

ASSESSMENT OF PHONOLOGICAL SKILLS IN SPANISH-SPEAKING CHILDREN

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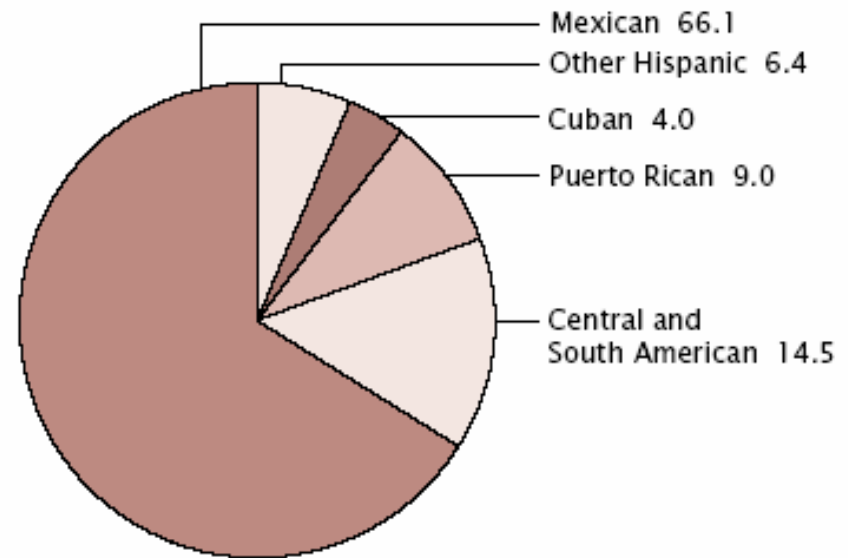
Spanish Population in the U.S.

- 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)

Figure 1.

Hispanics by Origin: 2000

(In percent)



Source: U.S. Census Bureau, Current Population Survey, March 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

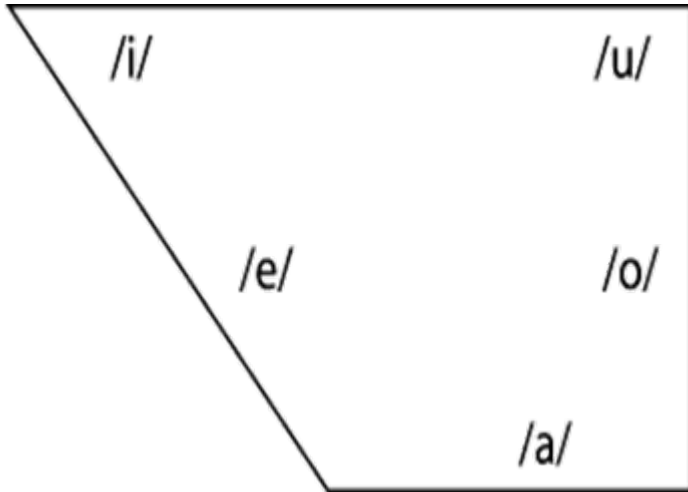
- Consonants
- Vowels
- Allophones
- Dialect
- Word Structure
- Accents

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: //
- Flap /r/ and Trilled /r/
- Nasals /m, n, ɲ/ (ɲ = 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)

Sound class	Spanish						English													
Stops	p	b	t	d	k	g	p	b	t	d	k	g								
Nasals	m	n	ɲ				m	n	ŋ											
Fricatives	f	s	x				f	v	s	z	θ	ð	ʃ	ʒ						
Glides	w	j					w	j												
Affricate	tʃ						tʃ	dʒ												
Liquid	l						l	ɹ												
Flap	ɾ																			
Trill	r ^a																			
Vowels	i	e	u	o	a		i	e		u	o	ɑ	ɑʊ	ɑɪ	ɔɪ					
							ɪ	ɛ	æ	ʊ	ɔ	ə	ʌ	ɚ	ɝ					

^aThe phonetic symbol /r/ represents the Spanish trill in the IPA system. The American English prevocalic “r” is represented by the IPA symbol /ɹ/.

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/ = /ɣ/ voiced velar as in /laɣo/ (lago)

The voiceless bilabial fricative

- /ɸ/ as in /emɸermo/ (enfermo)

Dialects of Spanish

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 /r/
/kortar/ becomes /kottar/ or /korta/
- Substitution of // or /i/ for /r/
/kortar/ becomes /koltar/ or /koitar/
- Substitution of /x/ or /R/ for /r/
/pero/ becomes /pexo/ or /peRo/ (R is Puerto Rican)

Other Dialectal Variations

- Substitution of /s/ and deletion of /d/
/peskađo/ becomes /pehka.o/
- Variations of /j/
/rođija/ becomes /rođija/ or /rođiza/
/jojo/ becomes /dʒodʒo/
- 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/, /aw/, /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/, //, and /tʃ/ (Acevedo, 1989; Jiménez, 1987; Linarez, 1981; Terrero, 1979)
- Some argue that certain sounds (i.e., /x/, /s/, /tʃ/, //, /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 /r/ 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)
 - *Khan-Lewis Phonological Analysis – Second Edition* (Khan & Lewis, 2002)
 - *Hodson Assessment of Phonological Patterns – Third Edition* (Hodson, 2004)
- 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, diphthongs, 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 //
 - 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?

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