Mixing Things Up
The role of blocking and mixing in the comprehension of CS sentences

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First, let's take a step back...

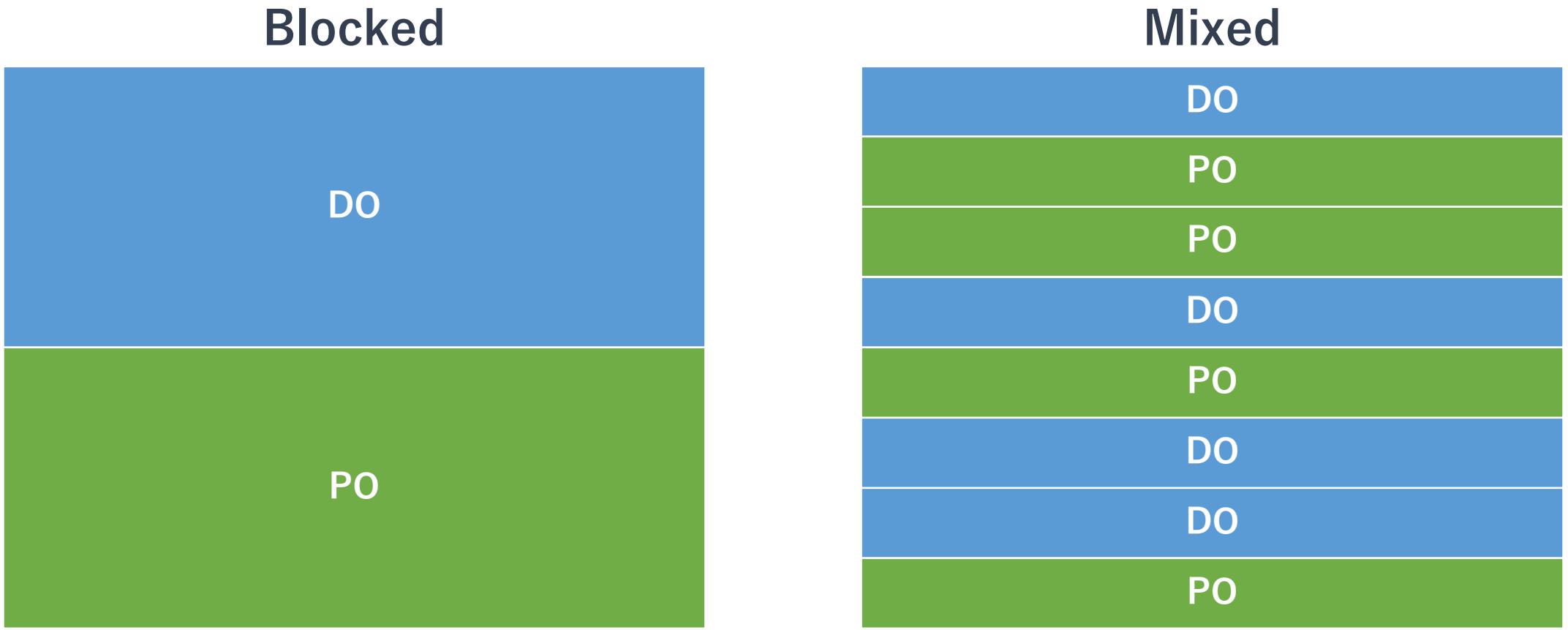
Mixing and Priming

Jaeger & Snider (2013)

- Looked at the priming of prepositional object (PO) and double object (DO) constructions in English.
  - How did prior and recent experience affect priming of these two constructions?
- Primes and targets were either blocked by construction, or mixed.

Mixing and Priming

Jaeger & Snider (2013)



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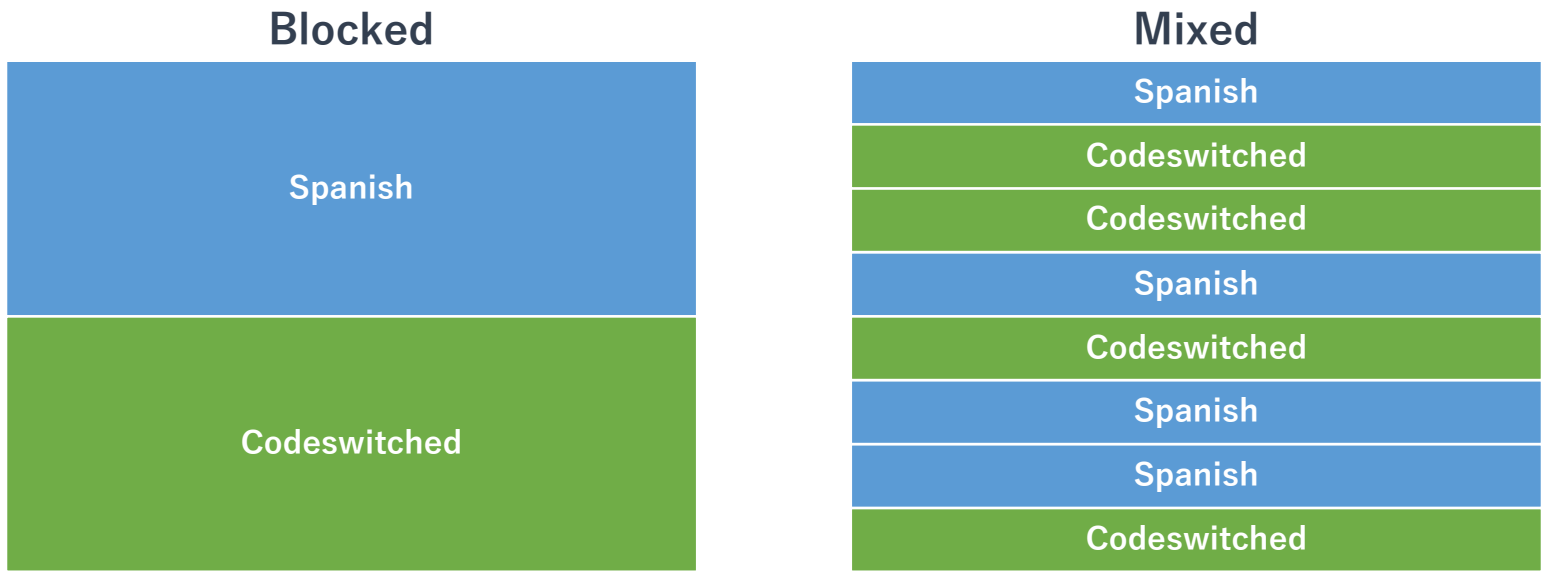
Mixing and Priming

Jaeger & Snider (2013)

- In the mixed block, the priming effect for PO constructions increased as exposure increased.
  - The more exposure, the stronger the priming effect.
- Over the course of a single experiment, strategies can change.

Mixing and Codeswitching

What are the implications for lab-based studies of codeswitching?



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Research Questions and Hypotheses

- Does mixing incur greater overall processing difficulty compared to a blocked design?
  - H1: Yes, mixing should result in a greater switch effect at the noun compared to a blocked context.
  - H2: Differences between *el*-switches and *la*-switches will be masked in the mixed block.
- Does codeswitching experience modulate switch effects?
  - H3: Yes, bilinguals with codeswitching experience should show reduced switch effects overall compared to their non-codeswitching counterparts.
  - H4: Bilinguals without codeswitching experience will show modulation of these effects based on language dominance.

Stimuli

Masculine Target Noun	Feminine Target Noun
La criada encontró el **jabón** en el gabinete.	El profesor tomó la **cerveza** en el bar anoche.
La criada encontró el **soap** en el gabinete.	El profesor tomó la **beer** en el bar anoche.
'the maid found the soup in the cabinet'	'the professor drank the beer in the bar last night'

- 84 Spanish nouns plus their English translation equivalents.
  - Matched across language for frequency.
- Looked at switch effects in the determiner phrase across blocked and mixed contexts.

Procedure

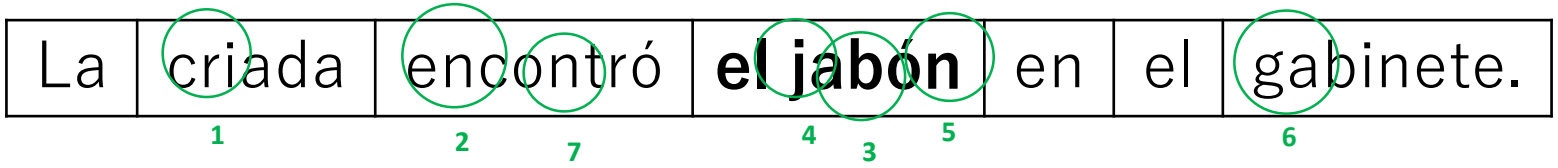
- Eye-tracking, sentence reading with comprehension questions.
  - Reading reflects bilingual language production. (Guzzardo Tamargo, Valdés Kroff, & Dussias 2016).
- Completed a language history questionnaire.
- Three blocks of 84 sentences each (28 experimental, 56 filler).
  - Spanish-only
  - Codeswitch-only
  - Mixed (50/50)

Participants

- Three groups:
  - L1 English, L2 Spanish (n = 4)
  - L1 Spanish, L2 English (n = 4)
  - Heritage Speakers (n = 8)
- Collected measures of language proficiency and cognitive control.
- A small number of participants necessarily makes our results preliminary.

Data Analysis

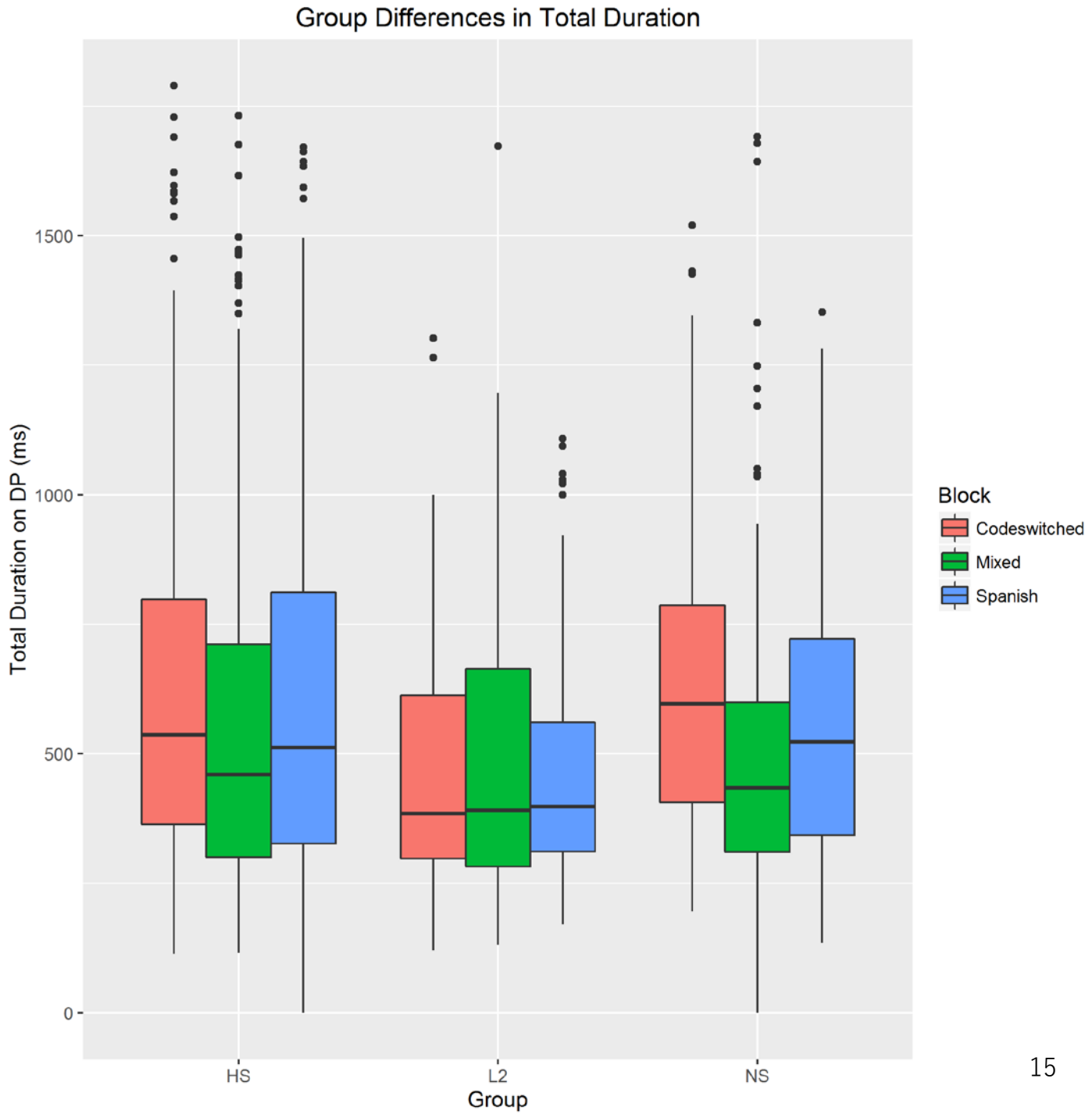
- Eye-tracking measure: Total Duration
  - The sum of all fixation durations in the critical region.
  - Longer fixations reflect increased processing time.



- Analyzed the determiner and noun as one interest area. (Guzzardo Tamargo et al., 2016)
- Conducted linear mixed-effects models in R using the lme4 package. (Bates et al., 2015)

Preliminary Results

Block:
T = -1.862



Preliminary Results

Summary

- Mixed block may result in shorter durations, especially for HS, but more data is needed to see if this holds.
- Language dominance seems to be more important for the L1 Spanish bilinguals; no differences for L1 English bilinguals.
- Switch effects (codeswitch vs. unilingual) do not seem to be affected by context (block or mixed).

Returning to our Hypotheses

- H1: Mixing should result in a greater switch effect at the noun compared to a blocked context.
  - No evidence that mixing results in a greater switch effect.
  - Mixing may actually *reduce* durations for HS.
- H2: Differences between */e/*-switches and */a/*-switches will be masked in the mixed block.
  - Yes, but they were also not present in the blocked context.

Returning to our Hypotheses

- H3: Yes, bilinguals with codeswitching experience should show reduced switch effects overall compared to their non-codeswitching counterparts.
  - No switch effects found for any group.
- H4: Bilinguals without codeswitching experience will show modulation of these effects based on language dominance.
  - Possibly the case more globally, but not for switch effects.

Blocking and Mixing: Different?

Possibly the case, but uncertain at this point: more data is needed.

Nonetheless, we may still ask how (if) blocking and mixing reflect production.

Inter-Sentential Switch Costs

Gullifer, Kroll, and Dussias (2013)

- Compared word naming in English and Spanish in a mixed and a blocked context.
  - Mixed block resembled inter-sentential codeswitching.
- Found a cognate facilitation effect in both the mixed and blocked contexts, with no reliable effects of mixing on naming times.
  - "…language switching does not incur a cost so long as there is sufficient linguistic context (i.e., a sentence context) available." (11)

Looking to Corpus Data

Guzzardo Tamargo, Valdés Kroff, & Dussias (2016)

- Bilinguals tend to produce localized codeswitches, that tend to be surrounded by unilingual stretches of discourse.
- Codeswitches do not occur in rapid succession, nor is switching particularly frequent.
- This does not reflect a mixed design, where switching occurs frequently and consistently.

Reflecting CS Practices in the Lab

- Lab-based studies of codeswitching focus on tight control.
- In fact, mixing may be *closer* to what we see in corpora, where switches aren't as frequent as they are in a blocked context.

Where to Go Next?

- Embedding codeswitches in short stretches of discourse.
  (Beatty-Martinez & Dussias, *in prep*)
  - Provides a context for the switch.
- Taking this discourse from natural production.
  (Halberstadt, *in prep*)
- By bringing social dimensions into the lab, we can refine how we study codeswitching, bringing new tools to bare on our research.

¡Mil gracias!

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