Examining the impact of **language dominance** in Spanish-English **code-switching** restrictions

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CS restrictions

- There are structural restrictions in code-switching (CS)
  a. *Hace un minuto yo pedí* a beer at the bar.
  b. **Hace un minuto yo* ordered a beer at the bar.
  c. The library doesn't open *los domingos por la mañana.*
  d. *The library doesn't *abre los domingos por la mañana.*
  e. *Su hermano* has trained at the gym every day.
  f. **Su hermano ha* trained at the gym every day.

- Broader question: what factors influence whether bilinguals adhere to CS contraints or follow these patterns?

- For this project we focus on language dominance

Dominance

- Language dominance
  - “Observable asymmetries of skill in or use of one language over the other” (Birdsong, 2014, p. 374)
- Various factors shape language dominance
  - Age of acquisition
  - Frequency
    - Social settings
    - Academic settings
    - Professional settings
  - “Most bilinguals use their languages for different purposes, in different situations, with different people” (Grosjean, 2010, p. 21)
  - “Periods of stability, of varying duration, and then periods of language reorganization during which an existing language may be strengthened, another may lose its importance, yet another may be acquired” (Grosjean, 2010, p. 89)

Proficiency

- Language proficiency is the overall level of:
  - Linguistic ability
  - Competence
    - Speaking
    - Listening
    - Reading
    - Writing
- Proficiency is related to dominance
  - If L_A is used more frequently → more dominant in the language → more proficient in that language
  - But is not a 1:1 ratio
    - A speaker might be dominant in one language, but still be highly proficient in the other language
    - Proficiency might impact some phenomena, but dominance might not, and vice versa

CS and Dominance

- A psycholinguistic perspective
  - Is there a processing cost?
  - There is no switching cost, even if dominance is not equal between languages (Adamou & Shen, 2019)

CS and Dominance

- Others have looked at syntactic structures
  - Petersen (1988) - Danish/English
    - Grammatical morphemes must come from the dominant language
    - The *dukke* 'the doll'
      - English dominant language → use of English 'the'
        - **de* doll 'the doll'
      - Unbalanced English/Dutch bilinguals → produce code-switched DPs
      - This is not always the case (Liceras et al., 2016)
  - In Petersen's analysis
    - Proficiency impacts code-switching, not dominance
      - If two bilinguals = dominance
      - But one is less proficient in English than the other
      - Less proficient in English → *la* house

CS and Dominance

- CS structures are tied to dominance
  - Liceras et al. (2016)
    - “Language dominance (in the case of simultaneous bilinguals) and nativeness (the difference between L1 and L2 acquisition) can be evaluated in terms of the degree to which Spanish-English bilinguals adhere to restrictions on CS” (p. 109).
    - Conclude → Nativeness crucial to understand results. Dominance is less clear.
    - Participants were child bilinguals and/or adult L2 bilinguals
- No work on CS acceptability has looked at adult simultaneous and/or sequential bilinguals

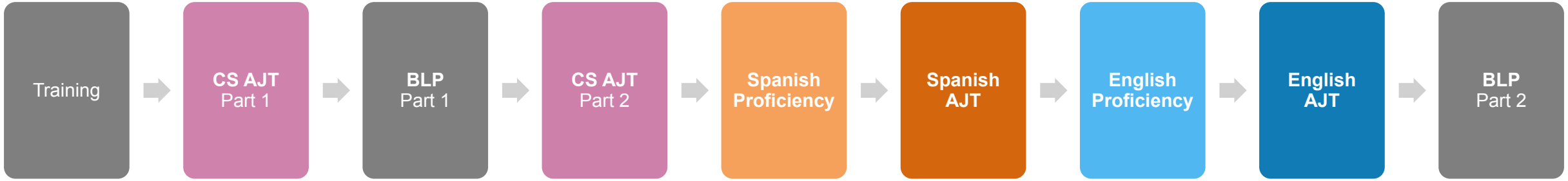
RQs and Hypotheses

- **Research question:** Does language dominance affect acceptability ratings in the Spanish-English CS of adult early-bilinguals?

- Two possible outcomes:
  - **Hypothesis 1:** Participants who are either English or Spanish dominant will rate grammatical and ungrammatical switches more similarly (i.e., less of a difference in mean ratings) than participants who are more balanced
  - **Hypothesis 2:** Regardless of language dominance, participants will rate the conditions consistently (i.e., the same difference in ratings)

Task Overview

- Written **acceptability judgment task** (AJT) via Qualtrics completed by adult simultaneous/early sequential bilinguals (*N* = 21) in northern/central Illinois, USA
  - Included training which primed them first to be in bilingual mode (González-Vilbazo et al., 2013)
- Part of a larger project where CS and monolingual sentences were evaluated (in separate blocks) on a **7-point Likert scale**
  - 1 = *Completely unacceptable*; 7 = *Completely acceptable*
- Language background components:
  - Multiple-choice, written **Spanish proficiency measure** (Montrul & Slabakova, 2003)
  - Multiple-choice, written **English proficiency measure** (O'Neill et al., 1981)
  - **Bilingual Language Profile** (BLP; Birdsong et al., 2012)



Participant Overview

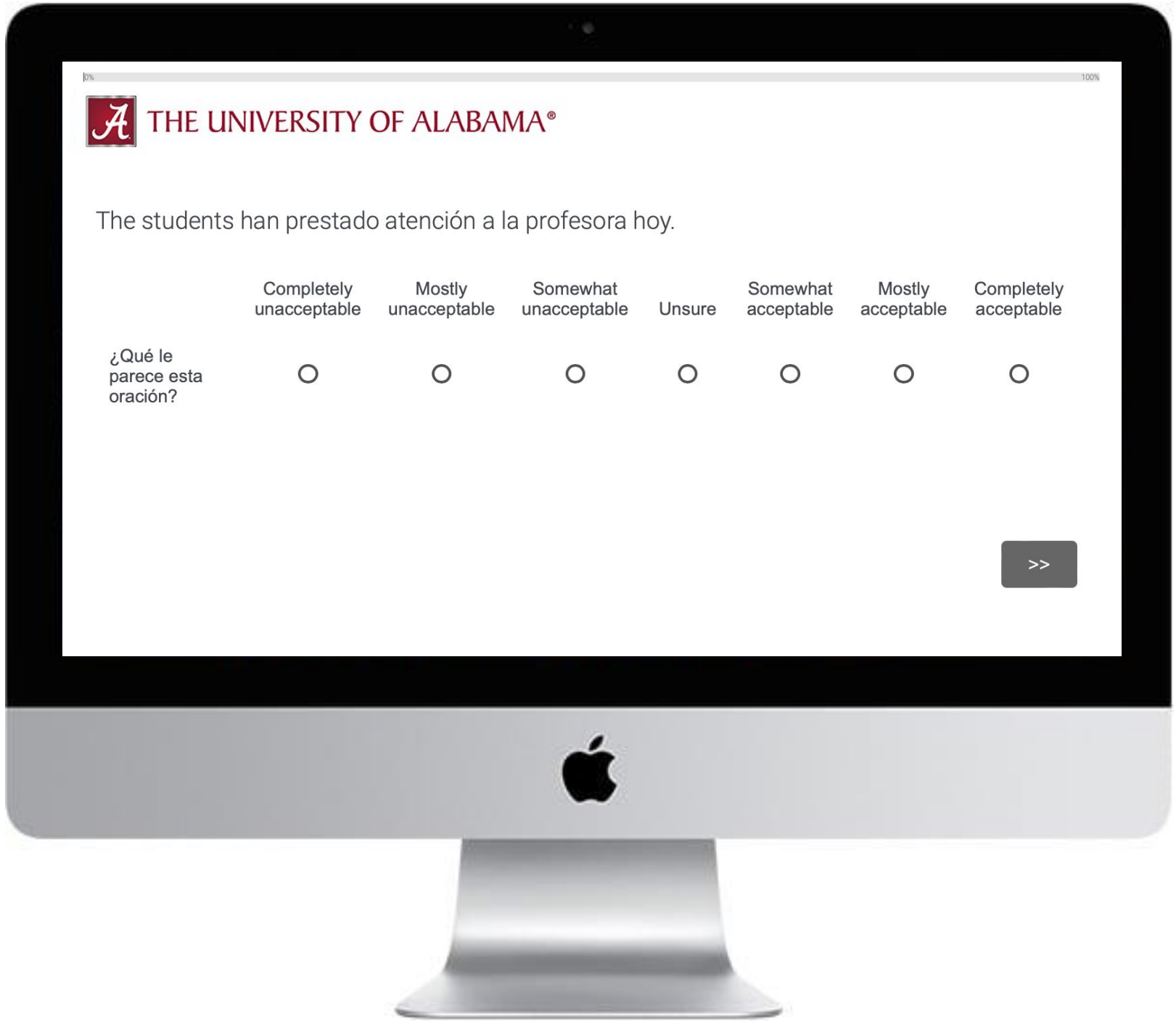
		M	*SD*	Min	Max
Age		**29.0**	5.3	19.0	38.0
English	*Age of Acquisition*	**2.5**	2.5	0.0	7.0
	Proficiency Score (of 40)	**36.2**	2.3	30.0	39.0
	Self-Rating Score	**4.5**	0.3	4.0	4.8
Spanish	*Age of Acquisition*	**0.4**	1.2	0.0	5.0
	Proficiency Score	**38.3**	7.1	22.0	47.0
	Self-Rating Score	**3.6**	0.8	2.4	4.8
Language Dominance Score		**40.1**	40.6	-62.6	128.0

Stimuli

- Target stimuli (*n* = 24)
  - **2** x **3** x **2** x **2** design
  - *Conditions:* **Grammatical** switches vs. **ungrammatical** switches
  - *Switch structures:* Subject **pronouns**, **negation**, and present perfect **auxiliary** verbs
  - *Switch direction:* **Spanish-to-English** and **English-to-Spanish**
  - *Lexicalizations:* **2 per structure**
    - *I ordered / yo pedí…, you bought / tú compraste…*
    - *doesn't open / no abre…, don't go / no van…*
    - *have paid / han prestado…, has trained / ha entrenado…*
- Randomized for each individual participant
  - Presented one at a time

Sample Stimuli

STRUCTURE	DIRECTION	CONDITION	BEGINNING	MIDDLE		END
PRO	SP-to-EN	GRAMMATICAL	*Hace un minuto*	*yo*	*pedí*	a beer at the bar.
		UNGRAMMATICAL	** Hace un minuto*	*yo*	ordered	a beer at the bar.
	EN-to-SP	GRAMMATICAL	A minute ago	I	ordered	*una cerveza en el bar.*
		UNGRAMMATICAL	* A minute ago	I	*pedí*	*una cerveza en el bar.*
NEG	SP-to-EN	GRAMMATICAL	*La biblioteca*	*no*	*abre*	on Sunday mornings.
		UNGRAMMATICAL	** La biblioteca*	*no*	open	on Sunday mornings.
	EN-to-SP	GRAMMATICAL	The library	doesn't	open	*los domingos por la mañana.*
		UNGRAMMATICAL	* The library	doesn't	*abre*	*los domingos por la mañana.*
AUX	SP-to-EN	GRAMMATICAL	*Su hermano*	has	trained	at the gym every day.
		UNGRAMMATICAL	** Su hermano*	*ha*	trained	at the gym every day.
	EN-to-SP	GRAMMATICAL	His brother	*ha*	*entrenado*	*en el gimnasio todos los días.*
		UNGRAMMATICAL	* His brother	has	*entrenado*	*en el gimnasio todos los días.*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THE UNIVERSITY OF ALABAMA®
The students han prestado atención a la profesora hoy.
Completely unacceptable
Mostly unacceptable
Somewhat unacceptable
Unsure
Somewhat acceptable
Mostly acceptable
Completely acceptable
¿Qué le parece esta oración?
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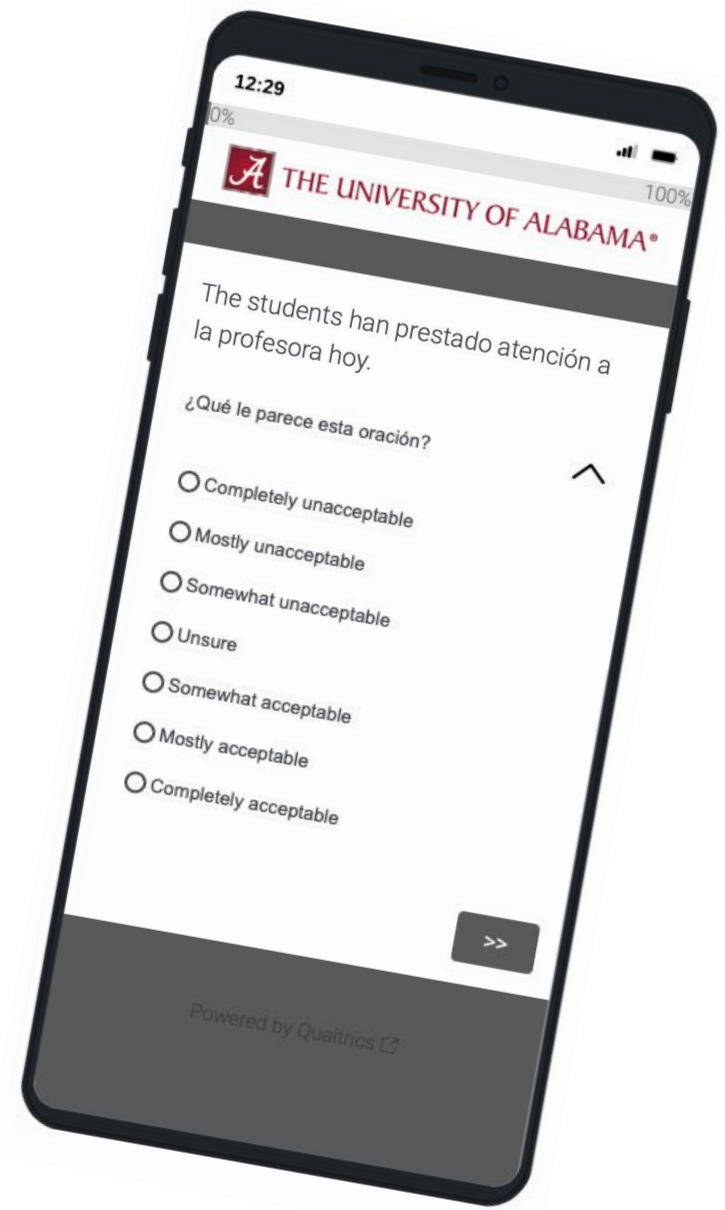
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The students han prestado atención a la profesora hoy.
¿Qué le parece esta oración?
Completely unacceptable
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Mostly acceptable
Completely acceptable
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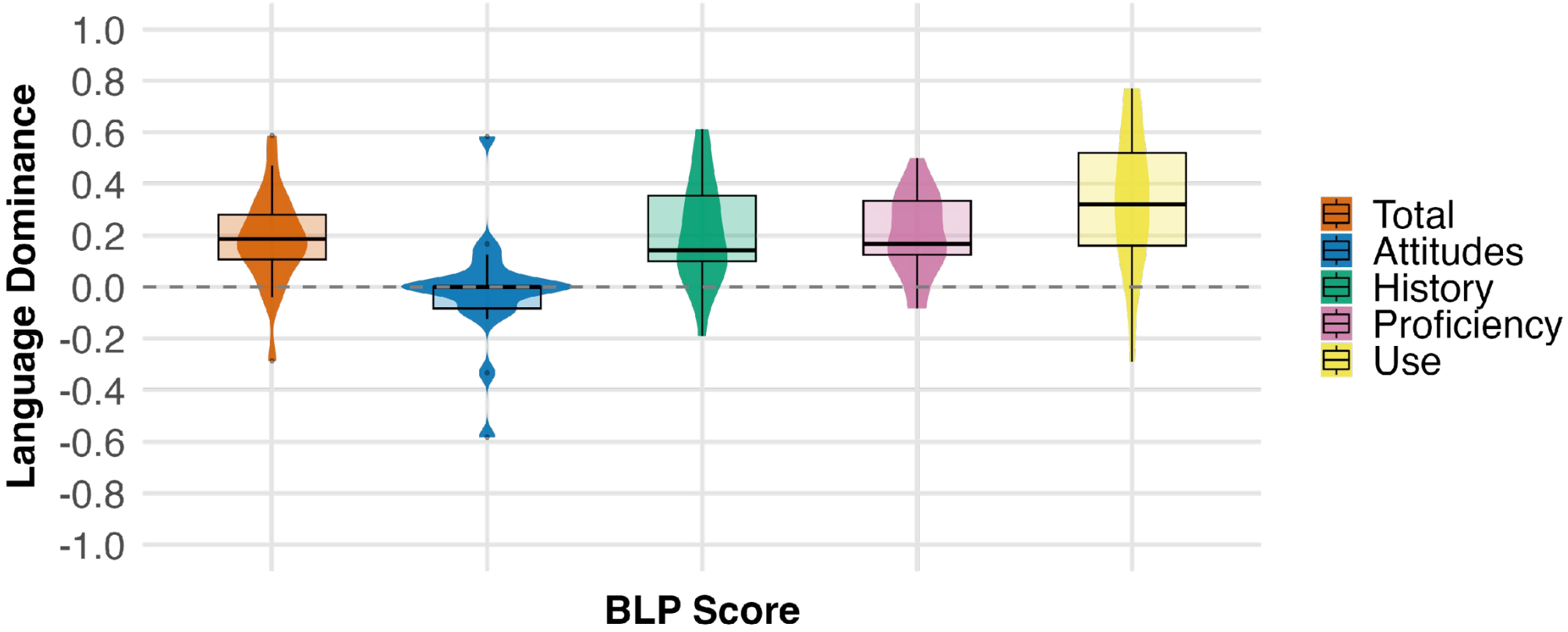
Data Pre-processing

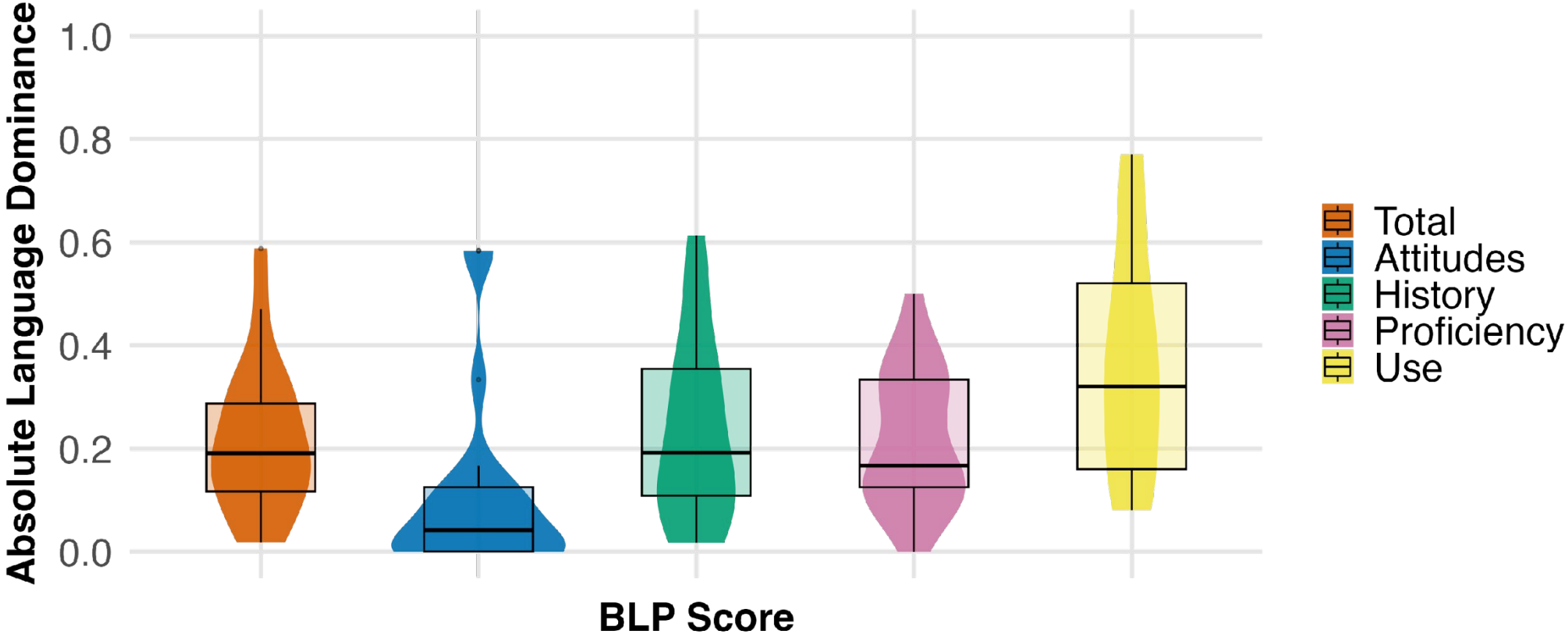
- Overall language dominance following BLP guidelines (Birdsong et al., 2012)
  - Scored from -218 to +218, with a positive score indicating more English dominance, whereas a negative one indicates more Spanish dominance
- Maintained separate subsection scores for:
  - **Attitudes:** -24 to +24
  - **History:** -120 to +120
  - **Proficiency:** -24 to +24
  - **Use:** -50 to +50
- Took those values and calculated separate absolute value scores, so that a lower value means more “balanced” language dominance
  - **Overall:** 0 to 218
  - **Attitudes:** 0 to 24
  - **History:** 0 to 120
  - **Proficiency:** 0 to 24
  - **Use:** 0 to 50

BLP Descriptive Results



To compare easily across categories, normalized all scores from -1 (Spanish dominant) to +1 (English dominant)

BLP Descriptive Results

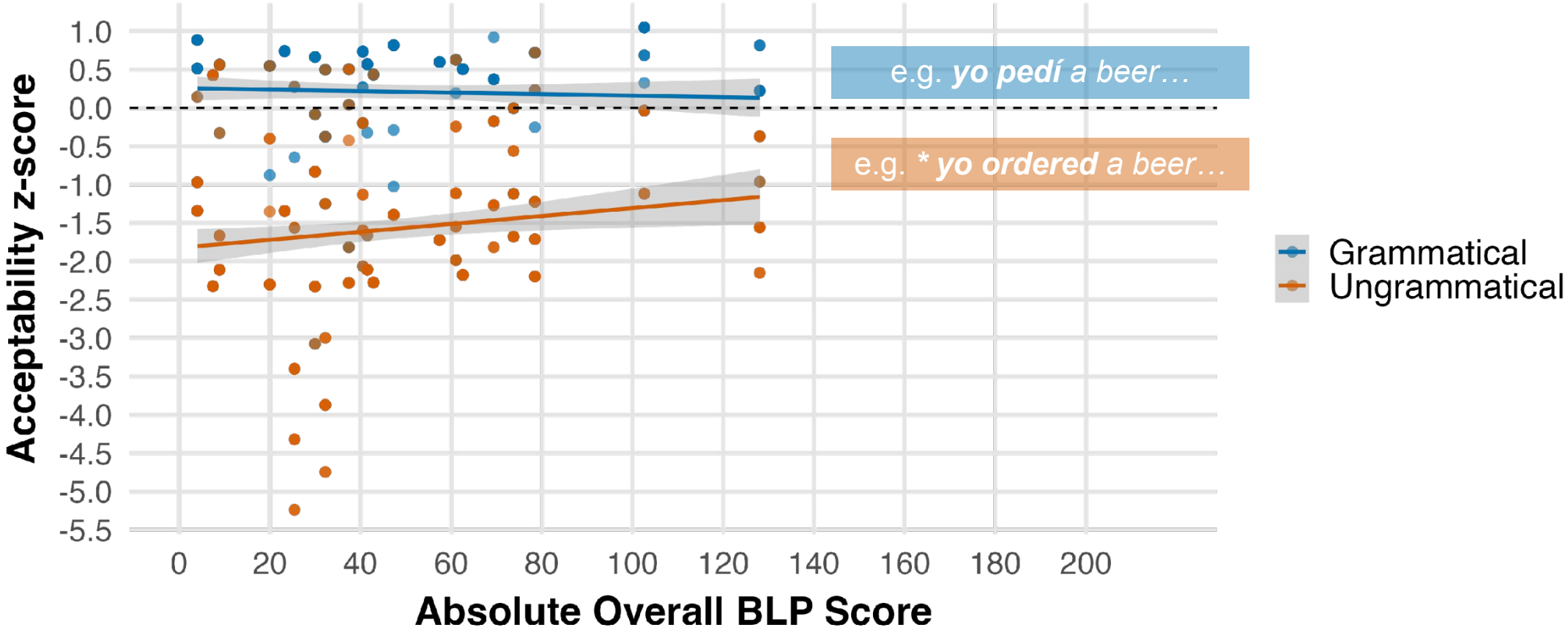


To compare easily across categories, normalized all scores from 0 ("balanced") to +1 (completely dominant in one language)

Data Pre-processing

- Converted acceptability ratings into z-scores
  - Standardizes ratings for cross-participant comparability, as it reduces individual biases regarding the use of the scale (Schütze & Sprouse, 2014)
- Two step process:
  - First, calculated the **average judgment rating (μ)** and **standard deviation (σ)** across all stimuli for each participant
  - Next, each **individual rating (x)** was converted using the formula: $\mathbf{z = (x – \mu) / \sigma}$
- Positive z-score indicates more acceptability compared to the other stimuli, whereas a negative one indicates more unacceptability

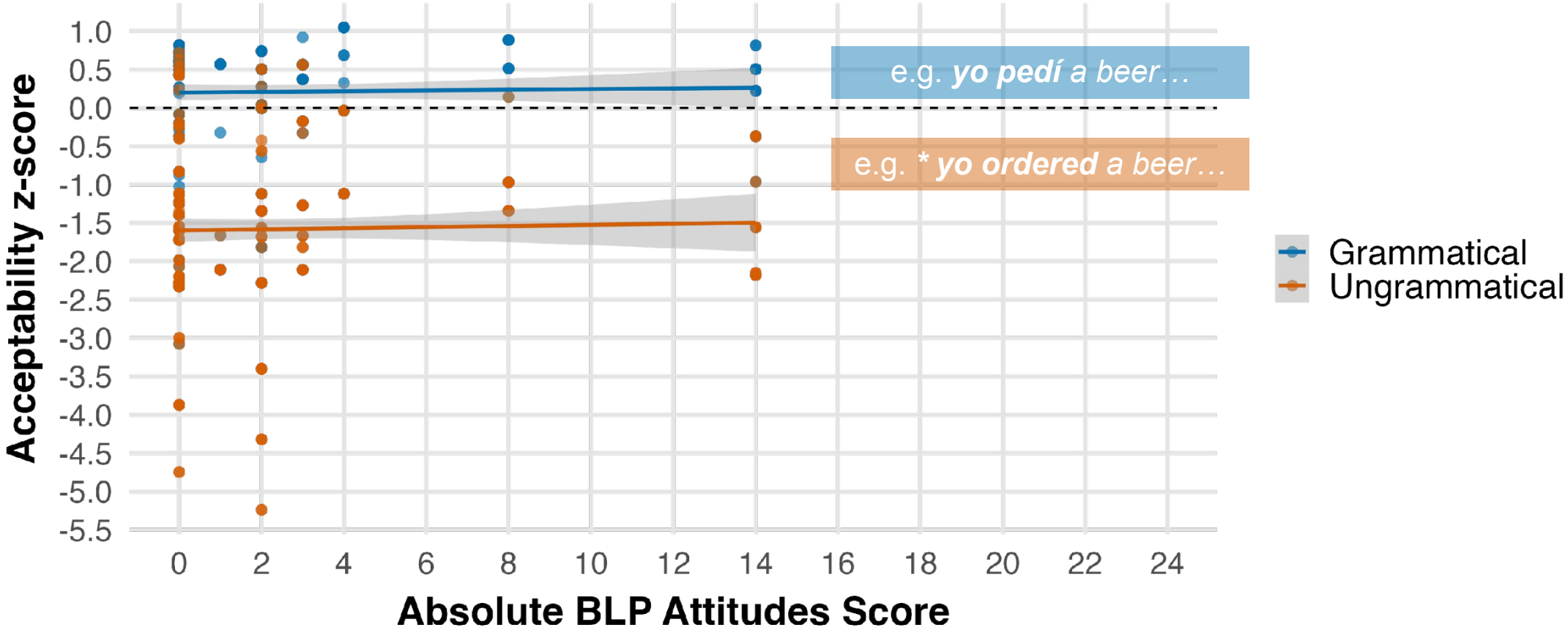
Overall Language Dominance



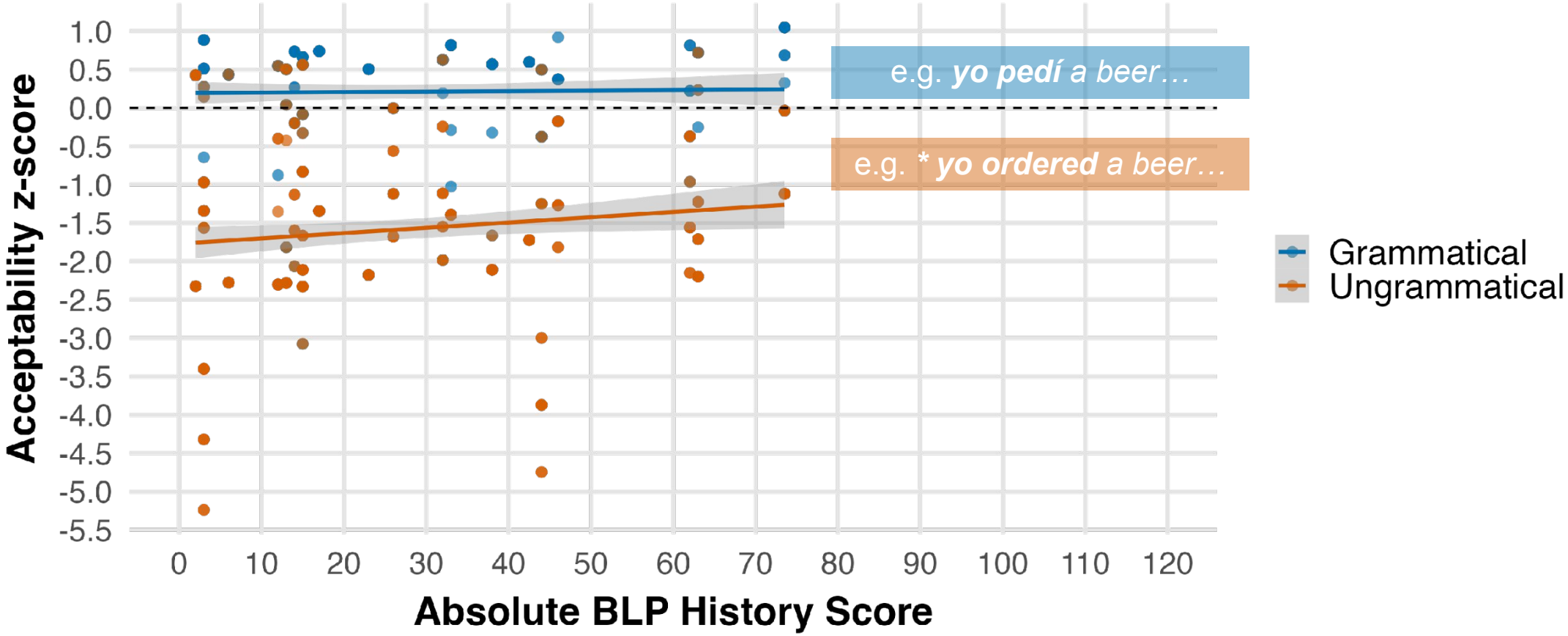
Linear Mixed Effects Models (LMM)

- LMMs were fitted to test the fixed effects on acceptability ratings
  - *Model 1:* **condition * switch direction**
  - *Model 2:* **condition * switch direction * absolute BLP score**
  - Both included random intercepts for participant and item
- Compared using an ANOVA to evaluate model fit
  - Significant effect of condition on z-scores in that the ungrammatical stimuli were rated lower, while switch direction showed no significant effects
  - Model 1 was preferred, as adding the BLP measure of **overall language dominance did not significantly** improve the model's explanatory power (p = .09)
- Summary: No effect for overall (absolute) language dominance
  - Participants were not more or less likely to differentiate between grammatical and ungrammatical switches based on being more "balanced" or not

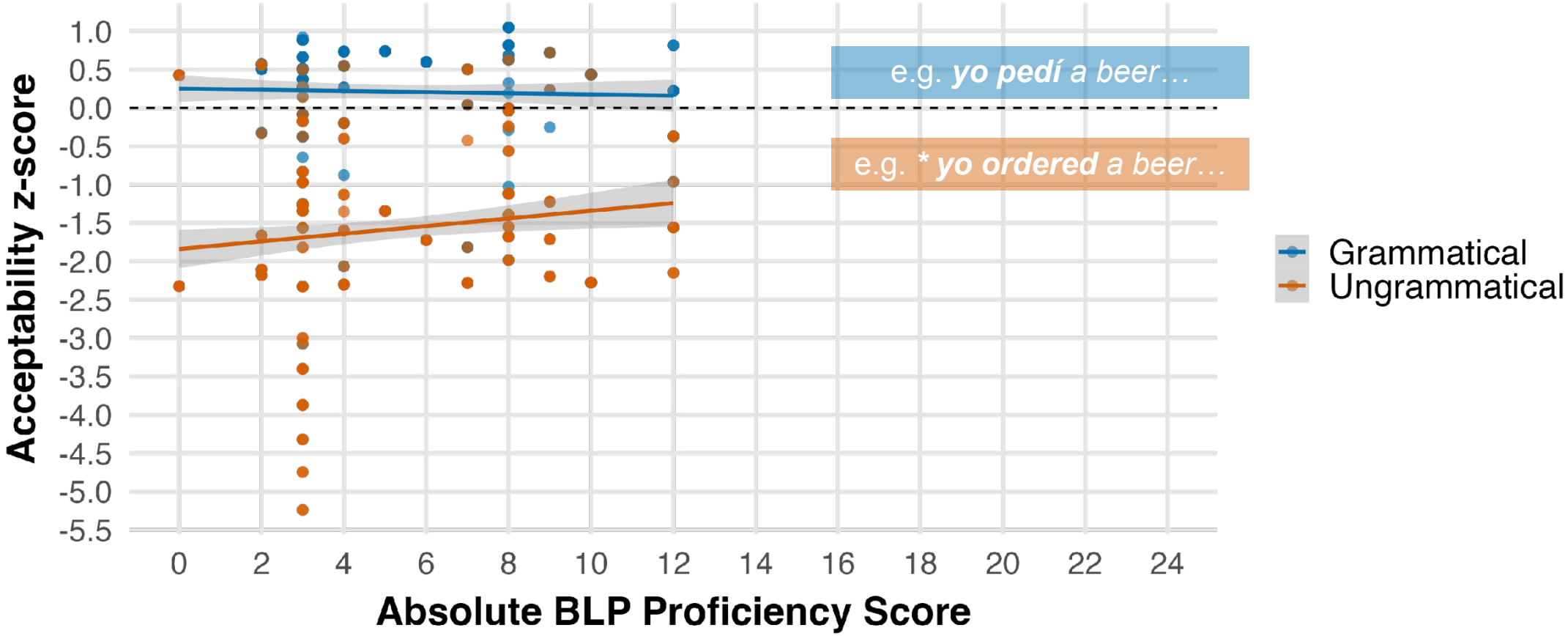
Language Attitudes



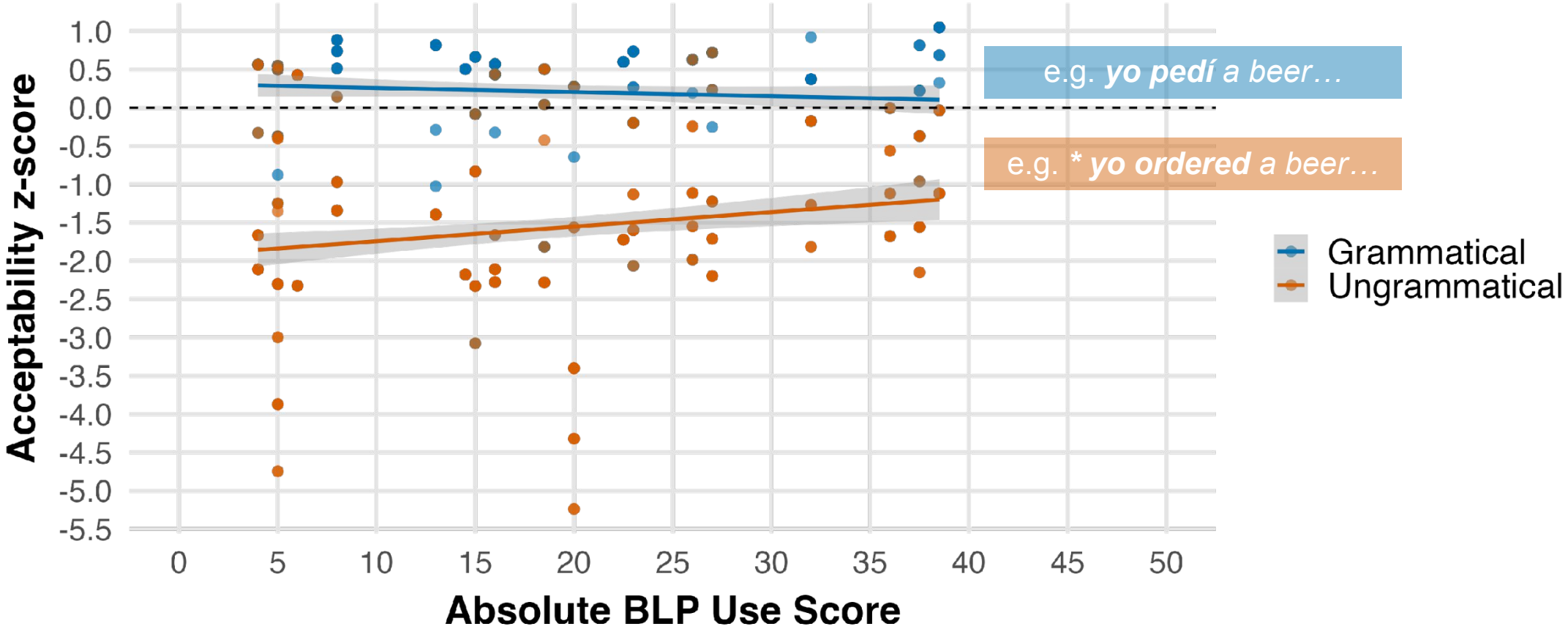
Language History



Language Proficiency



Language Use



Follow-up LMMs

- Parallel LMMs were fitted to test more fixed effects on acceptability ratings
  - *Model 1:* **condition * switch direction**
  - *Model 3:* **condition * switch direction * absolute BLP attitudes score**
  - *Model 4:* **condition * switch direction * absolute BLP history score**
  - *Model 5:* **condition * switch direction * absolute BLP proficiency score**
  - *Model 6:* **condition * switch direction * absolute BLP use score**
  - All included random intercepts for participant and item

Follow-up LMMs

- Compared each BLP-component score model to the original model (with no measure of language dominance) using an ANOVA to evaluate fit
  - Model 1 was preferred compared to Models 3 and 4, as BLP measures of **attitudes** and **history** did **not significantly** improve the model's explanatory power ($p > .05$)
  - However, Models 5 and 6 were preferred compared to Model 1, as BLP measures of **proficiency** and **use** **did** **significantly** improve the explanatory power ($p < .05$)
  - As a follow up, Model 6 was preferred to Model 5 ($p = .02$), as was it compared to an additional, more complex Model 7 that included *both* use and proficiency
- Summary: Effects for some components of (absolute) language dominance
  - Participants more likely to differentiate between grammatical and ungrammatical switches based on being more "balanced", but only with regard to their self-reported proficiency and use (with the latter being more influential)

RQs and Hypotheses

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- Two possible outcomes:
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Discussion

- Lack of a significant effect for **overall language dominance** suggests that for these early bilinguals, the differentiation of grammatical and ungrammatical switches is not broadly tied to being “balanced”
  - Even the bilinguals who were more dominant in one language (usually English) showed the same expected distinction in structural constraints on CS
- However, self-reported **proficiency** and language **use** were significant predictors regarding structure acceptability
  - Having comparable linguistic abilities and comparable amounts of usage leads to more consistency regarding the structural constraints’ acceptability
  - Importantly, though, all participants still rated the grammatical items lower, but the difference was that it was just to different degrees

Discussion

- Are the significant effects an artifact of language dominance rather simply due to the nature of bilingual proficiency and bilingual language use?
- Being considered “balanced” means quite different things depending on which subcomponent you are looking at
- Only certain combinations are possible for certain subcomponents
  - For example, for **attitudes**, you can have “balanced” bilinguals who are equally positive towards both language, as well as “balanced” bilinguals who are equally negative towards both
  - But for **proficiency**, if they are “balanced” it almost certainly entails that they are highly proficient in both, because it is unlikely to find someone with equally low proficiency in the two languages
  - The same holds for language **use**, as “balanced” can only mean close to 50/50, as the responses on the BLP for this category are explicitly relative (i.e., must equal 100)

Discussion

- Findings are is in line with previous research that has consistently tied dense CS to highly proficient bilinguals
  - “Switch types … which occur within a single sentence, are the ones which require the most skill” (Poplack, 1980, p. 615-616)
- More balanced use of the two languages may be tied to more frequent and varied exposure to CS
  - In line with the research targeting the importance of community-specific norms in CS patterns (Balam et al., 2020; Beatty-Martínez et al., 2020; among others)

Limitations

- Only looks at one type of bilingual, in one region, with one language pair
  - More variability in these regards would help know how generalizable the findings are
  - Of particular value would be populations that would score at the extreme ends of the BLP scale
- This particular population (i.e., heritage speakers of Spanish in the US) skews English-dominant
  - Data from Spanish-dominant immigrants in the US (from the same community) could help with a more balanced distribution of dominance scores in both directions
- Can and/or should we disentangle broader language dominance from the factors that feed into it?

Conclusion

- Did not find evidence to suggest that overall balance in language dominance impacts acceptability ratings of CS
  - Suggests early bilinguals can and do differentiate grammatical and ungrammatical switches regardless of being more or less “balanced”
- Further evidence connecting CS restrictions to higher bilingual proficiency and balanced use
  - Highlights the value of exposure for nuanced structural differentiation

¡Gracias!

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