning and how morphology can help
- Can incorporate with other codes (phonological, orthographic)
- Repeated practice with newly learned information
- Application of newly-learned skills in functional reading and writing contexts
Principles of Good Morphological Awareness Instruction

- Focus is on applying morphology as a strategy
- Discovery of patterns via word sorts, word building, and instruction on word origins
Morphological Awareness: Inflectional

- Heighten awareness for inflectional morphology
- Link meaning between words
- Identify relationships
- Target correct spelling of inflections
- Target inflectional spelling patterns
- Contrast inflected vs. non-inflected word endings
<table>
<thead>
<tr>
<th>helped</th>
<th>canned</th>
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<tbody>
<tr>
<td>raked</td>
<td>plodded</td>
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<tr>
<td>tricked</td>
<td>sipped</td>
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<tr>
<td>grinned</td>
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</table>
## Morphological Awareness Word Sort

<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>Spelling - ed</td>
<td>helped</td>
<td>plodded</td>
<td>grinned</td>
</tr>
<tr>
<td>versus</td>
<td>tricked</td>
<td>needed</td>
<td>canned</td>
</tr>
<tr>
<td>Sounds</td>
<td>sipped</td>
<td></td>
<td>raked</td>
</tr>
<tr>
<td>/t/,/Ed/,/d/</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>hopped</td>
<td>fighting</td>
<td></td>
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</tr>
<tr>
<td>tapping</td>
<td>tapping</td>
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<tr>
<td>added</td>
<td>hoped</td>
<td></td>
<td></td>
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<tr>
<td>fitting</td>
<td>aided</td>
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<td></td>
</tr>
<tr>
<td>Category</td>
<td>Double</td>
<td>Single</td>
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<td>-----------------</td>
<td>---------</td>
<td>---------</td>
<td></td>
</tr>
<tr>
<td>Doubling</td>
<td>hopped</td>
<td>hoped</td>
<td></td>
</tr>
<tr>
<td>Long</td>
<td>tapping</td>
<td>tapping</td>
<td></td>
</tr>
<tr>
<td>versus</td>
<td>fitting</td>
<td>fighting</td>
<td></td>
</tr>
<tr>
<td>Short vowel</td>
<td>added</td>
<td>aided</td>
<td></td>
</tr>
</tbody>
</table>
Morphological Awareness: Derivations

- Heighten awareness for derivational morphology
  - Link meaning between words
  - Identify relationships
  - Target correct reading/spelling of derivations
  - Identify commonalities among base words and derived forms
  - Control for transparency of derivational forms
Tasks may include (e.g., Apel & Masterson, 2001; Berninger et al, 2003; Wolter, 2005; Wolter, in press; Wolter & Green, in press):

- Word building: given cards with prefixes, affixes or roots, combine to make or recognize word (un+clear, salt+y)
- Word generating: given affix, generate a word
- Morpheme finding: find roots and affixes in texts
- Word sorts (e.g., similar spelling, dissimilar purpose – corner, reader)
- Recognition of “family members”
<table>
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<tr>
<th></th>
<th>(in blue)</th>
<th>(in green)</th>
<th>(in red)</th>
</tr>
</thead>
<tbody>
<tr>
<td>anti-</td>
<td>(against)</td>
<td>-ped (to walk)</td>
<td>-ology (study of)</td>
</tr>
<tr>
<td>micro-</td>
<td>(small)</td>
<td>-act- (to do)</td>
<td>-ion (state of being)</td>
</tr>
<tr>
<td>un-</td>
<td>(not)</td>
<td>-dict- (to say)</td>
<td>-ness (state of being)</td>
</tr>
<tr>
<td>re-</td>
<td>(repeat)</td>
<td>-mot- (to move)</td>
<td>-or (doer)</td>
</tr>
</tbody>
</table>

(See Wolter, in press; Wolter & Green, in press)
Family Members Can:

- Look or Sound Alike and Be Related
  - swim – swimming
  - slip – slipped

- Look or Sound Different and Be Related
  - divide – division
  - explode - explosion
  - magic – magician

OR

- Look or Sound Alike but NOT Be Related (friends)
  - car-carrot
  - luck-cluck

Are teacher and teach related?
Are mother and moth related?
Are clinician and clinic related?
Are brother and broth related?

(See Wolter, in press; Wolter & Green, in press)
swim - swimming

five - fifth

pill - pillow

teach - teacher

magic - magician

ten - tent

walk - walked
<table>
<thead>
<tr>
<th>en</th>
<th>ier</th>
<th>est</th>
<th>rest</th>
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<tbody>
<tr>
<td>cleaner</td>
<td>emptier</td>
<td>kindest</td>
<td>earliest</td>
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<tr>
<td>kinder</td>
<td>trickier</td>
<td>cleanest</td>
<td>emptiest</td>
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<td>fancier</td>
<td>largest</td>
<td>trickiest</td>
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<td>harsher</td>
<td>crummiest</td>
<td>strangest</td>
<td>fluffiest</td>
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<tr>
<td>bigger</td>
<td>fluffier</td>
<td>biggest</td>
<td>funnyest</td>
</tr>
<tr>
<td>cutter</td>
<td>tastier</td>
<td>cutest</td>
<td>rasliest</td>
</tr>
<tr>
<td>butter</td>
<td></td>
<td></td>
<td>funnyest</td>
</tr>
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Pull together

- Spelling and reading are multiple-linguistic skills
- Focusing on the linguistic underpinnings through word study may help to improve literacy skills
- Relevant to Core Curricular Standards
- Work with classroom teachers and team to address different linguistic components


References


