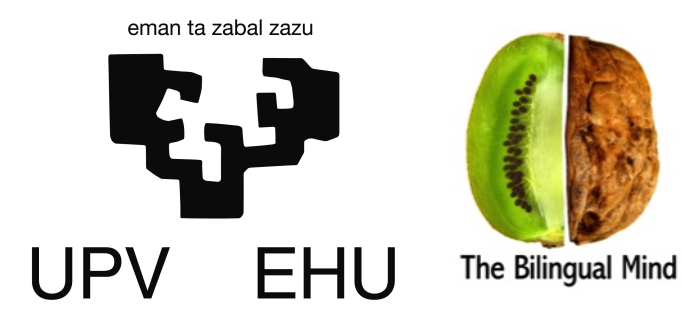


# On the impact of phrasal length on native and non-native sentence production: Evidence from Basque and Spanish



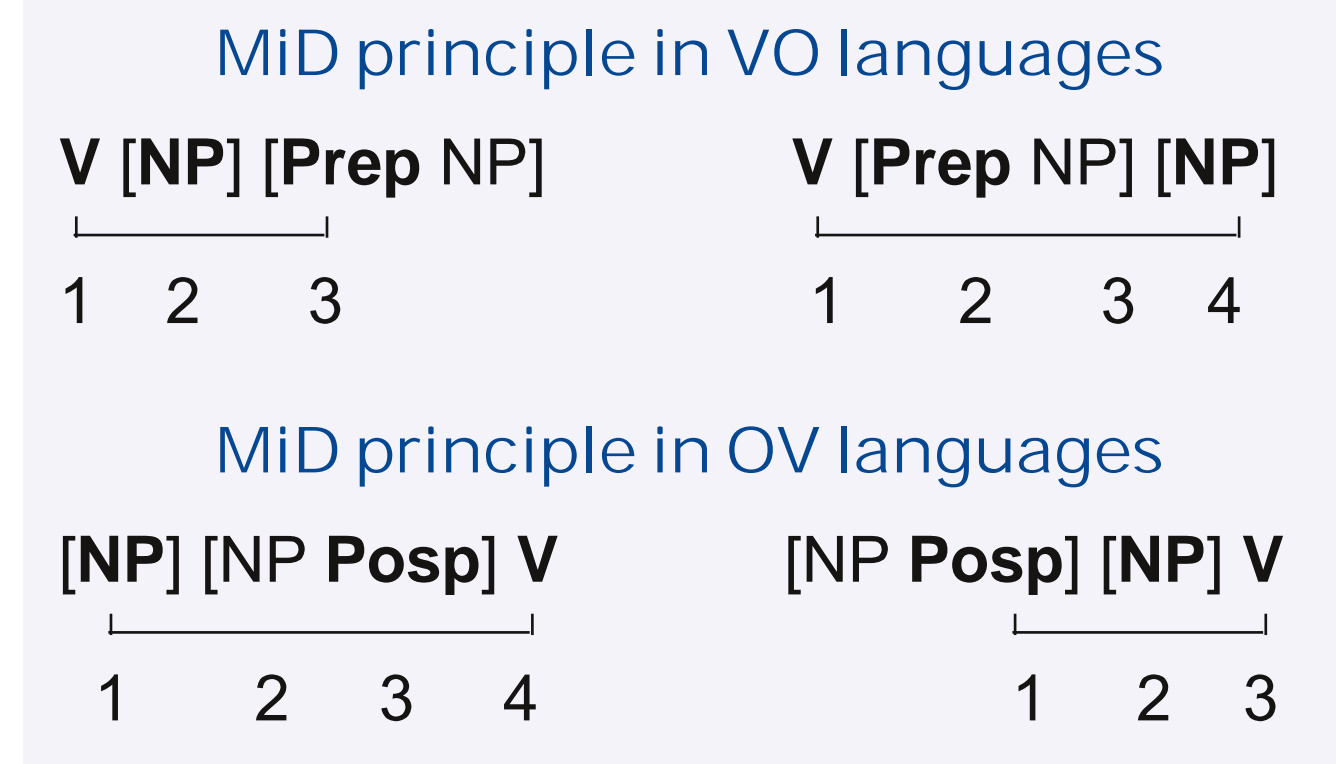
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## Introduction

A MIRROR-EFFECT OF LENGTH has been found in sentence word order preferences in VO (SHORT-BEFORE-LONG) and OV languages (LONG-BEFORE-SHORT) [1, 2, 3], contrary to the predictions of a universal short-before-long preference of availability-models [1]. Here we study word order preferences in Basque/Spanish and Spanish/Basque high-proficient bilinguals (Spanish: VO; Basque: OV) when using their native and non-native languages.

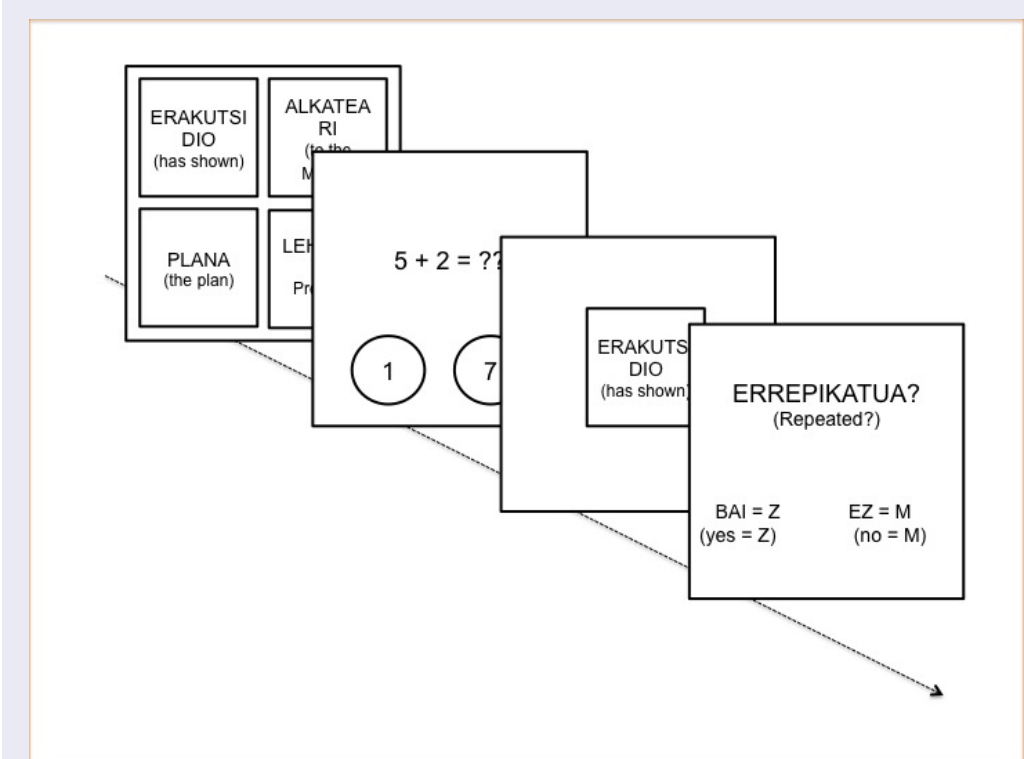
- ❖ Hawkins claims that the **SAME EFFICIENCY PRINCIPLE (MINIMIZE DOMAINS, MID)** yields opposing production patterns in both OV and VO languages [4]: NO PREDICTED DIFFERENCE AS A FUNCTION OF LENGTH BETWEEN NATIVE AND NON-NATIVE SPEAKERS.
- ❖ Connectionist models of language production suggest that **EXPOSURE TO LANGUAGE-SPECIFIC FEATURES** determines word order preferences [5]: a mirror-effect of length emerges from differences in the relative importance of surface structural information in VO and OV languages. Degree of exposure to L1 features that differ from L2 ones would be expected to affect L2 speakers' word order preferences [6, 7]: NON-NATIVE SPEAKERS SHOULD DIFFER FROM NATIVES IN HAVING WEAKER WORD ORDER PREFERENCES in relation to phrasal length because of their lower exposure to L1.
  - ⇒ Compatible with results from Korean (OV, long-before-short): English-Korean bilinguals did not show any effect of length [8], as they produced almost only SOV canonical order. This preference, though, might be due to a preference to produce easy-to-process canonical word orders [9, 10].



Does phrasal length differently modulate the strategies that Basque (OV) and Spanish (VO) native and non-native speakers employ in sentence word order production?

## MATERIALS & PROCEDURE

30 ditransitive sentences +  
24 transitive sentences +  
56 fillers



Cued recall production task +  
memory task  
Length of NPs was  
manipulated [2]

## Experiment 1: Basque

### All-Short

[Lehendakariak] [alkateari] [plana] [erakutsi dio]  
 President Mayor-to plan shown has  
 The President has shown the plan to the Mayor

### Long-IO

[Lehendakariak] [hiriaren babesa zeukan alkateari] [plana] [erakutsi dio]  
 President [city-of support had-that Mayor-to] plan shown has  
 The President has shown the plan to the Mayor [that had the support of the city]

### Long-DO

[Lehendakariak] [alkateari] [hiriaren babesa zeukan plana] [erakutsi dio]  
 President Mayor-to [city-of support had-that plan] shown has  
 The President has shown the plan [that had the support of the city] to the Mayor

**PARTICIPANTS:** 24 Basque native + 24 non-native speakers  
 (L1 = Spanish, VO, AoA: 2.04, formal settings)

	Language exposure	Proficiency
<b>Natives</b>	1.65 (.64)	6.69 (.49)
<b>Non-natives</b>	4.5 (1.4)	6.38 (.53)

7-point Likert scale: Exposure — 1: Only Basque; 7: Only Spanish  
 Proficiency — 7: Native-like; 1: I don't speak it

## Experiment 2: Spanish

### All-Short

[El Presidente] [mostrar] [el plan] [al alcalde]  
 The President show the plan to-the Mayor  
 The President has shown the plan to the Mayor

### Long-IO

[El Presidente] [mostrar] [el plan] [al alcalde que tenía el apoyo de la ciudadanía]  
 The President show the plan [to-the Mayor that had the support of the city]  
 The President has shown the plan to the Mayor [that had the support of the city]

### Long-DO

[El Presidente] [mostrar] [el plan que tenía el apoyo de la ciudadanía] [al alcalde]  
 The President show [the plan that had the support of the city] to-the Mayor  
 The President has shown the plan [that had the support of the city] to the Mayor

**PARTICIPANTS:** 18 Spanish native + 18 non-native speakers  
 (L1 = Basque, OV, AoA: 5.4, informal settings)

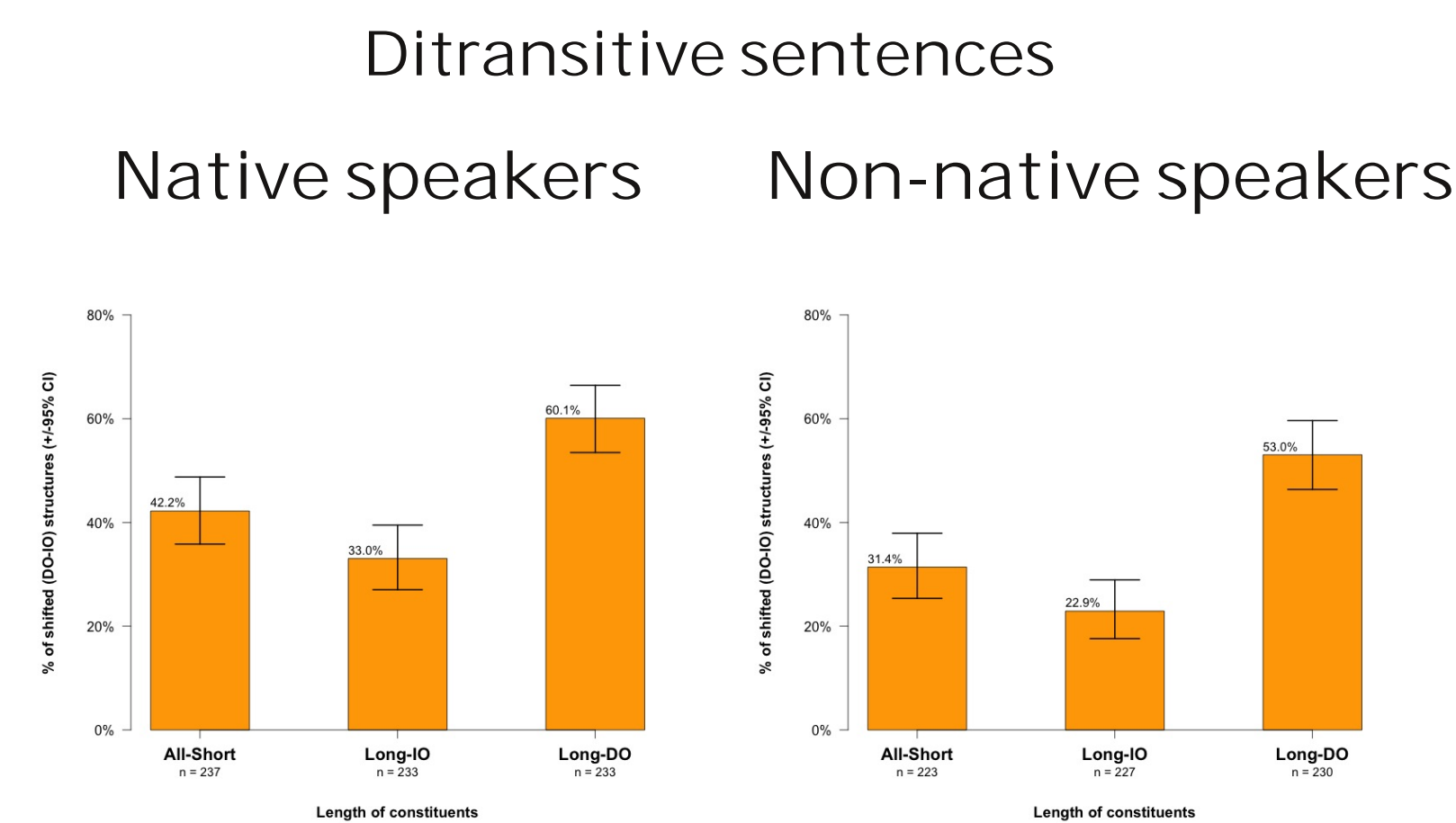
	Language exposure	Proficiency
<b>Natives</b>	5.19 (1.42)	6.75 (.33)
<b>Non-natives</b>	2.02 (.98)	5.53 (.97)

7-point Likert scale: Exposure — 1: Only Basque; 7: Only Spanish  
 Proficiency — 7: Native-like; 1: I don't speak it

## Results

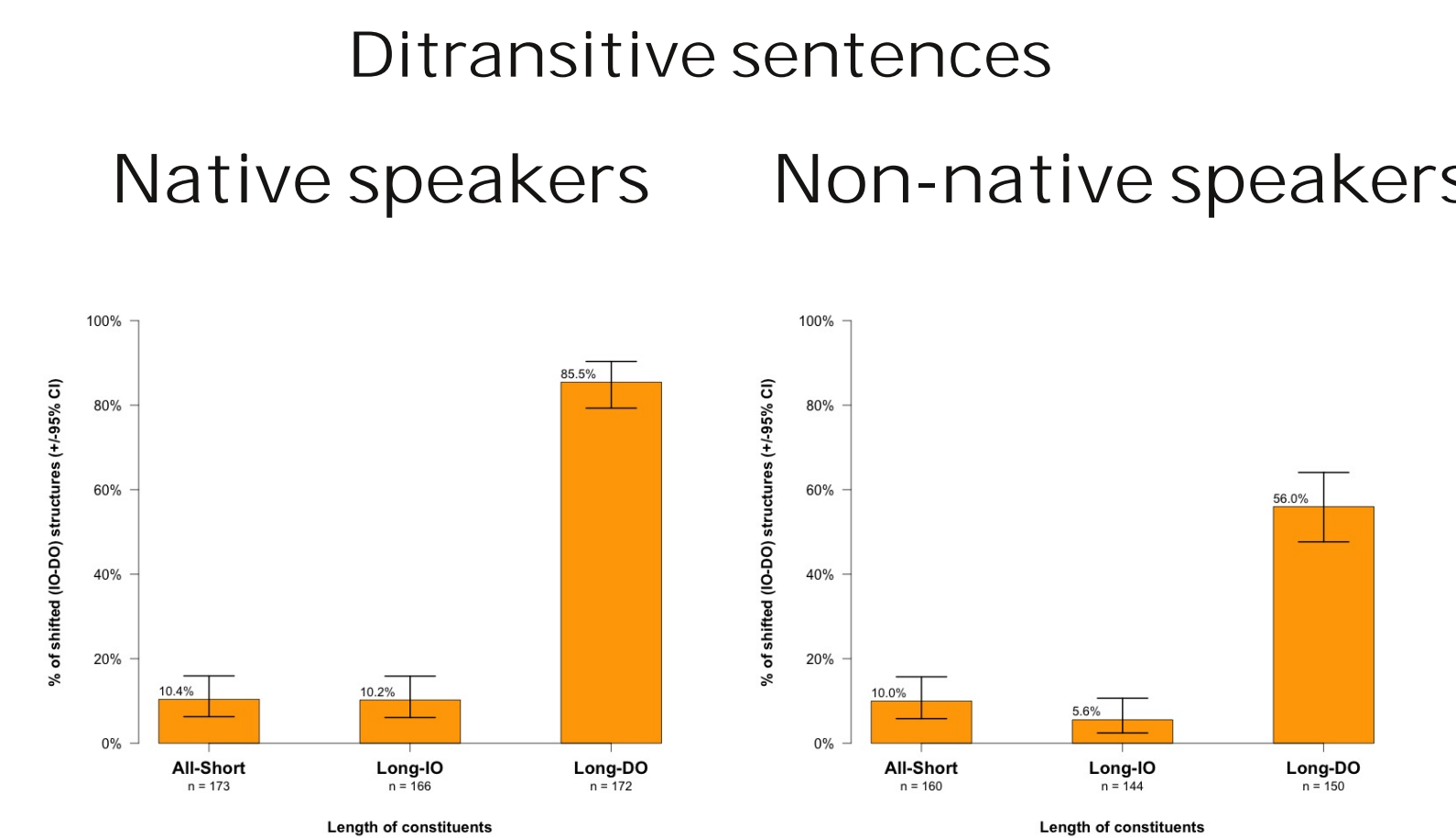
**BASQUE:** Percentage of shifted long-before-short (DO-S; DO-IO) orders

**SPANISH:** Percentage of shifted short-before-long (IO-DO) orders



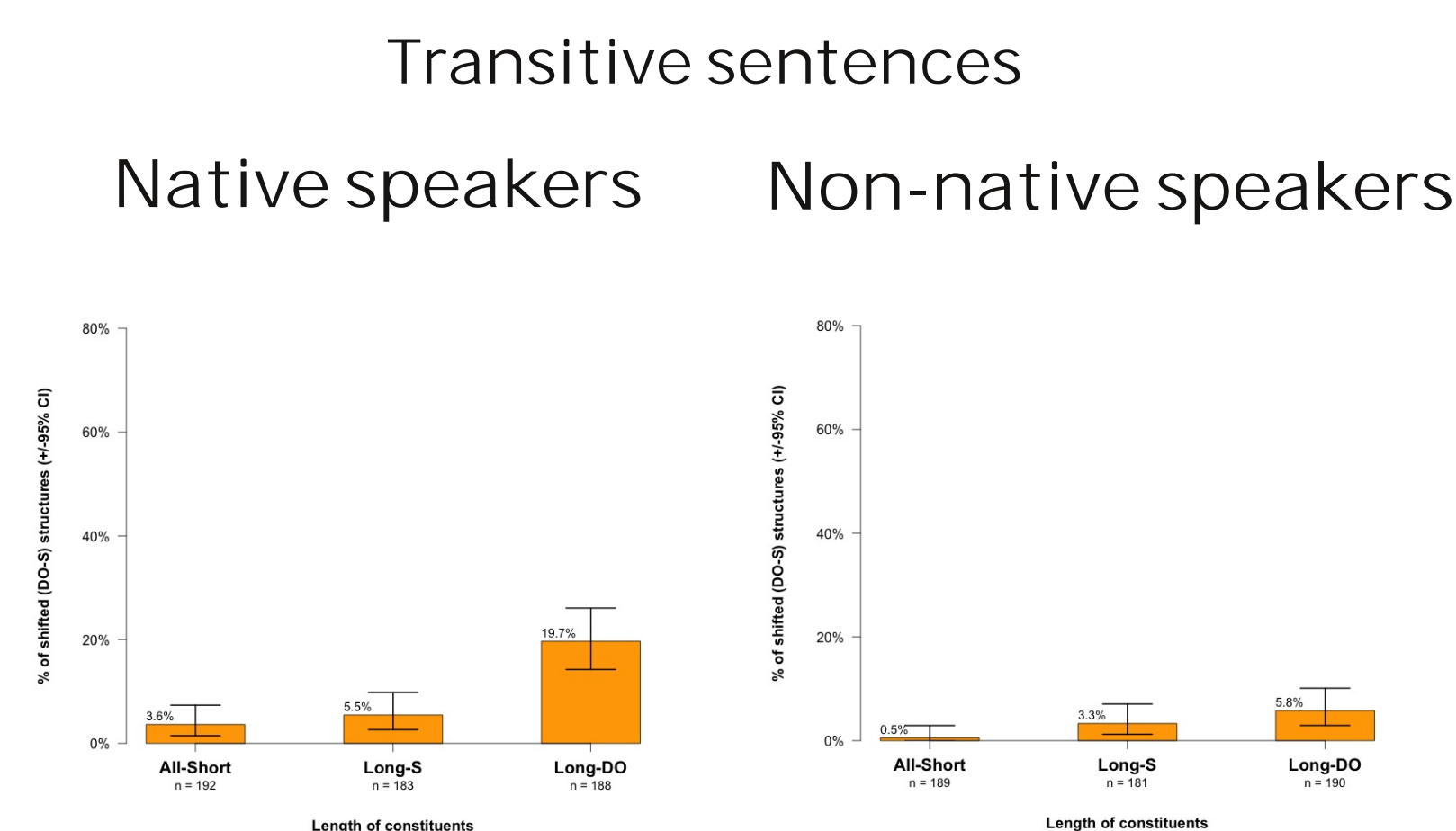
LOGIT MIXED MODEL ANALYSES:  
 \*IO-DO\* - 1 + Length + (1 | subject) + (1 | item)  
 \*IO-DO\* - 1 + Length\*Group + (1 | subject) + (1 | item)

- Tendency to place the long DO before the short constituents (S or IO) in both transitive (ps. < .02) and ditransitive (ps. < .006) sentences.
- Smaller (and less reliable) effect in transitive sentences.
- Similar effect of length in native and non-native speakers (no interaction lengthXgroup).



LOGIT MIXED MODEL ANALYSES:  
 \*IO-DO\* - 1 + Length\*Descr + (1 | subject) + (1 | item)  
 \*IO-DO\* - 1 + Length + (1 | subject) + (1 | item)  
 \*IO-DO\* - 1 + Length\*Group + (1 | subject) + (1 | Length | item)

- No effect in transitive sentences in a VO language (first time tested), unlike in OV languages [2, 3, 8].
- Tendency to place the long DO after the short constituents IO in ditransitive sentences (ps. < .001).
- Smaller effect of length in non-native speakers in ditransitive sentences (interaction lengthXgroup: p < .001)



LOGIT MIXED MODEL ANALYSES:  
 \*DO-S\* - 1 + Length + (1 | subject) + (1 | item)  
 \*DO-S\* - 1 + Length + (1 | Length | subject) + (1 | item)

- **MIRROR EFFECT OF LENGTH ON PHRASAL ORDER:** LONG-BEFORE SHORT in Basque (OV) vs. SHORT-BEFORE-LONG in Spanish (VO).
- **DIFFERENT DEGREE OF IMPACT OF LENGTH DEPENDING ON LANGUAGE** (Spanish > Basque) **AND TYPE OF SENTENCE** (ditransitives > transitives).
- **NO TRANSFER OF NON-NATIVE SPEAKERS' L1 PROCESSING STRATEGIES OR BASIC WORD ORDER.**
- **GREATER PREFERENCE FOR CANONICAL WORD ORDER IN NON-NATIVE SPEAKERS** compared to native speakers (ps. > .001 in all conditions in Basque transitive and ditransitive sentences and only in long-O in Spanish).

## Discussion

Our results are compatible with the predictions of Hawkins' Minimize Domains (MiD) principle, which yields opposite word order patterns in VO and OV languages: Native and non-native high-proficient speakers seem to employ the same strategy when producing sentences with long phrases.

- ❖ However, there was a **GREATER RELIANCE ON BASIC WORD ORDERS IN NON-NATIVE SPEAKERS** compared to native speakers. This cannot be due to the intrusion of L1 word order or L1-dependent processing strategies, but might be due to a PREFERENCE FOR SYNTACTIC SIMPLICITY (e.g., the basic word order is the computationally less demanding order [9, 10]). This expansion is consistent with the SOV preference in English-Korean bilinguals. Further evidence from less proficient bilinguals would be needed to strengthen our results.
- ❖ Other accounts (*Uniform Information Density* (UID), Competition Model) could account for the difference in shifting rate across languages [11, 12].
- ❖ Our results shed light to current debates on the nature of language production: speakers can initiate formulation from a structural representation whose scope is broader than a word. Further research needed to see what determines the interplay between word- and structure-driven sentence planning when differences in NPs' complexity are at play.

## Acknowledgments

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