Speaking and Signing English with Deaf Students: Morphemic Awareness and Reading Comprehension

NERA 2015 SEE w/Deaf: MA & Reading

10/22/15

Today I will present a research study...

• ... on how explicit attention to the morphemes of words can foster the reading achievement of Deaf/hard of hearing (D/HH) students...

First, some background:
Historically,

- D/HH students do not achieve the same level of reading achievement as their hearing peers (Spencer & Marschark, 2010).
- Cochlear Implants have not closed the gap for D/HH students (e.g. Spencer & Marschark, 2010).
- the early linguistic gains of young CI users dissipated at higher grade levels and
- reading achievement continues to plateau around the fourth grade level when students reach the intermediate-grades through high school years (Gears et al., 2007; Spencer & Marschark, 2010; Trader, 2000).

Potential reasons for plateau...

- Difficult for D/HH students to hear grammatically-accurate English, especially pronouns, articles and bound morphemes of English (Guo, Spencer & Tabbush, 2013).
- Reading materials progressively get more difficult, words get longer and the demands of vocabulary increase; making comprehension more challenging (Carlisle, 2004; RAND Reading Study Group, 2002).

Morphemes: Common in Text

Luetke (2013) analysis of basal stories (Harcourt, 2001)

1st Grade: 10 bound morphemes:
  - dis-, -ed, -en, -y, -ful, -ing, plural -s, possessive -s, third person -s, and -y
3rd Grade: 21 additional:
  - -able, -an, -ant, -en, -er, -ible, -ic, -ice, in, -ion, -ious
  - -its, -ity, -ment, mis, -or, -re, -sion, -th, -tion, and un...
5th Grade: 9 additional - all derivational

And

- Difficult to hear (Easterbrooks, et al., 2008)
- No access unless fingerspelled or signed during instructional and social conversations (Luetke, 2013)

Instructing MA

Morphology “relates differently to reading and writing in different languages... Nonetheless across languages, the central role of morphemes in word formation and lexical processing constitutes an initial argument for the potential value of instruction in morphological awareness” (Carlisle, 2010, p. 485).

Explicit morphology instruction = Significant gains for:

- Hearing students (see Carlisle, 2010 for review)
- ELLs (e.g. Leotta, Kieffer, Faller, & Kelley, 2001)
- D/HH students (Bow, Blamey, Paatsch, & Sarant, 2004)
Access to Morphemes of English

Mayer (2007) concluded as she discussed the literacy abilities of deaf children, “it is not the presence of ASL but the absence of some form of face-to-face English that is at issue and the challenge for educators” (p. 416).

Gaustad, Kelly, Payne & Lylak (2002) suggested SEE as a way to improve the “insufficient morphographic skills of deaf students” (p. 17).

Background: Potential of SEE

Signing Exact English (SEE) (Gustason & Zawolkow, 1993)
- morphology of words is made visible
- signs to code audibly insalient English:
  - articles, pronouns, conjunctions and bound morphemes (Guo et al., 2013)
- 80 affixes
- Differentiate derivations:
  - “electric” (e.g., “electrical,” “electrician,” “electricity,” “electrify,” and “nonelectrical”)

Purpose and Research Questions:

To investigate the English-language abilities and reading achievement of a sample of students who were D/HH and attended a school where staff and students communicated simultaneously in grammatically accurate Standard English via speech and Signing Exact English (SEE).

- Do the participants:
  - demonstrate Standard English-language proficiency as measured by informal and formal tests?
  - demonstrate reading achievement within the average range of their hearing peers?
  - Are there significant correlations between speech and English-language and reading scores?
  - Do participants’ scores on English-language measures predict reading achievement as measured on a standardized assessment of reading achievement?

Participants

17 students who are D/HH (8 boys, 9 girls) all attend school for the D/HH (PreK-8), in metro area northwest US (population of the school: 45 students PreK(age 3)-grade 8)
- 7-8 years (2nd grade) to 13-9 years (8th grade)
- Diversity among the participants
  - Racially: 11 Caucasian, 3 Asian, 3 biracial
  - Socio-economic status: Varied
  - Other background variables: family structure, factors related to the parents (level of education and signing with their child, and school involvement).

Data Collected on Students

Hearing and assistive device use (i.e. Cls, hearing aids)
- Age of hearing loss, Unaided and aided hearing
- Assistive listening device use

Speech – Photo Articulation Test (PAT-3; Lippke, Dickey, Selmar, & Soder, 1997)
- 93 items, each describe a photo to prompt the use of a word with a target sound (initial, medial, or final position).
- Normed on 3-8 yr olds children with normal hearing so calculated a raw score (number of correctly pronounced phonemes out of the total possible articulation targets)

Language -Structured and unstructured language samples
- Structured Photographic Expressive Language – SPELT
- Unstructured – collected in everyday classroom activities
- Clinical Evaluation of Language Fundamentals (CELF)
- Researcher-created morphemic awareness task (MA)

Reading - Gates-MacGinitie Reading Test (GMRT) (MacGinitie, MacGinitie, & Mack, 2000)
Results:

Speech was NOT related to Language

<table>
<thead>
<tr>
<th>Grade 2-3 (n=8)</th>
<th>Grade 4-6 (n=13)</th>
<th>All Participants</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAT (speech articulation)</td>
<td>79% correct</td>
<td>76% correct</td>
</tr>
<tr>
<td>CELF 4 receptive</td>
<td>81.3</td>
<td>86.4</td>
</tr>
<tr>
<td>range: 73-77</td>
<td>range: 75-110</td>
<td>range: 83-110</td>
</tr>
<tr>
<td>CELF 4 expressive</td>
<td>84.3</td>
<td>87.9</td>
</tr>
<tr>
<td>range: 74-91</td>
<td>range: 70-118</td>
<td>range: 54-118</td>
</tr>
</tbody>
</table>

Note: Mean standard score for the CELF 4 is 100.

Discussion

- Receptive and expressive English language skills correlated to all reading achievement – not surprising (e.g. Catts, Hogan & Adlof, 2005; Moores & Sweet; 1990; Oakhill & Cain, 2012)
- As a group, reading achievement was commensurate with hearing peers in contrast to the common plateau finding (e.g. Mahoney et al., 2000; Spencer & Marschark, 2010)
- Of the 13 students, grade 4 and above, 85% read within 4th grade or higher

We conclude...

- Reading achievement of elementary and middle school D/HH students need not plateau and can be commensurate with that of hearing peers.
- D/HH students need access to the morphology of English in order to decode the many and varied multisyllabic words in particularly prevalent content area (math, science, social studies) reading materials in order to quickly process more-and-more advanced text.
- It is imperative that we in the profession examine the variables that may affect the achievement of D/HH students and advocate for changes in professional development and instructional practice.

Results:

Significant Correlations Between Language and Reading

<table>
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<tr>
<th>Language &amp; Reading</th>
<th>PAT (speech)</th>
<th>CELF 4 receptive</th>
<th>CELF 4 expressive</th>
<th>CELF 4 Core</th>
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<tr>
<td>PAT (speech)</td>
<td>-.316</td>
<td>-.584</td>
<td>-.612</td>
<td></td>
</tr>
<tr>
<td>CELF 4 receptive</td>
<td>.790**</td>
<td>.764**</td>
<td>.718**</td>
<td>.754**</td>
</tr>
<tr>
<td>CELF 4 expressive</td>
<td>.860**</td>
<td>.859**</td>
<td>.798**</td>
<td>.819**</td>
</tr>
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</table>

Two-tailed Pearson correlations: **significance at .01 level * significance at .05 level

Discussion

“The morphological component of conversational competence in English is dependent on the mode and completeness of the model of English to which deaf students are exposed” (Snedeker & Kello, 2008, p. 286).

- All staff at this school are explicit about the morphology of English through their use of SEE and they are given regular training and supervision to assess and maintain their skills, as Dr. Peg Mayer suggested.
- All staff expect students to use grammatically accurate, standard English. When they do not, the teachers and other staff use the “Again” strategy.

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## Background Characteristics of Students Reading within or Above Grade Level

### Table 1

<table>
<thead>
<tr>
<th>Name</th>
<th>Grade</th>
<th>Reading Level</th>
<th>Attendance Status</th>
<th>GPA</th>
<th>Parental Involvement</th>
<th>ACT</th>
<th>SAT</th>
<th>PSAT</th>
<th>AP</th>
<th>CLEP</th>
<th>AP Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>John</td>
<td>12</td>
<td>High</td>
<td>High</td>
<td>3.5</td>
<td>High</td>
<td>1150</td>
<td>1280</td>
<td>57</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Jane</td>
<td>11</td>
<td>High</td>
<td>High</td>
<td>3.2</td>
<td>High</td>
<td>1100</td>
<td>1200</td>
<td>52</td>
<td>2</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Bob</td>
<td>10</td>
<td>High</td>
<td>High</td>
<td>3.0</td>
<td>High</td>
<td>1050</td>
<td>1150</td>
<td>47</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Mary</td>
<td>9</td>
<td>High</td>
<td>High</td>
<td>3.1</td>
<td>High</td>
<td>1000</td>
<td>1100</td>
<td>43</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Data collected on: 

Stryker, Luetke, Nielsen; ACED HH 2015