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Phonological Systems

Guest Editor: Linda R. Schreiber, M.S., CCC-SLP,
BCS-CL, ASHA Fellow
In partnership with University of Wisconsin – Eau Claire

Phonological Assessment and Intervention of Bilingual Children with Highly Unintelligible Speech

Raul F. Prezas, PhD, CCC-SLP

Moderated by:
Amy Natho, MS, CCC-SLP, CEU Administrator, SpeechPathology.com
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Phonological Assessment and Intervention of Bilingual Children with Highly Unintelligible Speech

Raul F. Prezas, PhD, CCC-SLP
Stephen F. Austin State University
prezasrf@sfasu.edu

Disclosure

- Financial
  - Received financial compensation from Speechpathology.com for this presentation
- Nonfinancial
  - Developed and tested unpublished assessment instrument and intervention model being presented
Learning Outcomes

- Identify at least 3 important assessment considerations for Spanish-speaking individuals.
- Identify at least 3 important dialectal considerations for Spanish-speaking individuals.
- Identify at least 3 considerations for bilingual phonological intervention for children with highly unintelligible speech.

English Language Learners

- English Language Learners (ELLs) have more than doubled in recent years and are increasing (Shin & Kominski, 2010)

- 75% of reported ELL students native Spanish-speaking bilingual children (Shatz & Wilkinson, 2010; Swanson, 2009)

- Often over or under identified for services (Goldstein, 2004)

- Practitioners more often use informal measures or assess in English only (Skahan, Watson, & Lof, 2007)
Languages of ELLs

- Spanish
- Vietnamese
- Hmong
- Cantonese
- Korean
- Other 455 Languages

http://www.uwec.edu/curriculum/curriculum.php

“We have to think different.”
Understanding ELLs and Phonological Assessment Practices

Speech and Language Concerns?
(Goldstein, 2004; Prezas, 2014)

- Case history and preliminary information
  - Family Concerns
  - Dialect(s)/Language use (e.g., home)
  - Proficiency and
  - Age
  - Program – (English immersion, dual-language)

- Assessment of skills in both languages
  - Support personnel, if needed (e.g., interpreters)
  - Scores low in one language or both?
Federal Mandates and Best Practices
(Arias & Friberg, 2017; ASHA, 2010; IDEA, 2006)

- Public agencies are required to have trained and knowledgeable professionals conduct evaluations
- Both native and second language (i.e., English) should be assessed
- Assessment in native language “unless it is clearly not feasible to so provide or administer” Does not apply to Intervention
- “Best practice” for bilingual assessment
  - Bilingually trained clinician
  - Trained Interpreter (interpreters speak, translators write)

Assessment practices
(Arias & Friberg, 2017)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Combination of formal and informal measures at least “sometimes”</td>
<td>98%</td>
<td>91%</td>
</tr>
<tr>
<td>Complete Assessments in the child’s native language and English</td>
<td>53%</td>
<td>77%</td>
</tr>
<tr>
<td>Use of Interpreters</td>
<td>70%</td>
<td>52%</td>
</tr>
<tr>
<td>Use of dynamic assessment at least sometimes</td>
<td>n/a</td>
<td>56%</td>
</tr>
<tr>
<td>Use or dynamic assessment rarely or never</td>
<td>n/a</td>
<td>43%</td>
</tr>
<tr>
<td>Positive perceptions of graduate program preparation</td>
<td>28%</td>
<td>38%</td>
</tr>
</tbody>
</table>
Consonants and Vowels

(Goldstein, 2001)

<table>
<thead>
<tr>
<th>Sound class</th>
<th>English</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stops</td>
<td>p b t d k g</td>
<td>p b t d k g</td>
</tr>
<tr>
<td>Nasals</td>
<td>m n p</td>
<td>m n p</td>
</tr>
<tr>
<td>Fricatives</td>
<td>f s x z s j</td>
<td>f s z s j</td>
</tr>
<tr>
<td>Glides</td>
<td>w j</td>
<td>w j</td>
</tr>
<tr>
<td>Affricates</td>
<td>g</td>
<td>dʒ</td>
</tr>
<tr>
<td>Liquid</td>
<td>l</td>
<td>l</td>
</tr>
<tr>
<td>Flap</td>
<td>r</td>
<td>r</td>
</tr>
<tr>
<td>Trill</td>
<td>ɾ</td>
<td>ɾ</td>
</tr>
<tr>
<td>Vowels</td>
<td>i e u o a</td>
<td>i e u o a</td>
</tr>
</tbody>
</table>

*The phonetic symbol /ɾ/ represents the Spanish trill in the IPA system. The American English prenasal "r" is represented by the IPA symbol /ɾ/*.

Dialectal Considerations

(Goldstein, 2004; Prezas, 2012)

- Most prevalent dialects in US – Mexican & Puerto Rican (consonant differences)
- Children from Mexican descent with adult-like speech vs. other dialects:
  - Sequences with /s/:
    - Escuela = /eskwelə/ vs. /eIkwelə/ or /e_kwelə/
    - Pescado = /peskaðo/ vs. /pekaðo/ or /pe_kə_o/  
  - Final Consonants (e.g., /s/):
    - Dos = /dɔs/ vs. /dɔh/ or /do_/  
    - Guantes = /wantaʃe/ vs. /wanet}/
  - Liquids (i.e., /l/ and /ɾ/):
    - Verde = /beɾe/ /vs. /beɾe/
Typically Developing Children

(e.g., Fabiano, 2006; Fabiano-Smith & Goldstein, 2010; Gildersleeve-Neumann, Kester, Davis, & Peña, 2008; Prezas, Hodson, Schommer-Aikins, 2014)

- **Monolingual** Spanish-speakers:
  - consonant sequence/cluster reduction
  - stridency deletion (dialect dependent)
  - deviations of liquids (i.e., flap /ɾ/ and trill /r/)

- Additionally in **Bilinguals** (Spanish-English):
  - Similar phonological PATTERNS in both languages
  - Speech sound development of bilingual children:
    - Less than 4-years-old
      - Dissimilar and more errors initially than monolingual peers
    - Still within normal range
    - Greater than 4-years-old
      - more similar to monolingual peers

Children with SSD

(Dodd, Holm, & Wei, 1997; Holm & Dodd, 1999; Goldstein, 2000; Prezas, 2012)

- Monolingual Spanish speakers:
  - Low intelligibility to individuals outside of immediate family

- Additionally in Bilinguals:
  - Low intelligibility in BOTH languages

- “Red Flags”:
  - Initial consonant deletion
  - Fronting/backing
  - Cluster/sequence reduction
  - liquids/stridency (e.g., /ɾ/)
  - Monosyllables
Common productions of Spanish-speaking children who are highly unintelligible (Prezas, 2015)*

<table>
<thead>
<tr>
<th>Word</th>
<th>English</th>
<th>Target</th>
<th>Production</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chicle</td>
<td>(gum)</td>
<td>/ʧikle/</td>
<td>[tite]</td>
</tr>
<tr>
<td>Cuchara</td>
<td>(spoon)</td>
<td>/kuʧara/</td>
<td>[taja]</td>
</tr>
<tr>
<td>Escuela</td>
<td>(school)</td>
<td>/eskwela/</td>
<td>[weja]</td>
</tr>
<tr>
<td>Estrella</td>
<td>(star)</td>
<td>/estreja/</td>
<td>[teja]</td>
</tr>
<tr>
<td>Lápiz</td>
<td>(pencil)</td>
<td>/lapis/</td>
<td>[api]</td>
</tr>
<tr>
<td>Pescado</td>
<td>(fish)</td>
<td>/peskaðo/</td>
<td>[aho]</td>
</tr>
<tr>
<td>Sombrero</td>
<td>(hat)</td>
<td>/sombrero/</td>
<td>[bejo]</td>
</tr>
<tr>
<td>Negro</td>
<td>(black)</td>
<td>/negro/</td>
<td>[nego]</td>
</tr>
</tbody>
</table>

- Words versus continuous speech sample
- No "consistent" omissions (disordered) by age 4 (generalization – OK)
- Difficulty with trilled/flapped "r" only = case by case (age/motivation)

*Note: Example productions from children with Mexican dialect

Severity Continuum

(OMISSIONS/SUBSTITUTIONS/DISORTIONS; Hodson 2010)

**Profound**
- EXTENSIVE Omissions
- Many Substitutions

**Severe**
- Many Omissions
- EXTENSIVE Substitutions

**Moderate**
- Some Omissions
- Some Substitutions

**Mild**
- Omissions Rare
- Few Substitutions
Speech Sound Evaluation
(Prezas & Hodson, 2007)

- Evaluation of Hearing
- Oral mechanism screening
- Child's phonological strengths and weaknesses
  - Severity level (i.e., mild, moderate, severe, profound)
  - Percentage of intelligible/understandable words
  - Stimulability information
- Language assessment (expressive and receptive)
- Metaphonological assessment
- Direction for intervention

Narrative Speech Sample
(Rojas & Iglesias, 2009)

- Short speech sample
- PCC
- Percent Intelligible words
- MLR
- Percentage of improvement
  - Progress Reports
  - Benchmarks
Disorder or Difference?

- Audio Examples
- 5-year-olds
- Predominantly Spanish

Stimulability

(Hodson, 2010; Miccio, Elbert, & Forrest, 1999; Prezas, 2015; Rvachew, 2005)

- Child's ability to correctly imitate a given phoneme with instruction/cues
- Results provide clear prognostic indications
- Accuracy for unmastered phoneme more likely to occur over given time when child is stimulable, rather than unstimulable.
- Help with treatment planning and target selection
Bilingual Intervention*
(Fabiano, 2012; Goldstein & Fabiano, 2007; Kohnert et al., 2005; Kohnert & Derr, 2004)

- **Bilingual Approach**
  - Treat constructs common to both languages
  - Common Phonological deviations (Spanish and English)

- **Cross-Linguistic Approach**
  - Focus on skills unique to each language
  - Language-specific errors/sounds
  - Language of Treatment based on history, use, proficiency and environment.
  - Intervention in one language may generalize to the other language (Paradis, 2001)

*Emphasis on children with highly unintelligible speech
Treatment Approaches
(Fey, 1992; Hodson, 2010)

- **Phoneme-Oriented “Vertical” Approach**
  - One goal taught until criterion is reached
  - Children with few speech sound errors

- **“Horizontal” Approach**
  - More than one goal addressed in each session
  - Targeting one goal in Language 1 and another in language 2 during the same session

- **Pattern-Oriented “Cyclical” Approach**
  - Goals addressed in cyclical fashion
  - Goals recycled in subsequent cycles
  - Languages also rotated based on client needs

Stimulable vs. Non-Stimulable Sounds

- Studies have found that outcomes are generally better when stimulable targets were treated (Rvachew, 2005).

- Outcomes for unstimulable targets show improvement with combination of:
  - Phonemic perception training
  - Phonetic placement procedures

- **Recommendation:** a balance of complexity within a child’s Zone of Proximal Development, beginning with stimulable sounds and targeting appropriate complexity as well.
Intervention and Bilinguals
(Prezas, 2012)

- **Pattern Oriented Approach**
  - Target consistent, stimulable deviations
  - Stimulate non-stimulable sounds
- Therapy in **Spanish First** preferred (if possible)
  - Children who primarily speak Spanish in the home
  - Prior to Pre-K (limited English exposure)
  - Typically “Walk-in” students (prior to Pre-K program)
- Therapy in **both languages**
  - Once second language established (e.g., English)
  - Consider English input/environment (learning English in school setting)

Potential Optimal “Primary” Spanish Target Patterns
– Word Structures and Anterior/Posterior Contrasts

- **Word Structures (Omitted Segments)**
  > “Syllableness” – if needed
    - 2-syllable word combinations
    - Vowel sequences (e.g., [a-a] - /kasa/, /mapa/; [o-o] - /oso/, /foko/)
    - 3-syllable/word combinations (e.g., /kamisa/)
  > Singleton consonants
    - **CV** – word-initial /p,b,m,w/ if lacking/omitted
    - **VC** – final /n/ if lacking (to facilitate final sounds)
- **Anterior/posterior contrasts (when stimulable)**
  > Velars (fronting) – word initial /k/ and /g/
  > Alveolars (backing) – word initial /t/ and /d/
Potential Optimal “Primary” Spanish Target Patterns - /s/ Sequences and English /s/ Clusters

- **/s/ sequences with omissions** (not substitutions or distortions)
  - Word-initial (i.e., /esp/, /est/, /esk/)*
    - Short, two syllable when possible
    - (e.g., ésto; ésta; esqui)
  - *Do not target if substitution/omission of /s/ is acceptable in child’s Spanish dialect
    - Substitute /s/ clusters in English for bilingual speakers of other dialects of Spanish
    - Also may substitute weak syllable deletion here using sequences listed (e.g., espero; escoba)
  - Incorporate phrase: “Es un/una” _ - (/s/ sequence word) after child demonstrates facility producing /s/ sequence in production-practice words.

Potential Optimal “Primary” Spanish Target Patterns - Liquids

- **Facilitate liquids /l/ and tapped /ɾ/ (even if not stimulable)**
  - Word-initial /l/ [preceded by week of tongue-tip clicking]
  - Flap (tapped) /ɾ/
    - (dependent on dialect)
    - [e.g., Puerto Rican dialect - /ɾ/ substituted for /l/ in coda position]
  - /l/ clusters and tapped /ɾ/ clusters
    - Do not blend initially
    - Only for children who already produce singletons
    - Word-initial /pl, bl, kl, pr, tr, kr/ if lacking
Potential Secondary Target Patterns

- Singleton consonants
  - Palatals /j, ʝ/; Trilled /r/
  - Other singleton stridents /t, s/

- All Other Consonant Clusters/Sequences
  - Word-initial CC (e.g., /fl/, /fr/)
  - Word-medial CC (e.g., /buʃko/, /caľdo/); CCC (e.g., /koɲtra/)

- Other considerations
  - Voicing Contrasts (prevocalic only) and Phonemic Vowel Deviations
  - Assimilations and other idiosyncratic deviations (if needed)

Treatment Session – Basic Structure

- Review last session’s practice words
- Listening activity [approximately 30 seconds]
  - Words containing target [15-20 NOT carefully selected] (child must NOT repeat these words)
  - Slight amplification
  - Have child say a couple potential practice words using amplifier

- Production practice words [5-6 carefully selected]
- Activities for eliciting productions
  - use cues/assists/models as needed [Goal is as close to 100%]
  - child “takes turn” after saying “target” correctly in production-practice word [change activities every 7 or 8 minutes]

- Metaphonological Activity [e.g., rhyming]
- Probe for next session’s target
- Repeat listening activity [with slight amplification]
- Home practice [2 minutes per day]
Don’t forget…

- Keep the child’s **level of bilingualism** in mind at all times.
- Incorporate **phonological awareness** activities in assessment.
- **Send home** information with child for families.
- **Monolingual SLPs** should be familiar with “best practice” for **bilingual assessment**!

**Therapy Reminders**

- **Use** slight amplification (e.g., amplifier)
- Goal is “**consistent**” accuracy each time
  - Choose target words carefully
    - Elicit a **correct** response (Remember – as close to 100%)
    - Real words that are short in length
    - Find child’s “level” for target (hierarchy)
    - Use cues/assists/models as needed to reach goal
- **Avoid** selecting words containing consonant at same place of articulation as error:
  - English: Dog (/d/ for /g/)
  - Spanish: Gato (/g/ for /t/)
Targeting /r/

- Help! Student (child) substitutes American “r” for Spanish tapped/trilled “r”!
- Help! Student (child) substitutes tapped “r” for American ”r”!
- Question: Is it a cross-linguistic difference or are all liquids problematic?
- Question: Does the child produce a version of the “r” correctly?

Persistent Speech Sound Errors
(Preston, McCabe, Rivera-Campos, Whittle, Landry & Mass, 2014)

- Highly unintelligible children
  - May receive Tx for years
  - Likely become Persistent SSD Cases
- Generalization of liquids
- Motor-based treatment
- Ultrasound visual feedback treatment
- Spanish liquids and visual biofeedback (Ahmed Rivera-Campos)
Tips for Monolingual SLPs

- Find a bilingual (trained) SLP to consult with
- Find an interpreter (for treatment as well!)
  - Other speech students who are bilingual (groupings)
  - General ed students (job posting – resume)
  - People in the community
- Adapt Materials
  - Use “ESL strategies” in reverse: label everything in your room in Spanish for you
  - Ask colleagues for things they have that have been translated
  - Use online free translation (with extreme caution) to translate single words

Parent Involvement
(Prezas, 2015)

- Keep all parents informed.
  - “What would I want shared with me as a parent?”
  - “How can I make sure I do that for my parents who speak other languages?”
- Find ways to communicate with speakers of other languages
- Encourage family to continue speaking to child in native (dominant) language – even children with impairment!
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