Code-switching acceptability in Spanish-English bilinguals: **The impact of language environment**

Bryan Koronkiewicz | bjkoronkiewicz@ua.edu

The University of Alabama

Cognitive Linguistics in the Year 2025 | September 17, 2025

Introduction

- Code-switching (CS) refers to the fluid alternation between multiple languages in a sentence or discourse

- Variety of theoretical approaches to CS (see Parafita Couto et al., 2023 for a recent overview)
  - Yet one central thread that spans multiple frameworks is the syntactic aspect of language mixing

- CS is not arbitrary
  - Bilinguals show that intraclausal switch restrictions are systematic
  - Has been noted in the literature for decades (Gumperz, 1967, 1977; Lipski, 1978; Poplack, 1980; Timm, 1975; Wentz, 1977; among others)
  - Parallel to the way monolingual utterances are constrained by grammar

(1) a. *Juana cree que* ***yo vivo*** **near** the beach.

Juana thinks that I live

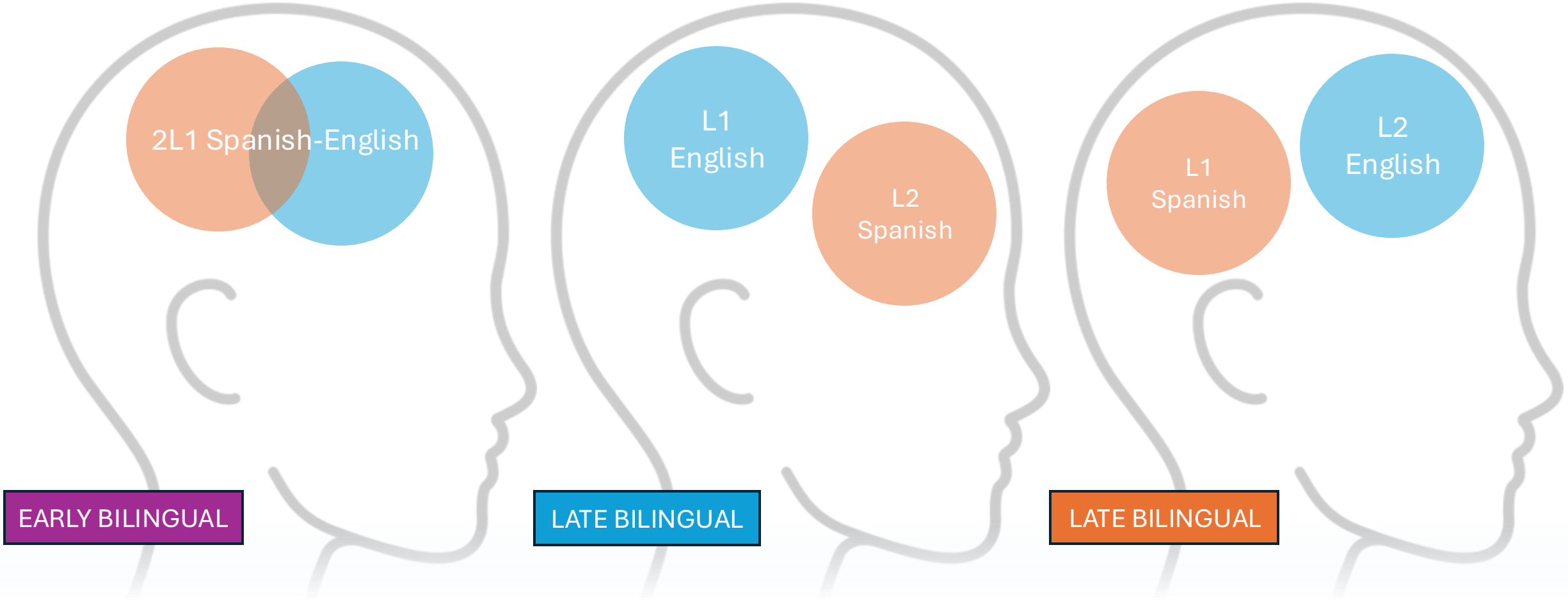
‘Juana thinks that I live near the beach.’

b. * *Juana cree que* ***yo*** **live near** the beach.

Juana thinks that I

‘Juana thinks that I live near the beach.’

“It is also striking that … **switch types** … **which occur within a single sentence**, are the ones which require the most skill. They tend to be **produced by the ‘true’ bilinguals** in the sample: speakers who learned **both languages in early childhood**.”
(Poplack, 1980, p. 615-616)



Study Aim

- Investigate to what extent the structural restrictions on intraclausal CS vary depending acquisition
  - Test both L1-English L2-Spanish and L1-Spanish L2-English late bilinguals, as compared to early bilinguals

Why late L2 code-switching?

- As with early bilinguals, L2 CS is not always a linguistic deficiency or crutch
  - L2 acquisition is associated with errors or gaps in the knowledge, so CS must be a manifestation of that
  - But they can *choose* to switch, not just because they *have* to
  - For example, Gardner-Chloros (2009) notes that although it is common for late L2 bilinguals to use CS to get around "communicative stumbling blocks," this is something that early bilinguals do as well

- Issues of proficiency and/or language dominance are tied to CS patterns (Valdés, 1976; Zentella, 1997; among others)
  - Not known whether these issues are independent of acquisition

Background

- Previous research (Giancaspro, 2015; Koronkiewicz, 2018; Toribio, 2001) has shown that late L2 bilinguals can acquire CS restrictions
  - Acceptability judgments of US L1-English L2-Spanish bilinguals
  - Typically compared to early bilinguals (i.e., heritage speakers of Spanish)

- Late bilinguals with low L2 Spanish proficiency and no prior experience with CS show "surface-level" judgments
  - For example, accepting switches where the word orders match (e.g., pronoun switches and present perfect auxiliary switches), which early bilinguals reject

- Late bilinguals with intermediate-to-advanced L2 Spanish proficiency and/or prior experience with CS show parallel judgments to early bilinguals

Research Question

- However, lack of comparison between late bilinguals who learned the same two languages in different orders
  - We know that L1-English L2-Spanish bilinguals can pattern like early bilinguals
  - What about L1-Spanish L2-English bilinguals?

- **Research question:** Does the order of language acquisition affect the acquisition of structural constraints in L2 CS?

- **Null hypothesis:** Order of acquisition will not play a role, meaning that L1-Spanish L2-English bilinguals will pattern similarly

Participants

- Recruitment of either early or late Spanish-English bilinguals (*N* = 139)
- Vast majority scored at an intermediate-to-advanced proficiency in both languages
  - Low proficiency score participants (*n* = 14) were removed from the dataset
- Of the remaining participants, all but 3 fell into one of the following groups:
  - Heritage speakers of Spanish in the US (*n* = 48, simultaneous/early sequential)
  - Late L2 Spanish bilinguals in the US (*n* = 30, L1 = English)
  - Late L2 English bilinguals in Spain (*n* = 44, L1 = Spanish)

Participant Overview

		US HERITAGE		US L2 SPANISH		SPAIN L2 ENGLISH	
		M (SD)	Min - Max	***M (SD)***	Min - Max	***M (SD)***	Min - Max
AGE		21.27 (2.39)	18 to 31	21.73 (2.75)	19 to 29	20.50 (2.23)	18 to 29
ENGLISH	**Age of Acquisition**	**1.91 (2.25)**	**0 to 7**	**0.10 (0.55)**	**0 to 3**	**4.26 (1.34)**	**3 to 8**
Proficiency Test	**Score**	**36.17 (1.80)**	**29 to 39**	**37.33 (1.40)**	**33 to 39**	**33.86 (4.53)**	**20 to 38**
Self Ratings	Speaking	5.85 (0.36)	5 to 6	5.97 (0.18)	5 to 6	4.70 (0.93)	3 to 6
	Understanding	5.96 (0.20)	5 to 6	6.00 (0.00)	6 to 6	4.98 (1.02)	2 to 6
	Reading	5.94 (0.24)	5 to 6	5.93 (0.25)	5 to 6	5.16 (0.94)	2 to 6
	Writing	5.79 (0.54)	3 to 6	5.97 (0.18)	5 to 6	4.75 (0.99)	2 to 6
SPANISH	**Age of Acquisition**	**1.49 (2.43)**	**0 to 7**	**12.83 (1.70)**	**9 to 16**	**0.09 (0.36)**	**0 to 2**
Proficiency Test	**Score**	**35.98 (6.11)**	**25 to 48**	**34.90 (6.02)**	**25 to 46**	**46.55 (2.37)**	**37 to 49**
Self Ratings	Speaking	4.46 (1.07)	2 to 6	3.70 (1.15)	1 to 6	5.77 (0.48)	4 to 6
	Understanding	5.04 (0.94)	3 to 6	4.07 (0.94)	2 to 6	5.93 (0.25)	5 to 6
	Reading	4.58 (1.01)	3 to 6	4.23 (1.10)	1 to 6	5.89 (0.39)	4 to 6
	Writing	4.33 (1.04)	2 to 6	4.17 (1.15)	2 to 6	5.70 (0.59)	3 to 6
DOMINANCE	**BLP Score**	**47.17 (43.50)**	**-48.85 to 109.53**	**105.63 (28.07)**	**31.39 to 146.02**	**-76.62 (26.77)**	**-169.20 to 15.26**

Stimuli Tested

Subject pronoun switches (*n* = 48)

- *Megan says that **he vive** en un apartamento*
- *Magdalena dice que **él lives** in an apartment*

⟸ Today's Talk

Pre-verbal and post-verbal adverb switches (*n* = 72)

- *Amy **always adivinaba** cuando no sabía la respuesta*
- *Amy **guessed siempre** cuando no sabía la respuesta*
- *Araceli **adivinaba always** when she didn't know the answer*
- *Araceli **siempre guessed** when she didn't know the answer*

Inalienable object switches (*n* = 54)

- *Gregory had two ugly pimples, so before going to sleep he **washed la** cara*
- *Gregory had two ugly pimples, so before going to sleep he **washed su** cara*
- *Gustavo tenía dos granitos feos, así que antes de dormir **lavó his** face*
- *Gustavo tenía dos granitos feos, así que antes de dormir **lavó the** face*
- *Gustavo tenía dos granitos feos, así que antes de dormir **se lavó his** face*
- *Gustavo tenía dos granitos feos, así que antes de dormir **se lavó the** face*

Pronoun Stimuli

- Target stimuli (*n* = 16)
  - Spanish pronouns switched with a finite English verb (*n* = 10)
    - 10 Spanish subject pronouns: *yo, tú, usted, él, ella, nosotros, nosotras, ustedes, ellos, ellas*
  - English pronouns switched with a finite Spanish verb (*n* = 6)
    - 6 English subject pronouns: *I, you, he, she, we, they*
  - All pronouns the subject of an embedded clause
    - Matrix clause matched the language of the pronoun, while the rest of the embedded clause matched the language of the verb

- Control stimuli (*n* = 32)
  - Same Spanish-to-English (*n* = 10) and English-to-Spanish (*n* = 6) sentences, but moving the switch to after the verb (i.e., an adjunct switch)
  - Same sentences but entirely in Spanish (*n* = 10) or English (*n* = 6)

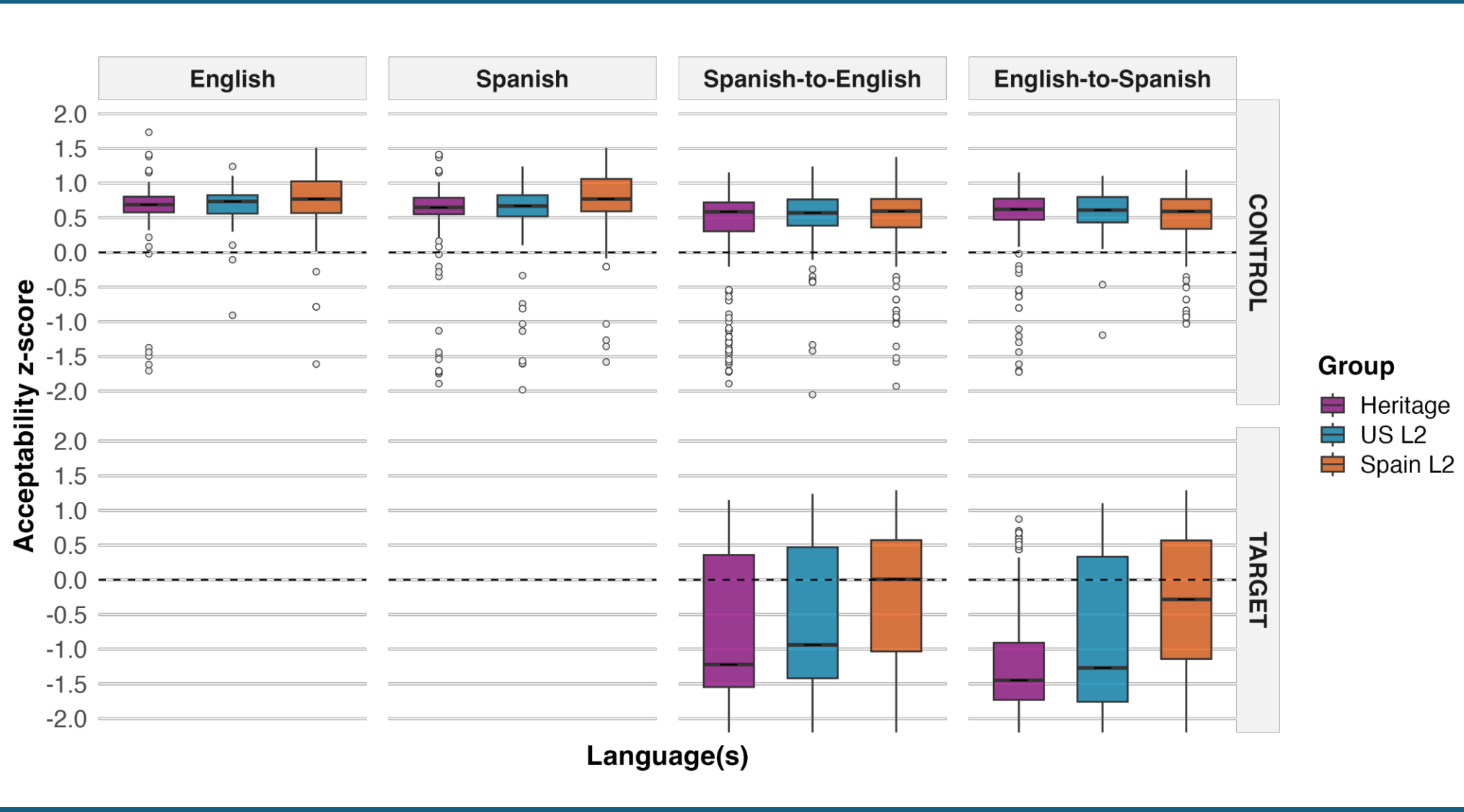
Sample Stimuli

	ENGLISH	SPANISH	SPANISH-to-ENGLISH	ENGLISH-to-SPANISH
CONTROL	Megan says that **he lives** in an apartment.	Magdalena dice que **él vive** en un apartamento.	*Magdalena dice que* ***él vive*** in an apartment.	Megan says that **he lives** *en un apartamento*.
TARGET	N/A	N/A	* *Magdalena dice que* ***él*** **lives** in an apartment.	* Megan says that **he** ***vive*** *en un apartamento*.

Task Overview

- Written acceptability judgment task (AJT) via Qualtrics
  - Included training which primed them first to be in bilingual mode (González-Vilbazo et al., 2013)
- Evaluated CS and monolingual sentences (in separate blocks) on a 7-point Likert scale
  - 1 = *Completely unacceptable*; 7 = *Completely acceptable*
- Language background components:
  - Written proficiency measures in Spanish (Montrul & Slabakova, 2003) and English (O'Neill et al., 1981)
  - Bilingual Language Profile (BLP; Birdsong et al., 2012)

Pronoun Stimuli Acceptability



Linear Mixed Effects Models

- Models Tested
  - **Model 1:** language(s) * condition
  - **Model 2:** language(s) * condition * heritage_speaker
  - **Model 3:** language(s) * condition * participant_group

- Variables
  - **language(s):** English, Spanish, Spanish-to-English, English-to-Spanish
  - **condition:** target (i.e., ungrammatical), control (i.e., grammatical)
  - **heritage_speaker**: yes (i.e., heritage group), no (i.e., L2 groups)
  - **bilingual_group:** US Heritage, US L2, Spain L2
  - All included random slopes for **participant** and **item**

LLM Results

- Model comparison
  - Model 2 vs Model 1: $\chi^2 = 126.53$, $p < .001$
    - Adding **heritage_speaker** greatly improves fit
  - Model 3 vs Model 2: $\chi^2 = 17.34$, $p = .008$
    - Adding **participant_group** further improves fit
  - **Model 3 is the best-fitting model** (lowest AIC/BIC), indicating that separating L2 groups adds meaningful explanatory power beyond heritage yes/no

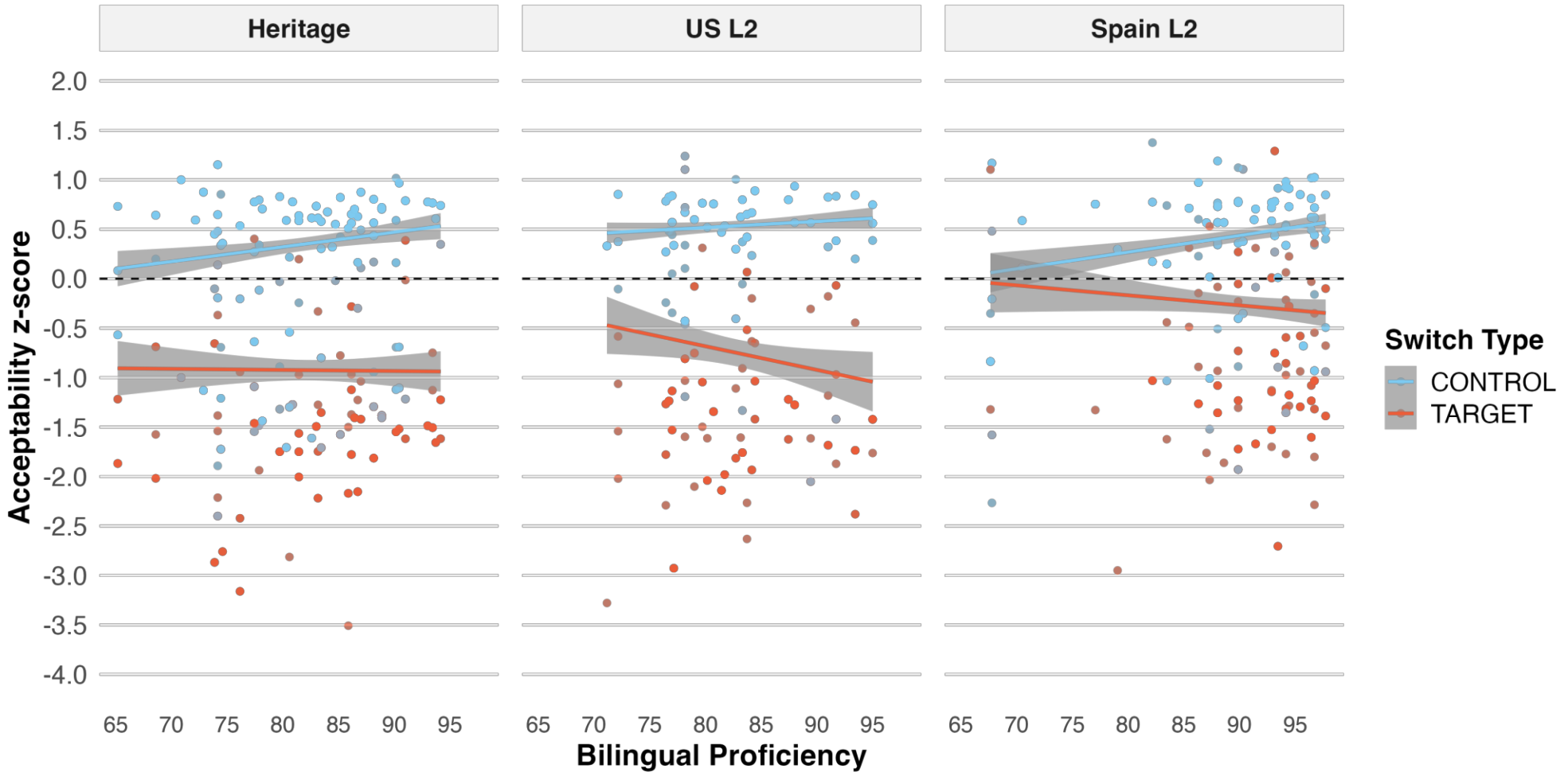
- Model 3 effects
  - Strong main effects of **condition** and **language**, plus a significant **language * condition** interaction
    - Ungrammatical stimuli were rated lower, but within CS English-to-Spanish switches were the most rejected
  - **participant_group** interacts with **language** and with **condition**
    - The different groups are not rating the different stimuli the same
    - Most-to-least differentiation between stimuli conditions: US Heritage > US L2 > Spain L2

Research Question Revisited

- **Research question:** Does the order of language acquisition affect the acquisition of structural constraints in L2 CS?
  - **Null hypothesis <u>not</u> confirmed:** Results suggest that order of acquisition **<u>does</u>** seem play a role, as L2 English bilinguals were less likely to reject pronoun switches than L2 Spanish bilinguals

- How come?
  - Something about acquiring English after Spanish instead of the other way around results in not rejecting pronoun switches consistently
    - No immediately clear reason why that would be the case
  - Although both groups are late L2 bilinguals in academic settings, their L1 contexts are likely quite distinct regarding CS exposure (US vs. Spain)
  - Maybe there is some other factor that is intervening, such as proficiency
    - All participants scored as intermediate-to-advanced in both languages, but that does not mean that there was homogeneity

Pronoun Stimuli Acceptability



Bilingual proficiency calculated by converting the individual English and Spanish scores into a percentage (number correct out of 40 for English and out of 50 for Spanish), and then averaging those

LMMs Revisited

- What effect does adding bilingual proficiency to the LMMs have?
  - Adding bilingual proficiency alone (without heritage or participant_group) improves model fit (χ^2= 17.87, p = 0.006), but not as much as participant_group does
  - Adding proficiency interactions to the heritage model does not improve fit (χ^2 = 7.97, p = .240)
  - Adding proficiency interactions to the participant_group model does significantly improve fit (χ^2 = 42.78, p < .001)

- Adding bilingual proficiency does improve our understanding of the data, but not as a standalone predictor
  - Its contribution is most meaningful when considered in interaction with the L2 participant groups

Limitations & Future Directions

- Acquisition is not the only distinguishing factor between the two late L2 bilingual groups
  - Could do a proficiency-matched analysis
  - How much does geographical location / exposure to CS matter?
    - Could test each group in the opposite context (i.e., L2 Spanish bilinguals in Spain and L2 English bilinguals in the US)
    - Could include the Bilingual Code-Switching Profile (Olson, 2022) to measure this variable in more detail

- Analysis of one specific types of CS restriction (i.e., pronoun switches)
  - Need to continue the analysis to the other types of CS patterns
  - Preliminary analysis shows that the L2 groups diverge in those other switch types as well

- Examine additional bilingual populations
  - For example, other language pairs

Conclusion

- This study supports the idea that structural constraints on CS can be learned by late L2 bilinguals
- Further analysis and research is needed to understand the role of language acquisition order with regard to CS
- The findings continue to enhance our understanding of bilingual competence and the non-arbitrary nature of language mixing

References

Balam, O., Parafita Couto, M. C., & Stadthagen-González, H. (2020). Bilingual verbs in three Spanish/English code-switching communities. *International Journal of Bilingualism*, *24*(5-6), 952-967.

Birdsong, D., Gertken, L. M., & Amengual, M. (2012). *Bilingual Language Profile: An easy-to-use instrument to assess bilingualism*. COERLL, University of Texas at Austin. https://sites.la.utexas.edu/bilingual/

Ellison, T. M., & Si, A. (2021). A quantitative analysis of age-related differences in Hindi-English code-switching. *International Journal of Bilingualism*, *25*(6), 1510-1528.

Faroqi-Shah, Y., & Wereley, S. (2022). Investigation of code-switching cost in conversation and self-paced reading tasks. *International Journal of Bilingualism*, *26*(3), 308-333.

Gardner-Chloros, P. (2009). Acquiring code-switching: Code-switching in children (and L2 learners). In *Code-switching* (pp. 142-164). Cambridge University Press.

Giancaspro, D. (2015). Code-switching at the auxiliary-VP boundary: A comparison of heritage speakers and L2 learners. *Linguistic Approaches to Bilingualism*, *5*(3), 379-407.

González-Vilbazo, K., Bartlett, L., Downey, S., Ebert, S., Heil, J., Hoot, B., Koronkiewicz, B., & Ramos, S. E. (2013). Methodological considerations in code-switching research. *Studies in Hispanic and Lusophone Linguistics*, *6*(1), 119-138.

Gumperz, J. J. (1967). On the linguistic markers of bilingual communication. *Journal of Social Issues*, *23*(2), 48-57.

Gumperz, J. J. (1977). The sociolinguistic significance of conversational code-switching. *RELC Journal*, *8*(2), 1-34.

Hennecke, I., & Wiesinger, E. (2023). Language contact phenomena in multiword units: The code-switching–calquing continuum. *International Journal of Bilingualism*, *0*(0), 13670069231190209.

Heredia, R. R., Angelovska, T., & Cieślicka, A. B. (2022). An online (r)examination of frequency and context effects in code-switching using the auditory moving window. *International Journal of Bilingualism*, *26*(6), 695-709.

Kniaź, M., & Zawrotna, M. (2021). Embedded English verbs in Arabic-English code-switching in Egypt. *International Journal of Bilingualism*, *25*(3), 622-639.

Koronkiewicz, B. (2018). Acquiring L1-English L2-Spanish code-switching: The role of exposure to language mixing. *Languages*, *3*(3), 26.

Lipski, J. M. (1978). Codeswitching and the problem of bilingual competence. In M. Paradis (Ed.), *Aspects of bilingualism* (pp. 250-264). Hornbeam Press.

Liu, H., Liu, Z., Yuan, M., & Chen, T. (2024). The effect of cognitive load on code-switching. *International Journal of Bilingualism*, *28*(3), 513-530.

Montrul, S., & Slabakova, R. (2003). Competence similarities between native and near-native speakers: An investigation of the preterite-imperfect contrast in Spanish. *Studies in Second Language Acquisition*, *25*(3), 351-398.

Nguyen, L. (2024). Rethinking the matrix language: Vietnamese-English code-switching in Canberra. *International Journal of Bilingualism*, *0*(0), 13670069241254454.

Núñez-Román, F., Gómez-Camacho, A., Fernández-Juliá, O., & Quintero-Rodríguez, I. (2025). English code-mixings in WhatsApp interactions among Spanish adolescents and their orthographic competence. International Journal of Bilingualism, 29(3), 534-548. https://doi.org/10.1177/13670069241229397

O'Neill, R., Cornelius, E. T., & Washburn, G. N. (1981). *American kernel lessons: Advanced student's book*. Longman.

Olson, D. J. (2022). The Bilingual Code-Switching Profile (BCSP): Assessing the reliability and validity of the BCSP questionnaire. *Linguistic Approaches to Bilingualism*, *14*(3), 400-433.

Parafita Couto, M. C., Bellamy, K., & Ameka, F. K. (2023). Theoretical linguistic approaches to multilingual code-switching. In A. Chaouch-Orozco, E. Puig-Mayenco, J. Rothman, J. Cabrelli, J. González Alonso, & S. M. Pereira Soares (Eds.), *The Cambridge handbook of third language acquisition* (pp. 403-436). Cambridge University Press.

Poplack, S. (1980). Sometimes I'll start a sentence in Spanish y termino en español: Toward a typology of code-switching. *Linguistics*, *18*(7-8), 581-618.

Si, A., & Mark Ellison, T. (2023). Inter-individual differences in Hindi–English code-switching: A quantitative approach. *International Journal of Bilingualism*, *27*(3), 306-330.

Soesman, A., & Walters, J. (2021). Codeswitching within prepositional phrases: Effects of switch site and directionality. *International Journal of Bilingualism*, *25*(3), 747-771.

Timm, L. A. (1975). Spanish-English code-switching: El porque and how-not-to. *Romance Philology*, *28*(4), 473-482.

Treffers-Daller, J. (2025). The Simple View of borrowing and code-switching. International Journal of Bilingualism, 29(2), 347-370. https://doi.org/10.1177/13670069231168535

Valdés, G. (1976). Social interaction and code-switching patterns. In G. D. Keller, R. V. Teschner, & S. Viera (Eds.), *Bilingualism in the bicentennial and beyond*. Bilingual Press.

Verschik, A. (2021). Yiddish–Slavic language contact in multilingual songs: Describing deliberate code-switching. *International Journal of Bilingualism*, *25*(6), 1696-1717.

Wang, W. (2024). Insertional code-switching as interactional resource in Mandarin–English bilingual conversation. *International Journal of Bilingualism*, *0*(0), 13670069241253997.

Wentz, J. P. (1977). *Some considerations in the development of a syntactic description of code-switching* (Doctoral dissertation). Retrieved from http://hdl.handle.net/2142/66702

Yahiaoui, R., Aldous, M. J., & Fattah, A. (2021). Functional and sociocultural attitudes of code-switching and its relation to the meaning-making process: The case of dubbing Kim Possible into Arabic. *International Journal of Bilingualism*, *25*(5), 1349-1368.

Yim, O., & Clément, R. (2021). Acculturation and attitudes toward code-switching: A bidimensional framework. *International Journal of Bilingualism*, *25*(5), 1369-1388.

Zentella, A. C. (1997). *Growing up bilingual: Puerto Rican children in New York*. Blackwell Publishing.

¡Gracias! | bjkoronkiewicz@ua.edu