

Does bilingual inhibitory control operate over structural representations?

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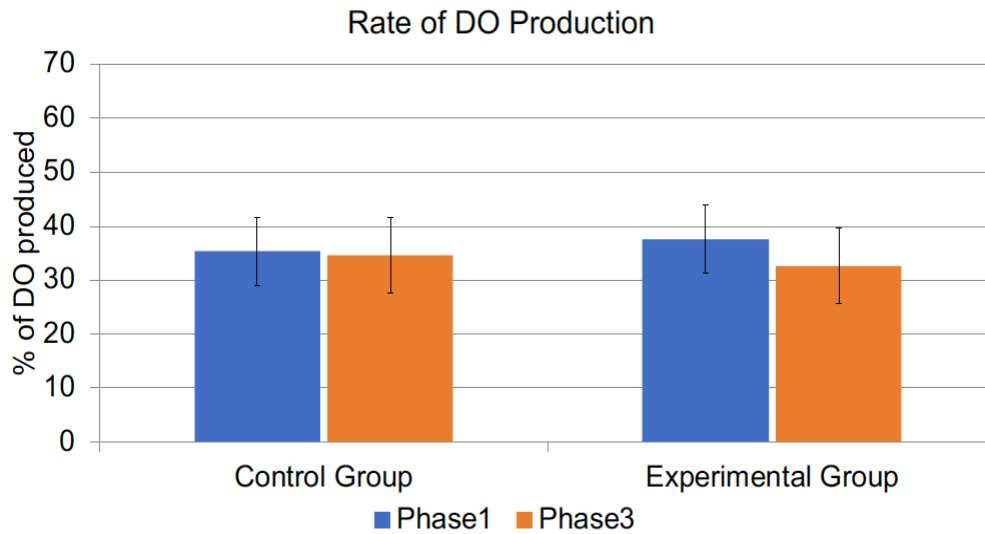
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Bilinguals rarely make wrong-language intrusions when their other language would not be understood. In the widely accepted Inhibitory Control Model, this is because they inhibit the non-target language to avoid interference (Green, 1998). Such inhibition can happen at two levels: *local inhibition*, when language task schemas (e.g., “Production in Language X”) inhibit outputs of the lexico-semantic system belonging to the non-target language, and *global inhibition*, when they inhibit whole non-target-language schemas (e.g., “Production in Language Y”). But the model does not specify if syntactic representations also get inhibited. It may be that they do not, and inhibition operates only over lexical representations. It may also be that syntactic representations are inhibited too, although how such inhibition would operate depends on the architecture of the bilingual syntactic system. For example, the language task schema would not be able to send inhibition to all syntactic representations in a language if the syntactic system is shared across bilinguals’ languages (Hartsuiker et al., 2004) and instead may operate only over language-tagged non-shared representations. Establishing if inhibition operates at the structural level will thus help constrain both accounts of bilingual language control and of bilingual structural representation.

The existence of structural inhibition was tested in a picture-description experiment with Spanish-English bilinguals dominant in English. The study is based on the fact that a transfer event can be expressed with both a prepositional dative (e.g., *The nun is giving a book to the pirate*) and a double object sentence in English (e.g., *The nun is giving the pirate a book*), but only with a prepositional dative in Spanish since Spanish lacks the double object structure. We compared differences in bilinguals’ double-object production rates in English before and after speaking Spanish, to those of another group of bilinguals who spoke only English throughout.

The experiment was administered online using Qualtrics. In Phase 1, all bilinguals gave typed descriptions of a set of 24 dative pictures in English (containing six written verbs repeated across four pictures), and an intermixed set of 36 intransitive fillers. In Phase 2, an Experimental group described in Spanish a set of monotransitive pictures (e.g., a waitress eating a cake), half of which had animate and half inanimate objects. A Control group described the same monotransitive pictures in English. In Phase 3, all bilinguals described a different set of dative pictures using the same six verbs as in Phase 1 (mixed with another set of 36 fillers). If structures get inhibited, speaking Spanish in Phase 2 should induce global inhibition of English, affecting in the very least the English structures that are not shared with Spanish, among them double objects. If so, upon returning to English, double objects should have reduced accessibility because of the prior inhibition. The Experimental group should thus produce fewer double-objects in Phase 3 than in Phase 1, while for the Control group there should be no change. To ensure sufficiently high baseline double-object production, the experiment began with a phase priming double objects, and target verbs were the six verbs that elicited highest rates of double objects in prior norming with the same population. Bilinguals’ English and Spanish proficiency and language history was assessed with a language history questionnaire (summarized in Table 1).

Preliminary results (Figure 1) showed no significant effects. Of most interest, bilinguals in the Experimental group ($N = 29/48$) were not differentially affected by Phase type than participants in the Control group ($N = 33/48$; Phase type X Group interaction in the LMER model: $p = .57$). Thus, tentatively, so far we have failed to detect any evidence for global structural inhibition. Experiment 2 will further test for effects of local structural inhibition: It may be that the non-existent-in-Spanish double object structure needs to be inhibited especially or only during production of Spanish prepositional datives, but not during production of monotransitives, with which it does not compete. New in addition to repeated dative verbs in Phase 3 will further test if effects are lexically driven; if so, double object production should decrease in Phase 3 for the Experimental group only for repeated but not for new verbs.



*Error bars represent standard error.

Figure 1. Percentage of double object (DO) production for the Control and Experimental groups in Phases 1 and 3.

Table 1. Language history characteristics of bilinguals in the Control and Experimental groups. The groups did not differ on any characteristic (all $ps > .32$).

	Control Condition	Experimental Condition
Age of first exposure in years		
English	2.46 (3.39)	3.67 (4.37)
Spanish	0.64 (1.57)	1.41 (4.67)
Other language(s)	10.85 (5.74) N=13	15.25 (8.71) N=12
Age of Acquisition in years		
English	4.54 (4.15)	4.72 (4.72)
Spanish	3.66 (3.50)	2.87 (4.89)
Other language(s)	Not collected	Not collected
% daily use		
English	67.76% (22.70%)	63% (24.61%)
Spanish	32% (22%)	34% (24%)
Other language(s)	3% (7.43%) N=13	1% (3.11%) N=12
Self-rated proficiency		
English	9.5 (0.75)	9.19 (1.21)
Spanish	7.71 (2.42)	8.26 (2.25)
Other language(s)	2.23 (1.64) N=13	3.33 (2.57) N=12

Note: Standard deviations are provided in parentheses.

References:

- Green, D. W. (1998). Mental control of the bilingual lexico-semantic system. *Bilingualism: Language and Cognition*, 1(2), 67-81.
- Hartsuiker, R. J., Pickering, M. J., & Velkamp, E. (2004). Is syntax separate or shared between languages? Cross-linguistic syntactic priming in Spanish-English bilinguals. *Psychological Science*, 15(6), 409-414.