ASSESSMENT OF PHONOLOGICAL SKILLS IN SPANISH-SPEAKING CHILDREN

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Spanish Population in the U.S.

- As of 1998, The United States had the 5th largest Hispanic population, with about 30 million people (American Demographics)

- 86% of this population listed Spanish as their primary language (U.S. Census Bureau, 2000)
United States School Statistics

• Number of ELL students in schools has more than doubled from 1990-2005 (NCELA)
• Many states have experienced enrollment growth of 200% or more ELL students in the past 10 years (NCELA)
• 80% of reported ELL students speak Spanish
• 29 million speak Spanish in the home (USCB)
Spanish-Speaking Children

• More often acquire English in a school setting (USCB, 2008)

• Go through a transition period where they become more proficient in English (e.g., Kohnert & Bates, 2002)

• Typically are immersed in English-speaking classrooms (USCB 2008)
National Survey on Phonological Assessment Practices
(Skahan, Watson, & Lof, 2007)

- SLPs surveyed predominantly used:
  - Case history
  - Estimates of intelligibility
  - Single word test

- Only 36% assessed ELL students for speech-sound disorders.

- Of the respondents who do assess ELL students, most rely on informal procedures or English-only tests.
Assessment of Spanish-Speakers

• Consider productions in both languages

• Use standardized tests with normative data on Spanish-speaking children

• Incorporate the assistance of bilingual staff, if needed:
  – Interpreters
  – Para-professionals
  – Staff
Spanish and English Similarities

• Both languages use the Roman Alphabet.

• 30-40% of all words in Spanish have a related word in English – Cognates (i.e., central)

• Sentences in both languages have the same basic structures (Except for a couple of word order exceptions such as adjective before noun in English and noun before adjective in Spanish).
Spanish and English Differences

- Consonants
- Vowels
- Allophones
- Dialect
- Word Structure
- Accents
Consonants in Spanish

There are 18 phonemes in general Spanish (Nuñez-Cedeño and Morales-Front, 1999)

- Stops: /p, t, k, b, d, g/
- Fricatives: /f, s, x/ (x = velar fricative, i.e., espejo)
- Affricate: /tʃ/
- Glides: /w, j/
- Lateral: /l/
- Flap /r/ and Trilled /ɾ/
- Nasals /m, n, ŋ/ (ŋ = voiced palatal nasal, i.e., niño)
Vowels in Spanish

There are five vowels in Spanish. All vowels are monophthongs. (Goldstein, 2001)

- /i/
- /e/ - sometimes /ɛ/
- /u/
- /o/
- /a/
## Spanish vs. English

Source: (Goldstein, 2001)

<table>
<thead>
<tr>
<th>Sound class</th>
<th>Spanish</th>
<th>English</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 n</td>
<td>m n n</td>
</tr>
<tr>
<td>Fricatives</td>
<td>f s x</td>
<td>f v s z ð j ʒ</td>
</tr>
<tr>
<td>Glides</td>
<td>w j</td>
<td>w j</td>
</tr>
<tr>
<td>Affricate</td>
<td>ɬʃ</td>
<td>ɬʃ ɗʒ</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>r̊</td>
<td>r̊</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 /r/ represents the Spanish trill in the IPA system. The American English prepalatal “r” is represented by the IPA symbol /ɬ/. 
Allophones of Spanish

There are four prevalent allophones worth mentioning:

The Spirants (most generally occur intervocalically)
• /b/ = /β/ voiced bilabial fricative as in /aβlar/ (hablar)
• /d/ = /ð/ voiced interdental as in /deðo/ (dedo)
• /g/ = /ɹ/ voiced velar as in /laɣo/ (lago)

The voiceless bilabial fricative
• /ɸ/ as in /emɸermo/ (enfermo)
Dialectal differences are widespread and account for many differences (like differences in American vs. British - vowels)

In the U.S., the two most prevalent dialects of Spanish are Mexican and Puerto Rican (Iglesias & Goldstein, 1998)

- Southwestern U.S. – Mexican Spanish
- Caribbean (North and South East) – Puerto Rican/Cuban

*Unlike differences in English dialects (vowels), differences in Spanish dialects primarily affect consonants, specifically fricatives and liquids.
Dialectal Variations

The following are the most common dialectal variations (Goldstein, 2004)

- Deletion and/or aspiration of /s/
  /dos/ becomes /do/ or /doh/

- Deletion of medial /ɾ/
  /kortar/ becomes /kottar/ or /korta/

- Substitution of /l/ or /i/ for /ɾ/
  /kortar/ becomes /koltar/ or /koitar/

- Substitution of /x/ or /R/ for /ɾ/
  /pero/ becomes /pexo/ or /peRo/ (R is Puerto Rican)
Other Dialectal Variations

• Substitution of /s/ and deletion of /d/
  /peskaðo/ becomes /pehka.o/

• Variations of /j/
  /roðija/ becomes /roðiʒa/ or /roðiʒa/
  /jojo/ becomes /dʒoʤo/

• Deletion of final /r/
  /mirar/ becomes /mira/
Spanish word structures

• Initial /s/ consonant sequences = /es_/  
  Ex: estampa, espejo, escuela

• Fewer final consonants (lack of endings; mostly _a)  
  – _s / _n / _d / _r / _j / _l / _z  
  – None of the following: _ps, _ts, _ly  
  – Pronunciation of final /d/ different

• More multisyllabic words than English

• Some English sounds not common in Spanish
  /ow/, /awl/, /sts/, /U/
Spanish Accents

Written accent important to phonetic function

• To break a diphthong
  Ex: día

• To distinguish homonyms
  el (the-article) / él (he – pronoun)

• To distinguish pronunciation
  – ésta vs. está
  – baile vs. bailé
English and Spanish Sound Comparisons

• Majority of phonemes in both languages reported to be acquired by age 4 (e.g., Jiménez, 1987; Mann & Hodson, 1994)

• Spanish phonemes reported to be mastered last are flapped r, trilled r, /s/, /l/, and /tʃ/ (Acevedo, 1989; Jiménez, 1987; Linarez, 1981; Terrero, 1979)

• Some argue that certain sounds (i.e., /x/, /s/, /tʃ/, /l/, /r/, /r/) and consonant clusters in Spanish are not mastered until age 7 (e.g., Acevedo, 1993; De la Fuente, 1985; Mason et. al., 1976)

• Similar to English norms reported by Sander (1972)
Phonological Patterns of Typically Developing Spanish-Speaking Children

Commonly occurring patterns among typically developing children are:

– consonant sequence/cluster reduction
– stridency deletion
– deviations of liquids (i.e., tap /ɾ/ and trill /r/

(e.g., Becker, 1982; Diamond, 1983; Goldstein 1996; Mann, Kayser, Watson, & Hodson, 1992)
Phonological Patterns of Unintelligible Spanish-Speaking Children

- Similar patterns as typically developing children (e.g., consonant sequence/cluster reduction)

- Additional errors:
  - Initial consonant deletion (e.g., /sopa/ pronounced [opa])
  - Weak syllable deletion (e.g., /elefante/ pronounced [fante])
  - Velar fronting (e.g., /boka/ pronounced [bota])
Phonological Patterns of Bilingual (Spanish-English) Children

• Similar phonological patterns in both languages
• Common Patterns:
  – Deviations of liquids (i.e., tap /r/ and trill /r/)
  – Postvocalic singleton omissions
  – Stridency deletion
• Phonological skills similar regardless of level of bilingualism (e.g., predominantly Spanish- or English-speaking)

(e.g., Gildersleeve, Neuman, & Davis, 1998; Goldstein, Fabiano, & Washington, 2005; Goldstein & Washington, 2001; González, 1984)
Analysis of Phonological Deviations (Hodson, 2007)

- Identify Deficient Phonological PATTERNS
  - Syllable/word Structure Omissions (e.g., Final C)
  - Consonant Category Deficiencies (e.g., Velars)
  - Substitutions & other Strategies (e.g., Assimilations)

- Determine SEVERITY of Child’s Phonological Impairment (Mild, Moderate, Severe, Profound)

- Identify OPTIMAL TARGET PATTERNS to Expedite Intelligibility Gains

- Obtain BASELINE DATA to be used for Comparison Following Treatment for Evidence-Based Practice
Examples of Assessments used for Phonological Analysis

• In English
  – Goldman-Fristoe Test of Articulation (Goldman & Fristoe, 2000)

• In Spanish
  – Spanish Articulation Measures (Mattes, 1987)
  – Contextual Probes of Articulation Competence Spanish (CPAC-S, Goldstein & Iglesias, 2006)
  – Spanish Assessment of Phonological Patterns (Hodson, 2008)
Potential Optimal Primary Target Patterns for Treatment

- **Word Structures** (when phonemes are omitted)
  - “Syllableness” (for omitted vowels, dipthongs, etc.)
    - 2-syllable compound words
    - 3-syllable compound words
  - **Singleton Consonants** (when consistently omitted)
    - CV (word-initial /p/, /b/, /m/, /w/)
    - VC (Voiceless final stops /p, t, k/; possibly final /m,n/)
    - VCV (e.g., *apple*, if child omits all medial consonants)

- **/s/ Clusters/Sequences**
  - Word-initial (e.g., /sp/, /st/; espejo, estampa)
  - Word-final (e.g., /ts/, /ps/) in English
Potential Optimal Target Patterns - Continued

• Anterior-Posterior Contrasts
  – Velars (if Fronter)—when Stimulable
    • Word-final /k/ first (English); word-initial /k/ or /g/
    • Occasionally /h/ (English-only)
  – Alveolars (if Backer)

• Liquids (Facilitate even if not Stimulable)
  – Prevocalic /l/
  – Prevocalic /r/ (also /kr, gr/ if child has Velars)
Listening Examples
General Comments Regarding Targets

- Approximately 60 min per PHONEME target
- At least 2 phonemes per target PATTERN
- Reassess phonology between cycles
- Recycle Primary Patterns as needed until begin to emerge in conversation
- Proceed to Secondary Patterns after
  - Early developing patterns established
  - /s/ Clusters/sequences emerging in conversation
  - Velars and Alveolars used contrastively
  - Practice words for Liquids produced without Glides
Underlying Concepts for Cycles
Phonological Remediation Approach

- Phonological acquisition is gradual
- Children acquire sound system primarily by listening
- Associate kinesthetic & auditory sensations for later self-monitoring
- Phonetic environment can facilitate (or inhibit) correct sound production
- Children actively involved in phonological acquisition
- Children tend to generalize
- An optimal “match” facilitates a child’s learning
Major Recommendations

• Identify Consistent Broad Deviations
• Determine Priorities [clients, time, individual/group]
• Select Optimal Targets [patterns, phonemes, words]
• Increase Complexity Gradually
• Facilitate Development of Awareness
  [auditory, kinesthetic, semantic]
• Incorporate
  • Slight Amplification
  • Tactile Cues [as needed]
  • Models [particularly for new target]
• Enhance Metaphonological Awareness & Early Literacy Skills
A need for more information

• Spanish-speaking children are often over or under identified for special education instructional services

• More data are needed on typically developing bilingual (Spanish-English) children

• Case studies and treatment studies are needed
Questions?
Selected References


• Iglesias, A. (1978). *Assessment of phonological disabilities*. Unpublished assessment tool, Ohio State University, Columbus, OH.


