

# Cross-Linguistic Relations Among Bilingual and Biliterate Learners: Interdisciplinary Perspectives and Convergences



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# Cross-linguistics as a theoretical phenomenon



- Bilingualism as inherently additive (Grosjean, 2012; Snow, 1992)
- Cummins' L1 – L2 *linguistic interdependence*
  - Common underlying proficiency
  - Thresholds of both L1 and L2
- *Script Dependence* (Bialystok, Luk, & Kwan, 2005; Geva & Siegel, 2000)
- *Structural Sensitivity Theory* (Kuo & Anderson, 2010)
- *Interdependence Continuum* (Proctor, August, Snow, & Barr, 2010)
- *Task-Dependent Bidirectional Transfer Hypothesis* (Prevoo, Malda, Mesman, and van Ijzendoorn, 2015)

# Cross-linguistics as an empirical challenge



- The bilingual as two monolinguals (Grosjean)
  - Assessment paradigms bifurcate (Proctor & Silverman, 2011)
- Notion of “transfer” is problematic
  - Causal implication for primarily correlational work
  - Problems for instructional implications
- Degrees of literacy across languages is problematic
  - Instructional program models
- The role of SES
  - Cross-national comparisons are difficult

# Agenda for today



- A “state-of-the-art” literature review (Genesee et al., 2006; Proctor & Zhang-Wu, forthcoming)
  - Insights from the process
  - Some initial findings
- Personal empirical frustrations
  - Quantitative derivations
  - Some emerging qualitative findings
- Conclusions and recommendations

# Review of cross-linguistic literature



## ● Process

1. Search of multiple aggregated databases: studies in the 21<sup>st</sup> century
  1. “bilingual\*” = 33,580 hits
  2. Multiple language pairings (with English): Chichewa, Chinese, Farsi, French, Greek, Italian, Korean, Malay, Nahuatl, Oriya, Russian, Spanish, Tamil, Urdu, and Zulu
  3. Narrowed to Chinese, French, Korean, & Spanish
2. Additional literacy-based search terms
  1. Vocabulary, reading, word reading, phonology, language, literacy
3. Matched with “cross-linguistic” or “transfer”
4. Final sample of 41 studies

# Some broad findings

## Primarily quantitative studies

- Traditions of applied linguistics, second language acquisition, psychology, educational psychology converge here
  - ✦ Some of these disciplines have limited application to applied learning contexts, i.e.:
    - Constructs
    - Measures
    - Methods

## Limited qualitative studies

- Gort (2006) on emergent bilingual writing

- Quant studies rely on large human samples and limited language corpus
  - Language pairings are relatively broad
- Qual studies rely on limited human samples and large language corpus
  - Language pairings (currently) are relatively constrained
- Advantages and disadvantages of both

# Some specific findings



- Phonological/phonemic awareness & word reading
  - Robust findings across all 4 language pairs
- Morphological awareness
  - Relatively well-developed, positive relations in studies across different language pairs (Hu, 2013; Pasquarella et al., 2011; Ramirez, Chen, & Pasquarella, 2013; Wang, Cheng, & Chen, 2006; Wang, Ko, & Choi, 2009)
- Vocabulary knowledge
  - Evidence that Spanish vocabulary predicts
    - ✦ English cognate vocabulary (Ramirez, Chen, & Pasquarella, 2013)
    - ✦ Reading comprehension (Nakamoto, Lindsey, & Manis, 2008; Proctor, August, Carlo, & Snow, 2006)
    - ✦ Word reading (Zhao, Dixon, Quiroz, & Chen, 2015)
    - ✦ Phonemic (Atwill et al., 2007) and phonological (Anthony et al., 2009) awareness

# Findings, cont'd



- Reading Comprehension

- Consistent with Genesee et al. (2006), consistent across languages irrespective of orthography
- Predicted more often cross-linguistically by more constrained cross language skills (phonological/phonemic awareness)(Feinauer et al., 2013)

- Directionality

- Increasing studies address this with variable results
  - ✦ L1 English MA <-> L2 Chinese vocabulary (Pasquarella et al., 2011)
  - ✦ L2 → L1 (EFL English-Chinese) morphological awareness (Wang et al., 2006)
  - ✦ L1 → L2 unidirectionality for vocabulary and grammatical knowledge (Gottardo et al., 2014)
  - ✦ Early English MA -> French Reading; Later French MA -> English reading (Deacon, Wade-Wooley, & Kirby, 2007)



# A challenging field

## Data exemplar from Spanish-English Longitudinal Work



- IES-funded Exploration grant (Silverman, Proctor, Haring, 2009)
- N = 156 L1 Spanish, L2 English speakers in grades 2 – 5
- 3 schools in the Northeast, 3 in the mid-Atlantic
- Cohort sequential design
  - 2 years of data collection, 4-year modeling

### *Cohort-sequential design for 2-year data collection routine*

	Fall Grade 2	Spring Grade 2	Fall Grade 3	Spring Grade 3	Fall Grade 4	Spring Grade 4	Fall Grade 5	Spring Grade 5
Cohort 1 (n = 61)	Year 1		Year 2					
Cohort 2 (n = 55)			Year 1		Year 2			
Cohort 3 (n = 40)					Year 1		Year 2	

# Measures

## English (modeled over time)

- Reading comprehension
  - Woodcock-Muñoz
  - TOSREC
  - Gates-MacGinitie
- Word reading
  - Woodcock-Muñoz
- Vocabulary
  - Woodcock-Muñoz
- Semantics
  - CELF word associations
- Morphology
  - Extract the base
- Syntax
  - CELF formulated sentences

## Spanish (one time)

- Word reading
  - Woodcock-Muñoz
- Vocabulary
  - Woodcock-Muñoz
- Syntax
  - Formulated Sentences

# Question



- Do Spanish indicators predict 5<sup>th</sup> grade reading, 5<sup>th</sup> grade reading growth from 2<sup>nd</sup> – 5<sup>th</sup> grade?
  - Alone
  - Net English predictors

# Initially exciting

## Spanish syntax predicts English reading



*Unstandardized Parameter Estimates (Standard Error)*

Parameters	Model 1	Model 2	Model 3	Model 4
<b>Fixed effects</b>				
Intercept	493.64 (1.63)*	493.43 (4.29)*	494.76 (4.26)*	499.55 (4.52)*
FARMS		0.34 (4.42)	-1.25 (4.39)	-6.34 (4.67)
Expressive Vocabulary			0.34 (0.15)*	0.29 (0.15)*
Semantics			-1.48 (1.09)	-1.34 (1.06)
Morphology			0.11 (0.18)	0.06 (0.18)
Syntax			0.13 (0.26)	0.08 (0.26)
Spanish Vocab				0.02 (0.05)
Spanish Syntax				0.47 (0.18)*
<b>Linear Slope</b>				
FARMS	6.49 (0.58)*	8.54 (1.38)*	8.74 (1.39)*	8.65 (1.51)*
Expressive Vocabulary		-2.27 (1.38)	-2.58 (1.40)	-2.76 (1.53)
Semantics			0.09 (0.05)	0.02 (0.05)
Morphology			0.10 (0.36)	0.02 (0.36)
Syntax			0.03 (0.06)	0.02 (0.06)
Spanish Vocab			0.09 (0.08)	-0.03 (0.08)
Spanish Syntax				-0.01 (.02)
				0.07 (.06)
<b>Variance Components</b>				
Intercept	173.58 (27.55)*	171.11 (27.30)*	157.51 (24.72)*	127.33 (21.48)*
Residual	0.03 (2.74)	< 0.001	< 0.001	0.54 (2.85)

*Note.* \*  $p < .05$ . FARMS = Free and reduced price meals

# Ultimately saddening English word reading overrules all



Parameters	Model 1	Model 2	Model 3	Model 4	Model 5
<b>Fixed effects</b>					
Intercept	493.64 (1.63)*	493.43 (4.29)*	494.76 (4.26)*	499.55 (4.52)*	
FARMS		0.34 (4.42)	-1.25 (4.39)	-6.34 (4.67)	-5.8
Expressive Vocabulary			0.34 (0.15)*	<b>0.29 (0.15)*</b>	.14
Semantics			-1.48 (1.09)	-1.34 (1.06)	-.41
Morphology			0.11 (0.18)	0.06 (0.18)	-.04
Syntax			0.13 (0.26)	0.08 (0.26)	.00
<b>Word Reading</b>					<b>.42</b>
Spanish Vocab				0.02 (0.05)	.02
Spanish Syntax				<b>0.47 (0.18)*</b>	.21

Spanish predicts English, *but not uniquely* (Kieffer, 2012)

# Controlled studies obfuscate



- IES-funded Development grant (Proctor, Silverman, & Haring, 2014)
- Language-based English reading curriculum
  - Developed with and for emergent Spanish-English bilinguals
- Currently under development/testing as a translanguaged curriculum (Ossa Parra, in preparation)
  - Small-group work, n = 5 students in 4<sup>th</sup> grade
  - Vocabulary, semantics and syntax in reading



# Initial findings: Different evidence cross-linguistic associations



## Cross-linguistic morphological awareness

### M = Teacher

- M: (Showing ppt.) Morfología, acuerdénse. The study of words. El estudio de las palabras.
- J: The study of words
- R: Morfología es cuando dos palabras están juntas pero en inglés comienza con una palabra y en español termina con la palabra que comenzó en inglés (*Morphology is when two words are together but in English it begins with a word and in Spanish it ends with a word that began in English*)
- M: Okay. Entonces no es la palabra completa, sino partes de palabras, cierto. (So it's not the full word, but rather parts of words, right) Entonces aquí habíamos aprendido (*so, here we have learned*) full of power, full - lleno. Powerful – poderoso, powerful – poderoso. ¿Ven todos? (*Do you see?*)
- S: Poderoso (*Powerful*)
- M: ¿Qué significa ful? (*what does -ful mean*)
- J & S: Lleno
- M: Lleno, lleno de poder (*full of power*)
- J: Lleno de energía (*full of energy*)
- M: Ajá, powerful, full of something, lleno de algo
- J: (Reading ppt.) The suffix ful means full of something
- M: Entonces es una parte que se llama (*so that is a part called*) suffix, suffix porque va al final de la palabra, cierto (*because it goes at the end of a word, right*)?
- R: Yeah
- M: ¿Dime Valentina?
- V: O maybe poderoso puede ser que uno tiene mucho, mucho poder? (*or maybe powerful could be that one has a lot of power*)
- M: Exacto. Mucho poder, lleno de poder, muy bien Valentina. (*exactly a lot of power, full of power, very good*)

# Cross-linguistic syntax



- M: (Showing a ppt.) Los adjetivos son palabras para describir las cosas, las personas, los sentimientos. Por ejemplo acá (*adjectives are word that describe things, people, feelings. For example, here*): plastic bottle. Estamos describiendo la botella. La botella es plastica (*we are describing the bottle. The bottle is plastic*), right? Botella plástica. Plastic
- D: So its an adjective
- M: Plastic toy, juguete plástico. It's an adjective, right? We are describing the bottle.
- J: (pointing at the ppt.) Dan vuelta, porque aquí dice plastic y aquí plástica (*turn around, because here it says plastic and here plástica*)
- S: (stood up to show the difference in adjective placement)
- F: Eso era lo que yo le iba a mostrar. (*That was what I was going to show*)
- M: Ustedes analizaron eso. En español el orden de los adjetivos, en español los adjetivos se ponen al final, después de la palabra que están describiendo, y en inglés se ponen antes (*You all analyzed that. In Spanish the order of adjectives, in Spanish the adjectives go at the end, after the word they are describing, and in English they come after*).
- R: Es como decir “plástica botella” en inglés
- M: Plastic, so plastic es el adjetivo que está describiendo la botella. En español se pone antes y en inglés se pone después. (*so plastic is the adjective that is describing the bottle. In Spanish is comes before and in English it comes after*)



# Concluding thoughts



- Good influx of cross-linguistic studies in 21<sup>st</sup> century
  - I don't think we need more x-lg studies of phonological/phonemic awareness
  - Few qualitative studies in x-lg literacy (Gort, 2006)
  - Where are the mixed methods studies??
- Rigor AND artificiality characterize quantitative studies
  - Do intralinguistic controls mean associations don't exist (see, e.g., Kieffer, 2012)?
  - Shelf effect of non-significant findings?
- Translanguaged discourse / pedagogy crosslinguistics align with some of the quant work
  - Teaching for transfer: “planned and systematic use of two languages for teaching and learning inside the same lesson” (Lewis, Jones, & Baker, 2012, p. 643, in Palmer, 2014)
- Translanguaging as ruminating on the full linguistic repertoire links up with the structural sensitivity hypothesis (Kuo & Anderson, 2010)

# ¡Gracias!



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