Preposition stranding in Spanish-English code-switching:

Evidence from an acceptability judgment task

Bryan Koronkiewicz
bjkoronkiewicz@ua.edu
The University of Alabama

Introduction

- Languages vary when extracting determiner phrases (DPs) from prepositional phrases (PPs) (Law, 2006; Salles, 1995)
  - English allows for such extraction, referred to as *preposition stranding* (or *p-stranding*)
  - Spanish traditionally does not allow for p-stranding, as the preposition is pied-piped with the DP

(1) Chad doesn't know [DP **what friend**]$_i$ Kevin is traveling [PP **with t**$_i$].

(2)	Fernando	no	sabe	[PP **con**	[DP **qué**	**amiga**]]$_i$	Sergio	está	viajando	**t**$_i$.
	Fernando	no	knows	with	what	friend	Sergio	is	traveling	

'Fernando doesn't know with what friend Sergio is traveling.'

(3)	*/?	Fernando	no	sabe	[DP **qué**	**amiga**]$_i$	Sergio	está	viajando	[PP **con t**$_i$].
		Fernando	no	knows	what	friend	Sergio	is	traveling	with

'Fernando doesn't know what friend Sergio is traveling with.'

Puzzle

- Yet to be tested experimentally, however, is the availability of p-stranding in code-switching

(4)

	Fernando	*no*	*sabe*	[DP ***qué***	***amiga***]	Kevin	is	traveling	[PP **with** t$_i$].
	Fernando	no	knows	what	friend				

'Fernando doesn't know what friend Kevin is traveling with.'

(5)

	Chad	doesn't	know	[DP **what**	**friend**]	*Sergio*	*está*	*viajando*	[PP ***con*** t$_i$].
						Sergio	is	traveling	with

'Chad doesn't know what friend Sergio is traveling with.'

- In other words, is it possible to extract a Spanish DP out of an English PP? Or even potentially vice versa?

P-stranding in English

- Wh-elements in English occupy a higher syntactic position, generally considered to be the specifier of the Complementizer Phrase (Chomsky, 1986)

(6)   [DP **What**]   did   you   buy t_i?

- If the wh-element is originally the complement of a PP, it can be extracted, "stranding" the preposition in its lower position (Law, 2006; Salles, 1995)

(7)   [DP **What money**]   did   you   buy   it   [PP **with** t_i]?

P-stranding in English

- P-stranding can also occur in embedded wh-contexts

(8) I don't know [DP **what friend**] you went shopping [PP **with** t_i].

- As well as in relative clauses

(9) Amy is [DP **the friend**] (that) I went shopping [PP **with** t_i].

P-stranding in Spanish

- Spanish disallows p-stranding altogether, requiring the preposition to be pied piped with the DP (Law, 2006)

(10) a. *	¿[DP **Qué**	**dinero**]	lo	compraste	[PP **con t$_i$**]?
	what	money	it	buy.2S	with
'What money did you buy it with?'					

(10) b.	¿ [PP **Con**	[DP **qué**	**dinero**]]	lo	compraste	**t$_i$**?
	with	what	money	it	buy.2S	
'With what money did you buy it?'						

P-stranding variation

- How do we account for such variation across languages?
- Law (2006) proposes that the availability of p-stranding is "related to the independent grammatical property of D incorporating into P" (p. 633)
  - Languages like Spanish are subject to a syntax-morphology-interface condition where "elements that undergo suppletive rules must form a syntactic unit X°" (Law, 2006, p. 647)
    - Based on the suppletive forms like *del* 'of the' and *al* 'to the'
    - Importantly the condition does not require suppletion; all determiners incorporate into prepositions in Spanish, with or without suppletion
  - English, lacking such suppletive forms, does not have such incorporation

P-stranding variation

- In Spanish then, the only option is to move the entire PP, as the wh-element has formed a syntactic unit with the preposition

(11)	Manuel	do	sabe	[PP [P+D **con qué**i]	[DP **t**i	**señora**]]j	Ximena	está	discutiendo	**t**j.
	Manuel	no	knows	with-what		lady	Ximena	is	arguing	

'Manuel doesn't know with what lady Ximena is arguing.'

- English, on the other hand, can extract the wh-element, since it has not incorporated

(12)   Chad doesn't know [DP **what woman**]i Megan is arguing [PP [P **with**] **t**i].
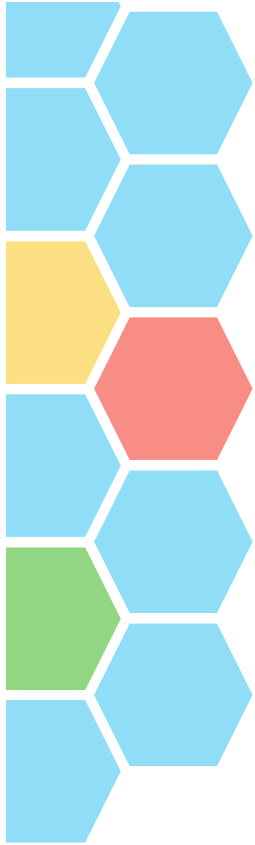
Heritage speaker bilinguals

- Heritage grammars differ from monolingual grammars (e.g., Silva-Corvalán, 1994; Montrul, 2008)

- Heritage speakers "unlike mature monolingual speakers who ultimately converge into a common steady state, exist in a linguistic continuum with no clear or easily measurable cut-off points" (Cabo y Pascual & Gómez Soler, 2015, p. 188)
  - Age of acquisition is just one of many variables that can be used to better understand differences in heritage language linguistic knowledge
  - Essentially, we can test whether simultaneous or sequential exposure to English results in different linguistic outcomes for a given grammatical property

P-stranding in heritage speaker Spanish

- Cabo y Pascual and Gómez Soler (2015)
  - 3 experimental tasks targeting *con* 'with' and *en* 'in' in wh-questions, embedded wh-, and relative clauses
    - Judgment task with p-stranding in Spanish sentences ($n = 30$)
    - Judgment task with pied-piping in Spanish sentences ($n = 30$)
    - Production task with "dehydrated" Spanish sentences ($n = 10$)
  - 2 experimental groups
    - US simultaneous heritage speakers ($n = 21$) learned both from birth
    - US sequential heritage speakers ($n = 12$) learned English after age 6
    - Intermediate/advanced proficiency in Spanish for both groups, with comparable self-ratings as well
  - 1 control group
    - Spanish native speakers ($n = 11$) born and raised in Mexico until at least the age of 16

P-stranding in heritage speaker Spanish

- Pascual y Cabo and Gómez Soler (2015) found that the two heritage speaker groups showed variability when it comes to p-stranding
  - Sequential bilinguals exhibit the aforementioned distinction
    - ✓ p-stranding in English
    - ✗ p-stranding in Spanish
  - Simultaneous bilinguals allow p-stranding in both languages
    - ✓ p-stranding in English
    - ✓ p-stranding in Spanish

Framework

- Adopting a generative approach to code-switching (Grimstad et al., 2018; MacSwan, 1999), predications can be made about restrictions on p-stranding
  - Constraints are due to the interaction of the two grammars in question, specifically when there is a mismatching of features
  - Mirrors exactly what happens in monolingual derivations (i.e., there is "no third grammar")

Research Questions:

Do heritage speakers of Spanish accept p-stranding in Spanish-English code-switching? And if so, does age of onset of bilingualism play a role?

Predictions

- Combining the heritage speaker results from Pascual y Cabo and Goméz Soler (2015) with Law's (2006) analysis, the code-switching results should vary by group
  - There should be no restriction against p-stranding in the code-switching of simultaneous bilinguals, since they allow it in both of their languages
    - There is no D+P incorporation in either their English or Spanish (unlike monolinguals), and as such the wh-element can be freely extracted
  - There should be a restriction for sequential bilinguals, but there are three different possibilities
    - It depends on which element(s) motivate(s) D+P incorporation, the determiner, the preposition, or both

Predictions

- For sequential bilinguals, if they only accept p-stranding in English and not Spanish, the code-switching results could be one of three options:
  - If incorporation is dependent only upon the determiner, p-stranding should be only accepted with English-to-Spanish switches (i.e., an English wh- with a Spanish preposition)
  - If incorporation is dependent only upon the preposition, p-stranding should be only accepted with Spanish-to-English switches (i.e., a Spanish wh- with an English preposition)
  - If incorporation is dependent upon both the determiner and the preposition, then p-stranding should be rejected in all switched cases

Hypotheses:

Simultaneous bilinguals will accept p-stranding in monolingual Spanish, monolingual English, and both code-switching contexts (i.e., Spanish-to-English and English-to-Spanish)

Sequential bilinguals will reject p-stranding in monolingual Spanish, but accept it in monolingual English, and at least some (if not all) code-switching contexts will be rejected
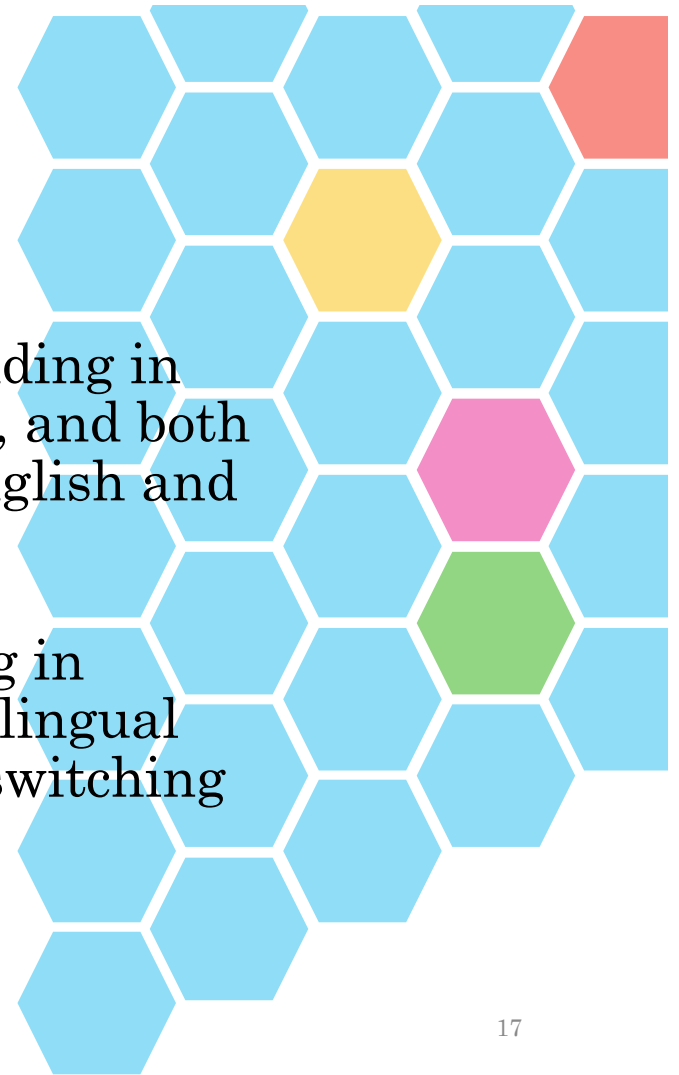
Task

- Written acceptability judgment task
  - 7-point Likert scale
    - 1 = *completely unacceptable*; 7 = *completely acceptable*
  - Completed online via Qualtrics

That guy pidió un vaso de agua.

	Completely unacceptable	Mostly unacceptable	Somewhat unacceptable	Unsure	Somewhat acceptable	Mostly acceptable	Completely acceptable
¿Qué le parece esta oración?	○	○	○	○	○	○	○

- Consent Form
- Task Training

Part 1: Start

Part 2: CODE-SWITCHING

- Judgments

- Proficiency Measure[1]
- Monolingual Judgments

Part 3: SPANISH

Part 4: ENGLISH

- Proficiency Measure[2]
- Monolingual Judgments

- Background Questionnaire

Part 5: Wrap Up
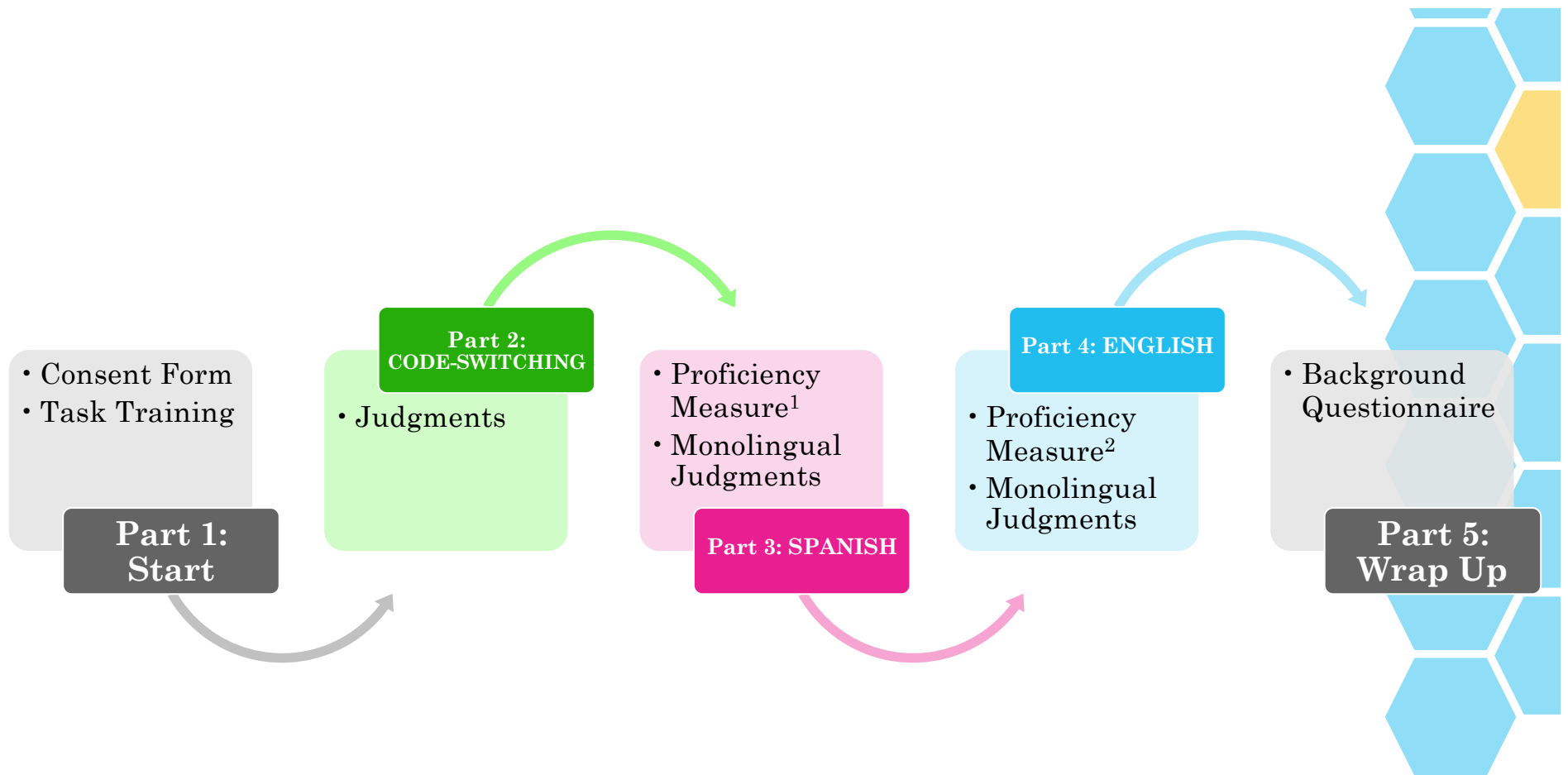
[1] Modified Spanish cloze test (Montrul & Slabakova, 2003)
[2] Modified English cloze test (O'Neill, Cornelius, & Washburn, 1981)
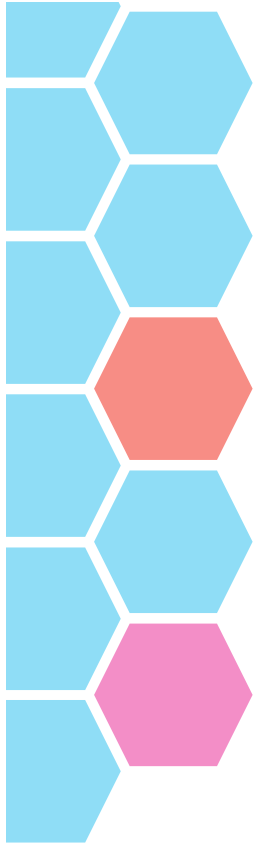
Participants

- Heritage speakers of Spanish ($N = 29$)
  - Participants removed from the dataset ($n = 5$) for either not being a self-reported code-switcher and/or for indicating a negative attitude toward code-switching (Badiola, Delgado, Sande, & Stefanich, 2018)
- Remaining participants ($n = 24$)
  - 19-49 years old ($M = 23.2$)
  - Born in the US ($n = 20$) or arrived at a young age ($M = 4.8$ years)
  - Learned both languages from a young age
    - Simultaneous heritage speakers who reported learning both languages from birth to before age 5 ($n = 13$)
    - Sequential heritage speakers who learned English later at age 5+ ($n = 11$)
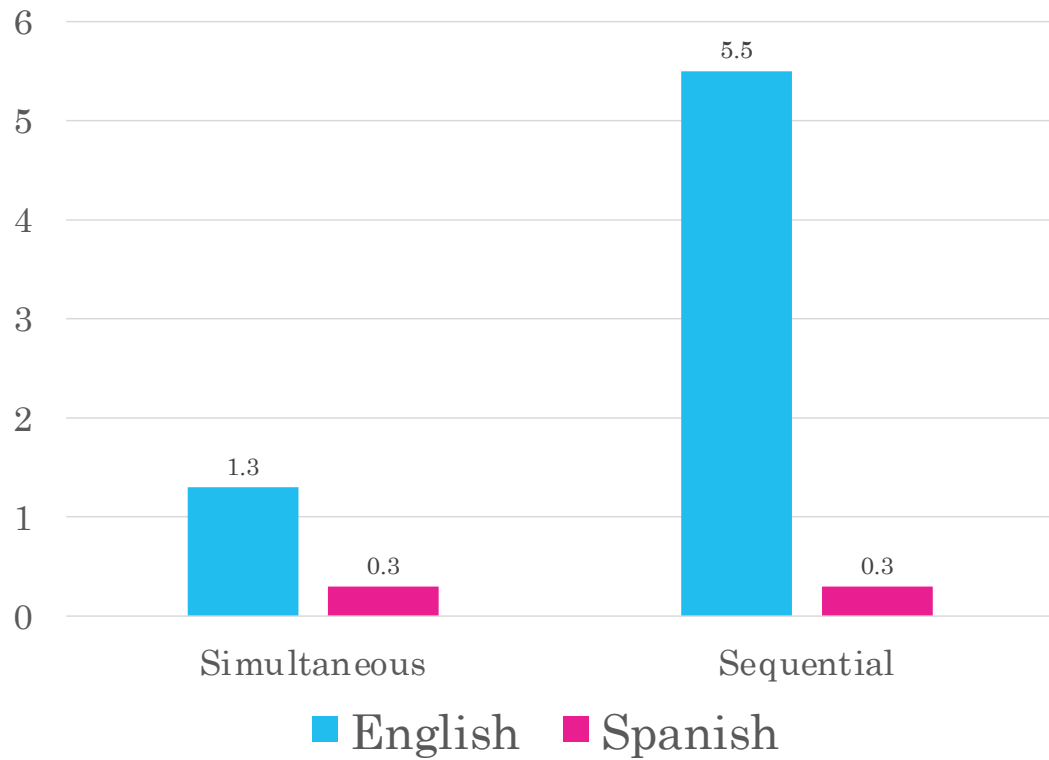
- Participant groups varied by age of acquisition for English, but not for Spanish

Age of Acquisition

	Simultaneous	Sequential
English	1.3	5.5
Spanish	0.3	0.3

■ English ■ Spanish

Language Dominance[1]

- Slightly English dominant
  ($M = 26.1$ out of ±218)
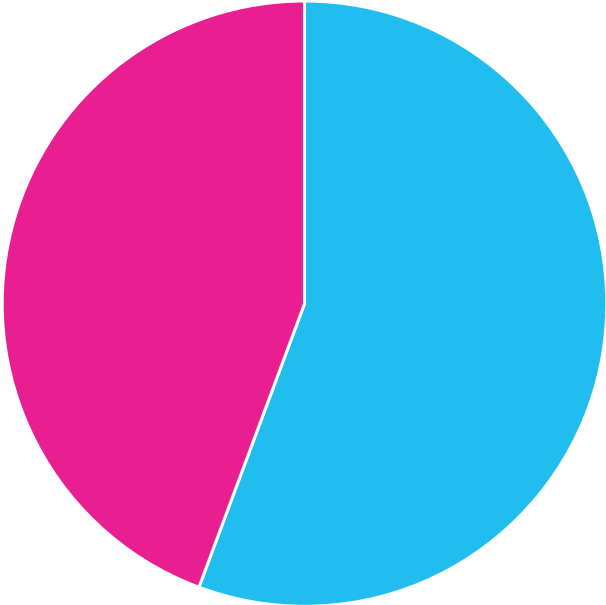
■ English ■ Spanish

- Self-rated as slightly more proficient in English

Self-Rated Proficiency

Skill	English	Spanish
Listening	5.9	5.7
Speaking	5.7	5
Reading	5.8	5.1
Writing	5.6	4.4

Score

Skill

■ English ■ Spanish

- Advanced English proficiency
- Intermediate/advanced Spanish proficiency

English Proficiency[1]

Score

40	
35	36.8
30	
25	
20	
15	
10	
5	
0	

Spanish Proficiency[2]

50	
45	
40	37.3
35	
30	
25	
20	
15	
10	
5	
0	
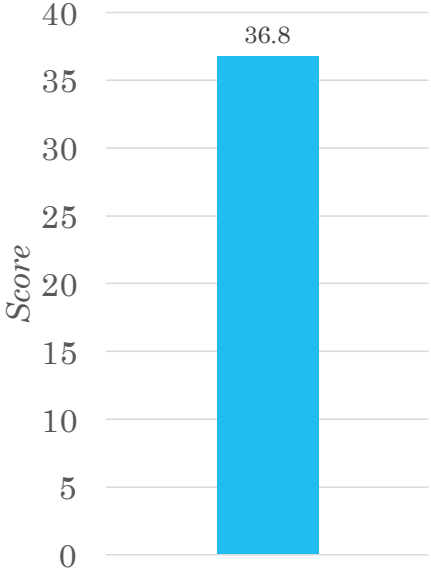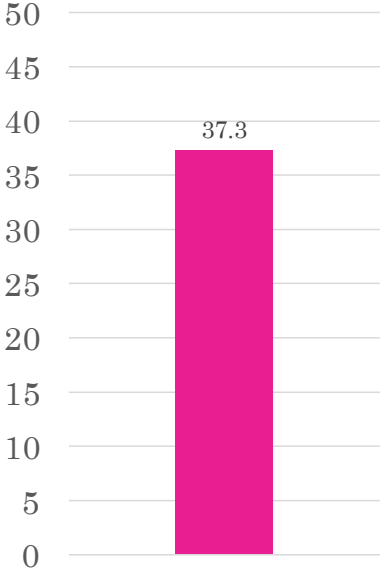
[1] Modified English cloze test (O'Neill, Cornelius, & Washburn, 1981)
[2] Modified Spanish cloze test (Montrul & Slabakova, 2003)

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Stimuli

- Target stimuli with p-stranding ($N = 32$)
  - Half embedded wh- p-stranding and half relative clause p-stranding
    - Code-switched target sentences ($n = 16$)
    - Monolingual target equivalents for Spanish ($n = 8$)
    - Monolingual target equivalents for English ($n = 8$)
- Filler stimuli with various other types of constructions (and switches) ($N = 169$)
  - Targeted adverb order, auxiliary verbs, pronouns, and so on
    - Code-switched filler sentences ($n = 89$)
    - Monolingual Spanish filler sentences ($n = 42$)
    - Monolingual English filler sentences ($n = 38$)

Embedded wh- p-stranding

(5) *Manuel* *no* *sabe* ***qué*** ***señora*** Megan is arguing **with**.

Manuel no knows what woman

'Manuel doesn't know what woman Megan is arguing with.'

(6) Bill doesn't know **what** **woman** *Ximena* *está* *discutiendo* ***con***.

Ximena is arguing with

'Bill doesn't know what woman Ximena is arguing with.'

(7) *Manuel* *no* *sabe* ***qué*** ***señora*** *Ximena* *está* *discutiendo* ***con***.

Manuel no knows what lady Ximena is arguing with

'Manuel doesn't know what lady Megan is arguing with.'

(8) Bill doesn't know **what** **woman** Megan is arguing **with**.

Relative clause p-stranding

(9) *Leticia* *es* ***la*** ***chica*** that Gabe is going out **with**.
Leticia is the girl

'Leticia is the girl that Gabe is going out with.'

(10) Lucy is **the** **girl** *que* *Arturo* *está* *saliendo* ***con***.
that Arturo is going-out with

'Lucy is the girl that Arturo is going out with.'

(11) *Leticia* *es* ***la*** ***chica*** *que* *Arturo* *está* *saliendo* ***con***.
Leticia is the girl that Arturo is going-out with

'Manuel doesn't know what lady Megan is arguing with.'

(12) Lucy is **the** **girl** that Gabe is going out **with**.

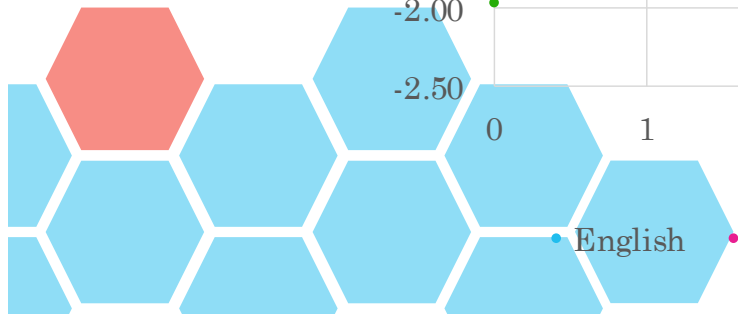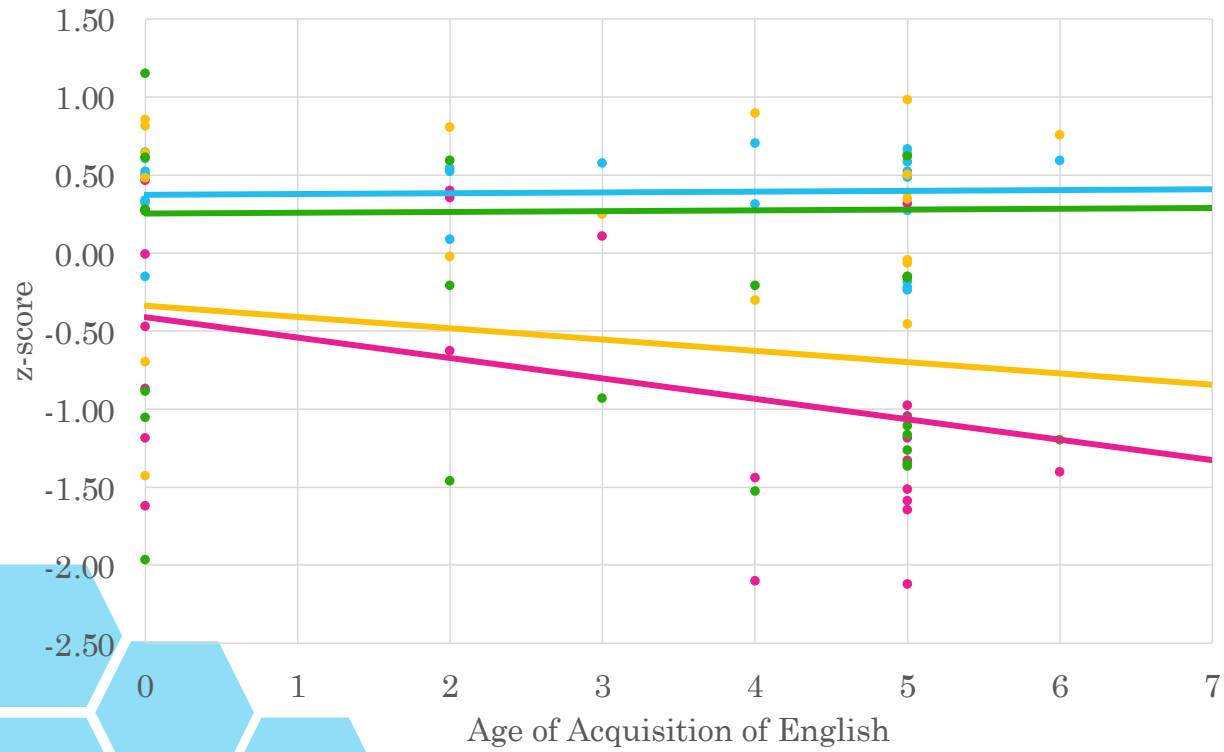Average z-score by language(s), bilingual type, and construction

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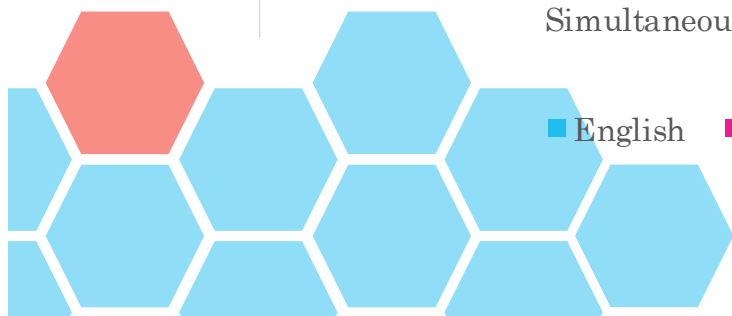
Average z-score by age of acquisition of English

Results

- The monolingual results pattern as expected
  - Sequential bilinguals showed the established asymmetry, accepting p-stranding only in English, $t(94) = 11.544$, $p < .001$
  - Simultaneous bilinguals accepted it in both, while preferring it slightly more in English, $t(94) = 4.210$, $p <. 001$

- These findings replicate those of Cabo y Pascual and Gómez Soler (2015) for heritage speakers of Spanish
  - Additionally, these results continue to provide more evidence for the availability of p-stranding in English

Results

- As for code-switching, the hypothesized outcomes were also found
  - Simultaneous accepted p-stranding in both directions, while preferring Spanish-to-English (mirroring their preference in the monolingual results)
  - Sequential bilinguals did not accept p-stranding across the board
    - Only accepted p-stranding in Spanish-to-English sentences
- An interaction was found between bilingual type and language(s), $F(3,375) = 7.777$, $p < .001$
  - Post hoc analysis revealed that the code-switching results pattern directly with the monolingual results
  - That is to say, the availability of p-stranding in code-switching follows directly from whether that preposition can be stranded monolingually by the bilingual speaker
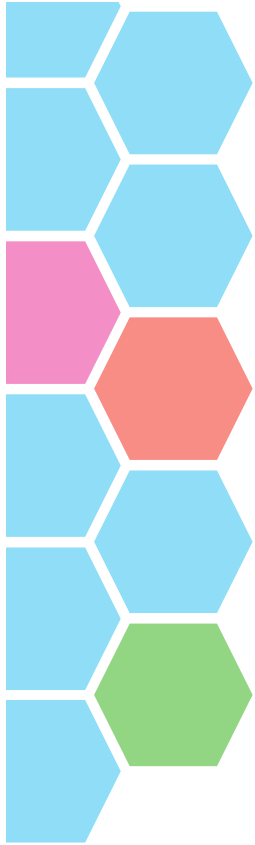
Conclusion

- Since simultaneous bilinguals' grammars allow p-stranding in both languages, there is no restriction in code-switching
  - There is no D+P incorporation in their grammars, allowing for free extraction of DPs from PPs

- However, the asymmetry found for sequential bilinguals shows that extraction of a Spanish DP out of an English PP is acceptable, but not vice versa
  - They have D+P incorporation in Spanish, which presents itself in switched contexts sometimes
  - Specifically, these results suggests that it is the preposition and not the determiner that determines incorporation

Acknowledgments
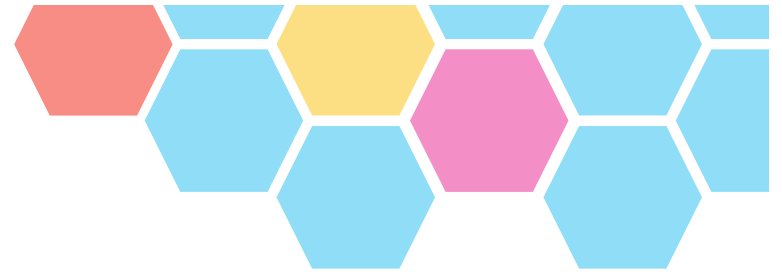
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