Spanish phonological awareness: Dimensionality and sequence of development during the preschool and kindergarten years.

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Background

- Spanish PA predicts Spanish literacy (Branum-Martin et al.; Carrillo; Signorini et al…)

- Spanish PA predicts English literacy (Durgunoglu et al.; Gottardo et al.; Manis et al…)

Learning from science.
Background

- Lots of PA skills (Rhyming, blending, segmenting, etc.)
- Do PA skills that emerge at different points in development reflect the same latent ability (heterotypic continuity)?
Background

Many argue, ‘Yes!’

- Greek: Papadopoulou et al.
- English: Anthony et al.; Lonigan et al.; Schatschneider et al.; Stahl & Murray; Stanovich et al.; Wagner et al…
- Dutch: Vloedgraven & Verhoeven
Background

Plenty argue, ‘No!’

- Norwegian: Hoien et al.
- English: Yopp; Muter et al.
- Spanish: Carrillo
Importance of Dimensionality and Sequence of Development

- Early Identification
- Prevention of RD
- Guide scope and sequence of instruction
- Guide test development
Research Questions

1. What is the factor structure of Spanish PA?
2. Is there a sequence to Spanish PA development?
Participants

- 1,265 Spanish dominant ELLs
- 3- to 6-year-olds
- Reside in TX or FL
- Low and middle SES
- 99% Hispanic/Latino
- 53% female
Methods

- Single shot case study design
- Children tested with 4 PA tests
- PA Item content created 3 x 4 factorial
Measures

1. Blending Multiple Choice
2. Blending
3. Elision Multiple Choice
4. Elision
Receptive PA tests

- Blending Multiple Choice
- Elision Multiple Choice
Expressive PA tests

Blending
- saca + puntas = sacapuntas
- cal + zón = calzón
- /s/ + /o/ + /l/ = sol

Elision
- mediodía - medio = dia
- repollo - re = pollo
- abrazo - /a/ = brazo
Phonological Awareness Measures

1. Blending multiple choice & Blending free response PCTOPP
   - words into compounds
   - syllables into words
   - phonemes into words

2. Elision multiple choice & elision free response PCTOPP
   - words from a compound
   - syllables from a word
   - Single phoneme from a word
# Factorial Design among Test Items

<table>
<thead>
<tr>
<th>Word Structure</th>
<th>Task</th>
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<tbody>
<tr>
<td></td>
<td>Blending Multiple Choice</td>
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## Factorial Design among Test Items

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Research Question #1

What is the factor structure of Spanish PA?
1 Factor Model of Spanish PA

CFI= .80, TLI=.79, RMSEA=.07
3 Factor Model of Spanish PA

CFI = .81, TLI = .80, RMSEA = .07
4 Factor Model of Spanish PA

Blend MC

Blend

Elision MC

Elision

CFI=.96, TLI=.96, RMSEA=.03
Hierarchical Model of Spanish PA

CFI = .96, TLI = .96, RMSEA = .03
Research Question #2

Is there a sequence to Spanish PA development?
Hierarchical Model of Spanish PA

CFI= .97, TLI=.97, RMSEA=.03
Sequence of Spanish PA Development along Dimension of Task Complexity

Discriminative Information

Latent PA ability / Theta

Blend MC
Sequence of Spanish PA Development along Dimension of Task Complexity

Discriminative Information vs. Latent PA ability / Theta

- Blend MC
- Blend
Sequence of Spanish PA Development along Dimension of Task Complexity

![Graph showing sequence of Spanish PA Development along Dimension of Task Complexity]
Sequence of Spanish PA Development along Dimension of Task Complexity

Latent PA ability / Theta

Discriminative Information

Blend MC
Elision MC
Blend
Elision

Latent PA ability / Theta

-7 -5 -3 -1 1 3 5 7
Sequence of Spanish PA Development along Dimension of Task Complexity

Latent PA ability / Theta

Discriminative Information

-7 -5 -3 -1 1 3 5 7

Blend MC
Elision MC
Blend
Elision

Latent PA ability / Theta
Sequence of Spanish PA Development along Dimension of Task Complexity

Latent PA ability / Theta

Discriminative Information

Blend MC
Elision MC
Blend
Elision

Latent PA ability / Theta
Sequence of Spanish PA Development along Dimension of Word Structure

- Discriminative Information
- Latent PA ability / Theta
- Words
- Syllables
- Phonemes
Conclusions

Hierarchical model implies *both* a single unifying PA ability and distinct method factors.
Conclusions

There is a reliable order in the emergence of PA skills at least along dimension of task.
blending ➔ elision
recognition ➔ manipulation
Conclusions

- No clear order of acquisition of PA skills along dimension of word structure.

- However, many determinants of linguistic complexity were not controlled (word length, syllable structure, stress pattern, phonotactic probability, articulatory gestures)
Next Steps….

- Develop new Eng. & Spn. PA tests as part of SRCBM School Readiness Curriculum Based Measurement system (SRCBM)
- Progress monitoring system for PreK and early elementary.
- Will measure letter knowledge, PA, and Vocab in English and Spanish
Lessons learned and followed

- SRCBM will not include any elision MC tests
- Spanish PA tests will not include compound words
- ICCs show 10% to 15% variance in blending scores due to examiner.
- So, SRCBM will include computerized administration of blending and blending multiple choice tests.
Lessons learned and followed

- Effect of shared versus unique phonemes in different positions for ELLs taking English PA tests.
- Effect of shared versus unique clusters in different positions for ELLs taking English PA tests.
Learning from science.
Sequence of Spanish PA Development along Dimension of Word Structure

Discriminative Information

Latent PA ability / Theta

Words
Sequence of Spanish PA Development along Dimension of Task Complexity

Latent PA ability / Theta

Discriminative Information

Blend MC
Blend
Elision

Latent PA ability / Theta

0
0.05
0.1
0.15
0.2
0.25
-7 -5 -3 -1 1 3 5 7
Sequence of Spanish PA Development along Dimension of Task Complexity

Latent PA ability / Theta

Discriminative Information

- Blend MC
- Blend
- Elision

Latent PA ability / Theta
Sequence of Spanish PA Development along Dimension of Task Complexity

![Graph showing the sequence of Spanish PA Development along the Dimension of Task Complexity. The graph plots Discriminative Information against Latent PA ability/Theta, with three curves representing Blend MC, Blend, and Elision.]