Modality in Code-switching Research:
Evidence from Spanish/English Acceptability Judgment Tasks

BILINGUALISM RESEARCH LABORATORY

Bryan Koronkiewicz
bjkoronkiewicz@ua.edu
University of Alabama

Shane Ebert
sebert2@uic.edu
University of Illinois at Chicago

Introduction

There are various methodological concerns specific to code-switching (CS) research (cf. MacSwan & McAlister, 2010; González-Vilbazo et al., 2013)
- Modality of experimental stimuli yet to be fully investigated

Some factors seem to disfavor written CS
- CS is primarily a spoken phenomenon (Grosjean, 1982; Montes-Alcalá, 2001; Mahootian, 2005)
- CS can be influenced by prosodic and phonological factors (MacSwan, 1999; Toribio, 2001; Gardner-Chloros & Edwards, 2004; González-Vilbazo, 2005)

It is crucial to determine if written stimuli are unable to produce the same results as aural stimuli due to these potential issues

Current study investigates modality in Spanish/English CS with two different syntactic phenomena:
- Pronouns and lexical Determiner Phrases (DPs)
- Wh-questions

Specifics of these phenomena as they relate to CS are not relevant here, but for full analysis of the syntactic results related to these stimuli see Koronkiewicz (2014) and Ebert (2014) respectively

Research Question: Does CS stimuli modality have an effect on the results of an acceptability judgment task?
A: Does modality have an effect on numerical ratings?
B: Does modality have an effect on compared acceptability?

Although some factors disfavor the use of written CS stimuli, it is uncertain how this would affect the results specifically

Hypothesis (null): Modality has no effect on the results
A: Modality has no effect on the numerical ratings
B: Modality has no effect on the compared acceptability

Methodology

Participants

US Spanish/English bilingual speakers in Chicago
- Started acquiring both languages by a young age (≤ 6)
- Use both languages regularly and maintained proficiency
- Self-reported code-switchers
- Two groups: written (N = 19), aural (N = 18)

Experimental Procedure

Completed entirely online (via Ibex)
- Background questionnaire
- Task training and practice
- Acceptability judgment task (1-to-7 Likert scale)
- Proficiency assessment in both languages

Experimental Stimuli

Code-switched sentences (N = 128)
- Pronouns vs. lexical DPs (1-2)
- Wh-questions: matrix simplex (3-4), matrix complex (5-6), embedded simplex (7-8), embedded complex (9-10)
  - Subtypes vary with respect to the language of Tense (T) and word order (VS, V2, SV)

(1) a. **Él** *sleeps during the day*.
b. ***He*** duerme durante el día.

(2) a. **Ese hombre** *sleeps during the day*.
b. ***That guy*** duerme durante el día.

(3) a. Qué ***have stolen your neighbors*** mientras no estabas?
b. Qué ***have your neighbors stolen*** mientras no estabas?
c. Qué ***your neighbors have stolen*** mientras no estabas?

(4) a. *What* **han robado tus vecinos** *while you weren't there*?
b. *What* **han tus vecinos robado** *while you weren't there*?
c. *What* **tus vecinos han robado** *while you weren't there*?

(5) a. Cuántas blusas ***have bought your nieces*** este otoño?
b. Cuántas blusas ***have your nieces bought*** este otoño?
c. Cuántas blusas ***your nieces have bought*** este otoño?

(6) a. *How many blouses* **han comprado tus sobrinas** *this fall*?
b. *How many blouses* **han tus sobrinas comprado** *this fall*?
c. *How many blouses* **tus sobrinas han comprado** *this fall*?

(7) a. No recuerdo qué ***have bought your colleagues*** esta semana.
b. No recuerdo qué ***your colleagues have bought*** esta semana.

(8) a. *I don't remember what* **han comprado tus colegas** *this week*.
b. *I don't remember what* **tus colegas han comprado** *this week*.

(9) a. No recuerdo cuántas manzanas ***have eaten your children*** desde el domingo.
b. No recuerdo cuántas manzanas ***your children have eaten*** desde el domingo.

(10) a. *I don't remember how many apples* **han comido tus hijos** *since Sunday*.
b. *I don't remember how many apples* **tus hijos han comido** *since Sunday*.

Results

Two-way ANOVA to investigate effect on numerical ratings (RQ1)
- Main effect for Subtype (F = 102.054, p = .000)
- No main effect for Modality
- Interaction between Subtype*Modality (F = 3.334, p = .000)

Table 1. Mean average ratings for each subtype by modality

Subtype	Written		Aural		Change
	M	*SD*	*M*	*SD*	
Pronouns and lexical DPs					
Pronoun	2.99	2.54	2.96	2.46	– 0.03
Lexical DP	5.70	2.21	6.76	0.81	+ 1.06**
Matrix simplex wh-questions					
Eng T + VS	2.08	2.12	1.12	0.46	– 0.96 **
Eng T + V2	2.93	2.54	2.71	2.43	– 0.22
Eng T + SV	1.26	1.20	1.27	0.87	+ 0.01
Span T + VS	3.48	2.63	3.31	2.48	– 0.17
Span T + V2	2.64	2.45	2.10	1.85	– 0.54 **
Span T + SV	1.80	1.99	1.67	1.53	– 0.13
Matrix complex wh-questions					
Eng T + VS	2.10	2.12	1.74	1.37	– 0.36 **
Eng T + V2	5.89	2.03	5.18	2.32	– 0.71 *
Eng T + SV	3.12	2.63	2.76	2.19	– 0.36 **
Span T + VS	5.49	2.39	5.60	1.98	+ 0.11*
Span T + V2	3.68	2.76	3.69	2.53	+ 0.02*
Span T + SV	4.05	2.78	3.94	2.48	– 0.10 **
Embedded simplex wh-questions					
Eng T + VS	1.88	1.99	1.65	1.49	– 0.23 **
Eng T + SV	3.03	2.58	3.72	2.50	+ 0.69
Span T + VS	3.13	2.56	3.70	2.53	+ 0.58
Span T + SV	4.36	2.64	5.32	1.96	+ 0.96**
Embedded complex wh-questions					
Eng T + VS	2.15	2.09	2.22	1.92	+ 0.08
Eng T + SV	5.29	2.48	5.74	1.78	+ 0.45**
Span T + VS	4.96	2.57	5.21	2.19	+ 0.25**
Span T + SV	5.11	2.52	5.96	1.73	+ 0.85**

* significant at p < 0.05, ** significant at p < 0.01

Summary
- 7 subtypes show a significant increase (M = 0.53, SD = 0.43) aurally, 6 show a significant decrease (M = 0.53, SD = 0.27), and 9 show no significant difference
- Maximum change is about one point on the Likert scale

One-way ANOVA for each modality to investigate effect on compared acceptability of subtypes (RQ2)
- Significant difference between groups for both written (F = 39.644, p = .000) and aural mode (F = 71.952, p = .000)
- See Table 2 for post-hoc analysis of subtypes for each

Table 2. Significant differences between subtypes by modality

Subtype			Written	Aural
Pronouns and lexical DPs				
Lexical DP	>	Pronoun	.000	.000
Matrix simplex wh-questions				
Eng T + V2	**>**	**Eng T + VS**	**ns**	**.002**
Eng T + V2	>	Eng T + SV	.003	.007
Span T + VS	>	Eng T + VS	.032	.000
Span T + VS	>	Eng T + SV	.000	.000
Span T + VS	>	Span T + SV	.002	.001
Matrix complex wh-questions				
Eng T + V2	>	Eng T + VS	.000	.000
Eng T + V2	>	Eng T + SV	.000	.000
Eng T + V2	>	Span T + V2	.000	.002
Eng T + V2	>	Span T + SV	.000	.038
Span T + VS	>	Eng T + VS	.000	.000
Span T + VS	>	Eng T + SV	.000	.000
Span T + VS	>	Span T + SV	.019	.000
Span T + VS	>	Span T + V2	.000	.000
Span T + V2	>	Eng T + VS	.005	.000
Span T + SV	>	Eng T + VS	.000	.000
Embedded simplex wh-questions				
Eng T + SV	>	Eng T + VS	.004	.000
Span T + VS	>	Eng T + VS	.001	.000
Span T + SV	>	Eng T + SV	.000	.000
Span T + SV	>	Eng T + VS	.000	.000
Span T + SV	>	Span T + VS	.001	.000
Embedded complex wh-questions				
Eng T + SV	>	Eng T + VS	.000	.000
Span T + VS	>	Eng T + VS	.000	.000
Span T + SV	>	Eng T + VS	.000	.000

Summary
- 23 pairs of subtypes were found to be significantly different in written mode, whereas 24 pairs were found for aural mode
- Of the 85 different comparisons of subtypes, only one differs between the two modalities

Discussion

Hypothesis A is not confirmed: Modality can have an effect on numerical ratings
- There are varying differences between the modalities

Interestingly the differences are not unidirectional
- About a quarter of the subtypes tested show a significant decrease aurally and another quarter show an increase
- Means written does not just reduce ratings across the board
- Instead, when presented aurally, more acceptable subtypes tend to show an increase, whereas less acceptable subtypes tend to show a decrease

Additionally, these differences are minimal as the vast majority are under half a point; no subtype shows a drastic shift

Hypothesis B is (mostly) confirmed: Modality has little effect on compared acceptability
- The two modalities are almost exactly equivalent

For 98.8% of the subtype comparisons, the two modalities produce the same findings
- The one exception is for matrix simplex wh-questions: aural stimuli with an English T and V2 word order were found to be significantly more acceptable than those with an English T and VS word order

Conclusions

This study provides evidence that, yes, modality can affect the numerical ratings provided by bilingual participants

However, the effect is minimal and does not affect our understanding of the results in terms of acceptability
- There was only one difference between the two modalities, where aural mode produced one more significantly different pair of subtypes

Overall, this study suggests that modality is not a major concern to CS research
- Aural stimuli can amplify differences in numeral ratings
- However, in terms of compared acceptability, the same conclusions are reached for the two syntactic phenomena under investigation

Acknowledgments

Special thanks to: Genesis Rodríguez; Kim Potowski, Zuriñe Loftus and the UIC Spanish for Bilinguals Program; Inma Taboada and Kay González-Vilbazo; Bernard Issa; and the members of the UIC Bilingualism Research Laboratory

References

Ebert, S. (2014). The Morphosyntax of Wh-questions: Evidence from Spanish-English Code-switching. (Doctoral dissertation, University of Illinois at Chicago).

Gardner-Chloros, P., & Edwards, M. (2004). Assumptions behind grammatical approaches to code-Switching: When the blueprint is a red herring. *Transactions of the Philological Society, 102*(1), 103-129.

González-Vilbazo, K. (2005). Die Syntax des Code-Switching. (Doctoral dissertation, University of Cologne.)

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

Grosjean, F. (1982). *Life with Two Languages: An Introduction to Bilingualism.* Harvard University Press.

Koronkiewicz, B. (2014). Pronoun Categorization: Evidence from Spanish/English Code-switching. (Doctoral Dissertation, University of Illinois at Chicago).

MacSwan, J. (1999). *A Minimalist Approach to Intrasentential Code Switching.* Routledge.

MacSwan, J., & McAlister, K. T. (2010). Naturalistic and Elicited Data in Grammatical Studies of Codeswitching. *Studies in Hispanic & Lusophone Linguistics, 3*(2), 521-532.

Mahootian, S. (2005). Linguistic change and social meaning: Codeswitching in the media. *International Journal of Bilingualism, 9*(3-4), 361-375.

Montes-Alcalá, C. (2000). Written code-switching: Powerful bilingual images. In R. Jacobson (Ed.), *Code-switching worldwide 2* (pp. 59-74). Berlin: Walter de Gruyter.

Toribio, A. J. (2001). Accessing bilingual code-switching competence. *International Journal of Bilingualism, 5*(4), 403-436.