Shared syntax in heritage speakers: Does code-switching affect the strength of cross-language structural priming?

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After hearing a grammatical structure in one language, bilinguals become more likely to produce that same structure in their other language (Hartsuiker et al. 2004, and Van Gompel & Arai 2018). However, heritage speakers and other bilinguals mix languages in a way that does not follow the script of experiments investigating this *cross-language structural priming* phenomenon (Kootstra & Rossi 2017). They not only switch languages *between* but also *within* sentences. Before conducting an experiment with heritage speakers of Spanish in the US, we test the hypothesis that, under an implicit learning account of structural priming (Chang et al. 2006), code-switching in the prime increases syntax sharing, leading to a stronger cross-language priming effect compared to single language prime sentences.

We report on four of six preregistered simulated experiments (https://aspredicted.org/blind.php?x=FZF_XRH) using the Bilingual Dual-path model (Tsoukala et al. 2021), which was previously used to simulate both code-switching (Tsoukala et al. 2021) and cross-language structural priming (Khoe et al. 2023). Following Khoe (2023), we trained model instances on artificial versions of Spanish and English, to be used as simulated participants. These simulated participants received more English than Spanish input to simulate the English-dominant heritage speakers we will recruit as participants. Simulated participants were presented with Spanish transitive primes before producing English sentences. The primes either had an English (code-switched) determiner and noun (Table 1:a,b) or noun only (c,d), or were entirely in Spanish. Code-switches were at the beginning (a,c) or the end of sentences (b,d). With a code-switched determiner and noun at the beginning, there was increased structural priming compared to entirely Spanish primes (Fig. 1), whereas code-switching seemed to lead to weaker priming in the other simulations. Mixed effects analyses revealed a significant positive interaction between code-switch condition and priming (Est. = 0.06, p = .022) for the former simulation (a), but non-significant negative interactions otherwise: priming in the model is stronger with a code-switched English noun phrase at the very beginning of the sentence, but not with a code-switch later on. These results support the idea that code-switching and cross-language structural priming can be interpreted as evidence for shared syntax in a bilingual's language system ((Hartsuiker et al. 2004, Kootstra et al. 2010 and Goldrick et al. 2016).

Table 1. Examples

(a)	"***the boy*** empuja el juguete"	Code-switched determiner and noun at beginning of sentence
(b)	"el niño empuja ***the toy***"	Code-switched determiner and noun at end of sentence
(c)	"el ***boy*** empuja el juguete"	Code-switched noun at beginning of sentence
(d)	"el niño empuja el ***toy***"	Code-switched noun at end of sentence

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