VOWEL ERRORS: 
THE LOST WORLD OF SPEECH INTERVENTION

Tim Brackenbury, Ph.D., CCC-SLP
03-15-14

The Journey to Vowelerria

- An adventure across familiar territory
  - child speech intervention
- leading to uncommon terrain
  - vowel errors

Preparation: Education

- The guidebook of Evidence-Based Practice
  - the research evidence
  - past clinical experiences
  - client/family preferences
- What do we do when the evidence isn’t evident?
  - the research evidence is diffuse
  - past clinical experiences are minimum
  - client/family preferences are vague

Preparation: Education

- The native population
  - Typical development (Pollock, 2013; Stoel-Gammon & Pollock, 2008)
    - 0 – 6 months: vocants
    - 6 – 12 months: CV combinations
    - ~ 24 months: all vowels producible
    - ~ 36 months: all vowels accurate
    - corner vowels before others
    - stressed syllables before unstressed
    - monophthongs before diphthongs
    - non-rhotic before rhotic

Preparation: Education

- Deaf / Hard of Hearing
  - a common problem
  - age of loss
  - frequencies and severities
  - response to amplification
  - often clustered groups of vowels
Preparation: Education

- The native language
  - International Phonetic Alphabet
- Transcription reliability (Pollock & Berni, 2001)
  - Vowels < consonants
    - More overlap between vowels
    - More dialect variations

Preparation: Education

<table>
<thead>
<tr>
<th>Front</th>
<th>Mid</th>
<th>Back</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>i</td>
<td>u</td>
</tr>
<tr>
<td>Mid</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>eɪ</td>
<td>ə  ᵗ ʊ</td>
</tr>
<tr>
<td>Low</td>
<td></td>
<td></td>
</tr>
<tr>
<td>æ ə  a ɔ</td>
<td>e ɛ ə ʊ ɔ</td>
<td></td>
</tr>
</tbody>
</table>

Preparation: Education

- Tense
- Lax
- i
- u
- eɪ
- ə
- æ ə  a ɔ
- e ɛ ə ʊ ɔ

Preparation: Expectations

- What are your expectations about the research on vowel intervention?
- Think – Pair – Share
  - What aspects of speech have been addressed?
  - How were the studies done?

Vowelerria: Motor Shores

- Are interventions targeting motor skills successful?
  - No intervention studies found.

Vowelerria: Phonology Jungle

- Are interventions targeting linguistic knowledge successful?
  - Minimal Pairs (Stoel-Gammon & Pollock, 2008)
    - All showed improvements on target vowels
    - Inconsistent transfer to other vowels
  - Written representations of vowels (Reid, 2003)
    - The Vowel House
    - 8 – 17 11-year-olds
    - Observational report of improved vowel production
Vowelerria: Visual Beach

Are interventions targeting visual feedback successful?
- Electropalatography (EPG) and Ultrasound (Bernhardt, Stemberger, & Bascafalvi, 2010)
  - 2 case studies
  - Improvements reported in targeted vowels

Electropalatography (McLeod, 2009)

Ultrasound (Bernhardt, Gick, Bascafalvi, & Adler-Bock, 2005)

Are interventions targeting multiple aspects of phonology successful?
- Speake, Stackhouse, and Pascoe (2012)
  - Intervention addressing
    - Discrimination / Sorting
    - Rhyming
    - Articulatory drills
  - 2 10-year-olds
  - Both increased % vowels correct and word intelligibility

Vowelerria: Entire Ecosystem

Are interventions targeting specific populations successful?
- CAS
  - Motor learning therapy (Edeal & Gildersleeve-Newman, 2011)
    - Integral stimulation therapy with high and low intensities
    - Vowel errors reduced from ~55% to 35%
    - 2 preschoolers

Deaf / Hard of hearing
- No intervention studies found.

Vowelerria: Population River
Helping the children of Vowelerria

- Use the evidence that is available, as well as evidence for other speech intervention (Brackenbury, 2014; Gibbon, 2013)
  1. Collect and analyze detailed data (Pollock, 2002)
     - including helpful and harmful contexts
  2. Assess and treat vowel perception, identification, and discrimination
  3. Emphasize the linguistic importance of correct production

Helping the children of Vowelerria

- Emmet; 3-yr, 10-mo
  - Significant speech sound disorder
    - BBTOP standard scores all <65
  - Vowel errors
    - ~ 18% of the words
      - all vowels in his phonetic inventory
      - /ɛ, i/ [æ]
      - /a, i/ [aʊ]
      - /ɪ/ [a, ō, ɛ]
      - /ʊ/ [a, ō]

Helping the children of Vowelerria

- What should we do?
  - Collect more data on the erred vowels
  - Assess and address perceptual issues
  - Treat within meaningful units
    - minimal pairs
    - consider Multiple Opposition approach
  - Facilitate motoric abilities
    - may not be necessary based on his phonetic inventory
  - Include visual references for the different vowels targets

Helping the children of Vowelerria

- 4. Facilitate motoric aspects of production
  - 5. Include visual referents and feedback
  - 6. Keep detailed records on your vowel treatment and share with others

Helping the children of Vowelerria

- Emmet; 3-yr, 10-mo

Contact Information

Tim Brackenbury, Ph.D., CCC-SLP
246 Health and Human Services Building
Bowling Green State University
Bowling Green, OH 43403

tbracke@bgsu.edu
419.352.2515
### Key References

**Overall Review**

**Vowel Errors Across Populations**

### Key References

**Vowel Assessment**

**Visual Feedback Interventions**

### Key References

**Treatments Based on Other Speech Interventions**

### Additional References


### Images
- Lost World of Vowelerria
- Vowelerria National Anthem
  - http://www.youtube.com/watch?v=OKEUAzzn-lg