

How Do Construction Frequency Effects Modulate L2 Priming?

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1. Introduction

The role that the first language (L1) plays in second language (L2) acquisition and processing has long been one of the major questions in Second Language Acquisition (Corder, 1992; Ellis, 1985; Selinker, 1992). To what extent does the syntax of the L1 constrain language production in the L2? A novel way to approach this question is by examining structural priming, the phenomenon whereby speakers reuse a syntactic structure they have recently heard, read or self-produced (Bock, 1986). Structural priming is thus a situation in which prior language experience can influence subsequent language production.

A common finding in L1 structural priming studies is that priming effects are usually stronger the less frequent a construction is in a language. In other words, infrequent structures yield higher rates of priming. This is known as the inverse frequency effect (Jaeger & Snider, 2013). Despite being extensively attested in L1 structural priming, only a handful of studies have examined this effect in L2 structural priming, and mostly with advanced L2 speakers (e.g., Flett et al., 2013; Shin & Christianson, 2012). Results from these studies showed that the frequency of the L2 construction modulates the strength of structural priming rather than whether the construction is present or absent in the L1, or the frequency of the construction in the L1. However, studies of L1 transfer in L2 acquisition show that transfer effects are more prominent in beginning and intermediate levels of proficiency than in advanced levels (Schwartz & Sprouse, 1996). Therefore, examining whether the inverse frequency effect holds in less proficient L2 speakers and whether it is motivated by the speakers' L1, L2, or none of the languages is crucial to advance our knowledge of how L2 acquisition and, more specifically, of how L2 structural priming operates as a function of proficiency.

To investigate these questions, the present study explores structural priming effects in a group of intermediate Spanish L2 learners (L1 English). To examine the potential effect of construction frequency, two structures differing in their frequency rates are considered: Spanish verbal passives (*El libro fue leído por Ana*, 'The book was read by Ana') and Spanish clitic doubling constructions (*Antonio le dio una manzana a María*, 'Antonio gave Maria an apple').

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2. Structural priming

Structural priming consists of repeating a structure a speaker has been recently exposed to (Bock, 1986). It is effective with native speakers (Levelt & Kelter, 1982), L2 speakers (Jackson, 2018), and even linguistically-impaired individuals (Miller & Deevy, 2006). Likewise, it occurs with different syntactic constructions (Hartsuiker et al., 1999; Kaan & Chun, 2018), in the long-term (Jiang & Huang, 2015; Shin & Christianson, 2012), and in various modalities (Pickering & Branigan, 1998; Potter & Lombardi, 1998). Another important aspect of structural priming is that its effects can be tested in monolingual mode (within-language priming) or in bilingual mode (cross-linguistic priming). In within-language priming, the prime and the target constructions are in the same language. In cross-linguistic priming, on the other hand, the prime construction is presented in a language different from the one speakers must use to produce the target construction.

Two types of models have been proposed to explain the nature of structural priming. On the one hand, the activation model (Pickering & Branigan, 1998) claims that when speakers process a sentence, they activate a lemma that is later reused in production. This activation is thus what drives priming. Evidence for this model comes from lexical repetition, which seems to increase the degree of priming in the short-term (Branigan et al., 2005). On the other hand, the implicit learning model (Chang et al., 2006) proposes that exposure to a sentence makes speakers implicitly extract probabilistic information and create structural associations, which lead to the production of similar syntactic structures. Under this view, learning is seen as mere adaptation. Evidence supporting this model comes from priming research with amnesiac patients, from studies that do not involve any type of lexical repetition, and from the finding that priming is still effective after some time has elapsed between the prime and the target (Ferreira et al., 2008). These two models, however, are not mutually exclusive, as immediate priming effects could be explained by activation, whereas long-term priming effects could be explained by learning. In this sense, multifactorial accounts are also popular. This is also supported by the role of memory in the priming process: It seems that immediate priming (short-term priming in the absence of intervening lags between the prime and the target) could be driven by explicit memory processes, whereas long-term priming could be driven by implicit memory processes (Benolet, et al., 2016). Another important factor that plays a role is frequency, as an inverse frequency effect has been usually documented whereby priming is higher with less frequent structures (Jaeger & Snider, 2013). That is, we should see a stronger priming effect with constructions that speakers barely produce, as those would generate a ‘surprisal effect’. If, by contrast, the construction is already frequent among speakers, structural priming would not have such a strong effect.

3. The role of frequency in L2 priming

Even though the inverse frequency effect has been widely attested with monolingual speakers (Bernolet & Hartsuiker, 2010; Jaeger & Snider, 2013; Kaschak et al., 2011), it has not received a lot of attention in the L2 priming literature. The few available studies that have investigated this question have done so testing proficient L2 speakers (Flett et al., 2013; Ruf, 2011; Shin & Christianson, 2012). Those studies have usually found that L2 frequency modulates the priming effect. In other words, how frequent the construction is in the speakers' L1 has minimal impact on the priming effect. Therefore, more studies are needed testing less proficient L2 speakers, as it is at lower levels of proficiency that the L1 has a stronger influence on the speakers' L2 (Schwartz & Sprouse, 1996).

To our knowledge, only the study by Jackson and Ruf (2017) has examined this question. They analyzed structural priming in intermediate L2 German speakers (L1 English), both in an immediate and in a post-priming task. The participants were primed to produce fronted temporal (*Im Winter trägt Paul eine Jacke*, 'In winter Paul wears a jacket') and locative (*Auf dem Tisch steht eine Lampe*, 'On the table stands a lamp') phrases in German as opposed to the regular German word order (*Paul trägt im Winter eine Jacke*, 'Paul wears a jacket in winter'; *Eine Lampe steht auf dem Tisch*, 'A lamp stands on the table').

Jackson and Ruf found that, even though both structures primed in the immediate condition (especially when there was lexical overlap), only fronted temporal phrases primed in the post-priming task. This might be due to the fact that fronted temporal phrases are more frequent than locatives both in German and English. In turn, this might have led to stronger representations of that word order. These results show that immediate priming effects are not affected by any of the participants' languages (neither the L1 nor the L2), whereas priming effects in the longer-term are. However, since in both of the languages tested there is a preference for fronted temporal phrases versus fronted locative phrases (i.e., higher construction frequency), it is not clear which of the languages, if any, was driving the effect.

In order to determine which of the two languages exerts a greater influence on the priming effect, it would be necessary to expose speakers to two different constructions, such that one of them is more frequent in the L1 and the other one is more frequent in the L2. If the priming effect differs, then we would be able to resolve which of the two languages plays a more significant role in the priming process. This is precisely what we tested in our study, which we describe in the following section.

4. The present study

4.1. Goal of the study

The current study investigates which of the speakers' languages (L1 or L2), if any, plays a greater role in the priming process. Although previous studies

testing advanced L2 speakers have shown that the L1 has a minimal impact, it is still unclear whether the same holds true with L2 speakers at lower levels of proficiency.

To determine the role each language plays, we focus on construction frequency. Priming research has consistently shown that it is with infrequent constructions that the priming effect is stronger. At the same time, Jackson and Ruf (2017) found that how frequent a construction is in a language also plays a role in the priming process, as it was with frequent constructions that the priming effect extended beyond immediate exposure.

To explore this more in depth, we primed a group of L2 speakers with two Spanish constructions they barely produce, and which differ in terms of frequency: verbal passives (infrequent construction in Spanish but common in English) and Spanish clitic constructions (frequent construction in Spanish but non-existent in English). If there is more priming with verbal passives than with clitic constructions, we would conclude that the speakers' L1 (English) plays a greater role in the priming effect, as passives exist in English and are more frequent than in Spanish. If, on the other hand, we see more priming with clitic constructions than with verbal passives, we would conclude that the speakers' L2 (Spanish) plays a greater role instead, since clitic constructions are quite frequent in Spanish but do not exist in English. In the following section, we describe these two target constructions.

4.2. Target constructions

4.2.1. Spanish verbal passives

The Spanish passive construction that is the focus of this study is known as periphrastic passive or verbal passive, though some studies refer to it as the *fue*-passive. This type of passive consists of the conjugated verb *ser* ('to be') followed by a past participle, as in (1). The syntactic subject of the construction is the notional object of the transitive verb, whereas the subject of the transitive verb is the syntactic patient (Mendikoetxea, 1999).

- (1) El barco fue hundido por el capitán.
 The ship was sunk by the captain
 'The ship was sunk by the captain.'

Verbal passives are quite infrequent in spoken language, and they are usually limited to very formal registers, such as journalistic and academic texts (Green, 1975). A search using the CORPES online corpus (Real Academia Española) showed that verbal passives had a frequency of 6.45 out of a million in spoken language, and a frequency of 1,195.55 out of a million in written discourse. These low frequency rates are partly explained by the fact that Spanish also has an impersonal, reflexive *se*-passive (2), which is much more common both in oral and written discourse. This contrasts with the use of verbal passive constructions in other languages such as English, which are used significantly more often than

in Spanish (Prat-Sala, 1997). For example, verbal passives in English have a frequency of 17,500 out of a million in written academic texts, and a frequency of 6,500 out of a million in written fictional texts (Biber et al., 1999).

- (2) Se_i venden tomates_i.
 3p-refl sell tomatoes
 ‘Tomatoes are sold.’

The acquisition of Spanish verbal passives usually occurs late, as in other languages (Berman & Slobin, 1994). In a forced elicitation task, Pierce (1992) found that Spanish children were able to comprehend verbal passives between the ages of four and five. Tolchinsky and Rosado (2005), who investigated in what contexts elementary school students used verbal passives, found that these constructions were more frequent in written than in oral discourse. Moreover, they also found that older students used verbal passives more often than younger students, even in oral discourse.

The active-passive alternation has been previously used in structural priming studies, mostly in English (Bock, 1986; Kim & McDonough, 2008). However, the studies that have used the passive in Spanish have mostly tested cross-linguistic syntactic priming (Hartsuiker et al., 2004; Vasilyeva et al., 2010). Only a small-scale study by Flett (2003) investigated within-language L2 structural priming using the Spanish active-passive alternation. Flett analyzed whether this alternation could prime Spanish native speakers (N = 12), intermediate Spanish L2 learners (N = 12), and advanced Spanish L2 learners (L1 English) (N = 12). Using a picture description task via a confederate, participants were primed to produce passive constructions instead of active constructions. Flett found that all groups of speakers were primed with passive sentences, but priming rates were higher in the advanced L2 speakers. The Spanish native speakers produced fewer passives than expected, probably because the verbal passive is more frequent in written than in spoken Spanish. As for the L2 speakers, Flett reasoned that advanced learners were more sensitive to priming than intermediate learners because their syntactic representations were stronger. The fact that advanced L2 speakers were more primed than native and intermediate L2 speakers may be related to degree of exposure to written language, but given the low number of participants of this study, this result needs to be followed up.

4.2.2. Spanish clitic constructions

Spanish ditransitive sentences contain the dative clitic *le* and the case marker *a* (3). The dative clitic agrees with the DP that functions as indirect object and is an internal argument of the verb, whereas the case marker *a* licenses the indirect object DP. These constructions are known as (dative) clitic doubling constructions. In terms of semantics, the indirect object of the sentence might take different thematic roles, such as recipient or locative (Fernández-Alcalde, 2014).

- (3) Antonio le_i envió una carta a su hermana.
 Antonio 3pIO sent a letter to his sister
 ‘Antonio sent his sister a letter.’

Spanish clitic doubling constructions have a prepositional alternation (4), where there is no clitic and where *a* is analyzed as a preposition that licenses a PP. Despite the fact that both constructions (i.e., clitic doubling constructions and prepositional constructions) are very similar on the surface they are in fact structurally different, since in the prepositional construction the indirect object is not an internal argument of the verb (Cuervo, 2003).

- (4) Antonio envió una carta a su hermana.
 Antonio sent a letter to his sister
 ‘Antonio sent a letter to his sister.’

Studies of Spanish native speakers show that there is a great deal of variation in the production of clitic doubling constructions. Company (2006) created and analyzed a linguistic corpus with oral and written data from the second half of the 20th Century in several Spanish varieties and found that clitic doubling was less common (though still preferred) in Peninsular Spanish, where speakers used clitic doubling around 64% of the time. Speakers of Latin American varieties of Spanish were found to use clitic doubling constructions more frequently, with Mexico being the country where clitics were doubled the most, with a rate of 89%. Despite these differences, results show that there is a strong tendency in Spanish in general to use clitic doubling constructions as opposed to prepositional constructions overall.

Spanish native speakers acquire clitics at a very young age. Torrens and Wexler (2000), for example, analyzed longitudinal data from a monolingual Spanish girl and found that the child used some instances of dative clitic doubling constructions by age 1;10 already, and between ages 2;4 and 3;11 the child’s production of clitic doubling constructions increased considerably. Furthermore, the child displayed knowledge of obligatory and optional (i.e., alternation) dative clitic contexts from the very beginning. This early emergence and use of clitic doubling constructions contrasts with the later age of acquisition and use found for verbal passive sentences.

According to some analyses (Demonte, 1995), Spanish clitic doubling constructions were hypothesized to be comparable to double object constructions in English (5), in a way that both languages would share the same internal structure, even though the surface form of these are very different.

- (5) John gives Mary a book.

That is, English double object constructions do not have clitics or case markers, but they do present a rigid syntactic word order (verb + indirect object + direct object). Conversely, word order in Spanish is not rigid and any object can

come first in a clitic doubling construction (although word order is usually governed by pragmatic reasons). In this study, we will assume that even though double object constructions are very productive in English L1 speakers, L2 Spanish speakers (L1 English) will not necessarily equate the two constructions and readily produce clitic doubling constructions in Spanish. In fact, some studies in L2 acquisition have investigated this claim. For example, Montrul (1999) administered a grammaticality judgment task, which included grammatical and ungrammatical Spanish sentences with clitic doubling constructions, to L2 Spanish learners (L1 English and L1 French) and found that the French L1 group did not have problems with the acceptability of such constructions, but the English L1 group did. Similarly, Perpiñán and Montrul (2006) investigated whether L2 Spanish learners (L1 English) transferred the English double object construction into Spanish, omitting clitics and case markers. According to their results, intermediate L2 Spanish learners most often did omit clitics and case markers, while the advanced learners performed like native speakers. In terms of production, Montrul (2010) found that Spanish L2 speakers (L1 English) produced far fewer clitics than Spanish native speakers. Generally, it seems that L2 Spanish speakers whose L1 does not have clitics (e.g., English) acquire the morphosyntactic representation of the construction when they reach an intermediate level of proficiency. However, when it comes to production, they usually opt for using other English-like constructions, such as prepositional constructions. Based on these L2 acquisition background, Spanish clitic doubling constructions are ideal to investigate the role of construction frequency on structural priming.

4.3. Research questions and predictions

The study answers three main research questions:

1) What structure from each alternation is preferred by Spanish L2 speakers?

We will first determine average production rates of actives vs. passives and of clitic vs. prepositional constructions by Spanish L2 speakers. The answer to this research question will provide a baseline for the subsequent priming phase. We expect intermediate L2 speakers to use active sentences instead of passive sentences, as they are much more frequent, especially in oral discourse. As for clitic doubling or prepositional constructions, we expect the L2 speakers to opt for prepositional constructions as opposed to clitic constructions. This is due to the fact that their L1 (English) does not have clitics, and prior research has shown that speakers of Germanic languages usually favor prepositional constructions in these contexts.

2) Can structural priming modify initial preferences?

If the baseline phase shows that passive sentences and clitic doubling constructions are barely produced by L2 speakers, we will prime them to increase their production rates. We predict that priming will be effective in increasing the production of both constructions by L2 speakers, due to the inverse frequency effect.

3) Does construction frequency play a role in structural priming?

Construction frequency can play different roles in structural priming, depending on whether it is either driven by the speakers' L1, the L2, or none of the languages (i.e., independent). If L2 construction frequency drives structural priming, then priming should be stronger with the construction that is more frequent in the L2 (i.e., Spanish). For example, if speakers are primed to produce both passive sentences and clitic constructions, they should show stronger priming effects with clitic constructions than with passive constructions, as clitic constructions are more frequent in Spanish than verbal passives. If, on the other hand, L1 construction frequency is what drives structural priming, then speakers would show stronger priming effects with those constructions that are more frequent in their L1 (i.e., English). In this case, again, if speakers are primed with passive constructions and with clitic constructions, stronger priming effects should be observed with passives than with clitic constructions, since passives are frequent in English and clitic constructions are non-existent. Finally, it could be that structural priming is not motivated by the speakers' L2 nor the L1. In other words, structural priming could be frequency-independent. In this case, speakers should show equal priming effects with both constructions.

According to Jackson and Ruf (2017), immediate structural priming effects might not be very informative, since they found that construction-frequency effects were only observable in a post-priming task. To evaluate non-immediate effects of priming and potential implicit learning effects, the current study includes a post-priming phase (5 minutes later) in order to better ascertain the potential influence of the L1 on structural priming.

4.4. Participants

A total of 28 Spanish L2 speakers were recruited. These were all undergraduate students at an American university at the time of testing. The participants completed a Spanish proficiency test and a linguistic background questionnaire. The proficiency test consisted of parts of the DELE written exam, and it included a multiple-choice task and a cloze passage. This measure has been used in other Spanish L2 studies (Montrul & Slabakova, 2003). The maximum score possible was 50 points and the mean score was 27.2 (SD: 5.9, range: 18-38), which places these Spanish L2 speakers at a low-intermediate level on average.

The linguistic background questionnaire was used to determine whether speakers had English as their native language. Additionally, it also helped exclude Spanish heritage speakers, since they were not the focus of this study. The questionnaire consisted of 15 questions and was based on the questionnaires available on the National Heritage Language Resource Center website (Gignoux, 2009; Montrul, 2012; Torres, 2012).

4.5. Methodology

In the study, participants firstly completed a baseline task in order to answer the first research question and to confirm their initial preferences (i.e., low

production rates of passive sentences and clitic doubling constructions). Secondly, they completed two syntactic priming tasks: one to prime them with passive sentences and the other one to prime them with clitic doubling constructions. Finally, participants completed a post-priming task five minutes after the main priming tasks. This post-priming task was very similar to the baseline task in that participants were not primed and was included to assess possible non-immediate effects of syntactic priming, following Jackson and Ruf (2017).

The study was divided into two sessions. In the first session, participants completed the baseline task as well as the two questionnaires. In the second session, participants completed both priming tasks and the post-priming task. The order in which participants completed the priming tasks was counterbalanced. The post-priming task was completed five minutes after the second priming task. The three phases of the study followed a picture description methodology (Bock, 1986), but participants were told they were taking part in a memory study, in order for them to focus on the pictures instead of on the constructions.

The baseline task took approximately 10 minutes to complete, and it was presented on a computer screen. In this first phase of the study, participants saw several pictures accompanied by a Spanish verb in the infinitive form. Their task was to create a sentence using the verbs given to describe the pictures. They were free to use whatever tense they wanted, and they could also add as many details as they wished. All sentences were orally recorded for subsequent analyses. For the covert task to be credible, some distractor yes/no questions were included throughout the task. These questions asked participants if they had seen a given picture. In the second session of the study, structural priming was administered. Like in the baseline task, the priming tasks were also presented on a computer screen, and each of them took about 15 minutes to complete. Although each priming task was designed to prime participants with a different construction, both tasks followed the same methodology. In the priming tasks, participants had to do two things: they were presented with pictures accompanied by full sentences in Spanish that they had to read (primes) and they also had to produce their own descriptions in those cases where only a verb in the infinitive was provided (targets). The goal was for them to produce the same structure in the targets as in the primes. This time, participants were also told this was a memory task, so distractor questions were also included. All oral descriptions were audio-recorded.

Lastly, the post-priming task conducted 5 minutes after the priming task followed the same procedure as the baseline task. Participants only had to describe pictures using the verbs provided without any priming intervention.

4.6. Materials

The number of pictures shown in each phase of the study differed. In the baseline, 21 pictures accompanied by Spanish verbs in the infinitive were created. Out of those 21 pictures, 7 picture-verb combinations allowed for the active-passive alternation, 7 picture-verb combinations allowed for the clitic doubling-prepositional alternation, and 7 picture-verb combinations were included as fillers.

There were 4 pictures for the covert memory task. All pictures were presented in a pseudo-randomized order, to prevent two distractor questions from appearing one right after another and were presented using the Paradigm software (Perception Research Systems, 2007).

The two priming tasks (one for passives, one for clitic constructions) included both primes and targets in addition to fillers and distractor questions. Each priming task consisted of 16 sets designed to elicit either of the two target constructions. Within each set, there were 4 fillers, 2 prime sentences, and 1 target picture, in that order. Fillers consisted of a picture accompanied by a full sentence in Spanish with a structure different from the ones being tested. Primes followed the same format, although all sentences contained the target structure to prime participants, depending on the task. As for targets, these were pictures accompanied by a Spanish verb in the infinitive form, like in the baseline. Furthermore, there were 5 distractor questions for the covert memory task. Sets appeared in a pseudo-randomized order, in such a way that distractor questions never appeared between a prime and a target. The post-priming task contained the same amount of materials as the baseline task, as it followed exactly the same methodology. However, the pictures were different.

5. Results

Once all participants' picture descriptions were recorded, every audio was transcribed and coded according to the variables of interest. Thus, each sentence was coded depending on whether it was produced during the baseline, one of the two priming tasks or the post-priming task. Sentences produced after pictures that allowed for the active-passive alternation were coded as 'active' or 'passive' depending on the verb. Likewise, sentences produced after pictures that allowed for the clitic-prepositional construction alternation were coded as 'clitic' or 'prepositional'. Lastly, sentences were coded depending on whether they matched the target construction or not ('yes' if it was a passive sentence or a clitic doubling construction and 'no' if it was an active sentence or a prepositional construction).

Data from the active-passive alternation showed that no participant produced a passive sentence in the baseline (Table 1). That is, they only produced active sentences. In the priming task, however, after participants were primed to produce passive sentences, they did produce some passives. The results of the post-priming task showed the same results as the baseline: no passives produced. These results seem to suggest that priming was successful but that its effects did not last longer than 5 minutes.

Table 1. Production of passive sentences by phase

Baseline			Priming			Post-priming		
M	SD	%	M	SD	%	M	SD	%
0.00	0.00	0.00	3.96	4.56	24.78	0.00	0.00	0.00

Regarding the clitic-prepositional alternation, descriptive statistics showed that speakers preferred prepositional constructions in the baseline (Table 2). However, as in the passive priming task, speakers also increased their production of clitic constructions in the priming task. Lastly, data from the post-priming task showed that speakers used clitic constructions more often than in the baseline.

Table 2. Production of clitic constructions by phase

Baseline			Priming			Post-priming		
M	SD	%	M	SD	%	M	SD	%
0.79	1.17	11.2	4.27	4.16	27.68	2.04	2.46	29.23

We ran a mixed-effects binomial logistic regression using R (R Core Team, 2017) and the lme4 package (Bates et al., 2015). Our dependent variable was the production of the target construction ('yes' or 'no'), whereas construction ('passive' or 'clitic') and phase ('baseline', 'priming', or 'post-priming') were included as fixed effects. Participant and item were included in the model as random effects. The output from the model can be seen in Table 3.

Table 3. Results of the mixed-effects binomial logistic regression model

Fixed effects				
	Estimate	SE	z-value	p-value
(Intercept)	-3.993	.380	-10.509	< .001
Construction-clitic	.923	.152	6.093	< .001
Phase-postpriming	1.233	.279	4.414	< .001
Phase-priming	2.118	.252	8.419	< .001
Random effects				
		Variance	SD	
Item	(Intercept)	.170	.412	
Participant	(Intercept)	1.720	1.311	

Results show that there was an overall priming effect in the priming and the post-priming tasks, with speakers producing more target constructions in those two tasks compared to the baseline. At the same time, speakers produced significantly more clitic constructions than passive sentences.

6. Discussion and conclusion

The present study aimed to determine the role that construction frequency plays in L2 priming with a group of speakers at an intermediate level of proficiency. This, in turn, will provide an insight into how the speakers' L1 and L2 interact and drive this language processing phenomenon.

When primed with two Spanish constructions they barely produce (i.e., verbal passives and clitic constructions), Spanish L2 speakers showed a significant immediate priming effect, probably motivated by the inverse frequency effect. That is, since they barely produced those structures during the baseline, a brief priming task made them increase their production rates of both target constructions. However, when completing a post-priming task five minutes after the priming task, speakers only showed a priming effect with clitic constructions (and not with passives). This suggests that longer-term priming effects are motivated by how frequent the target construction is in the speakers' L2 (Spanish), and not in their L1 (English). Otherwise, they would have shown a priming effect in the post-priming task with passives, and not with clitic constructions.

Our results are in line with those that have tested construction frequency effects with L2 speakers at advanced levels of proficiency (Flett et al., 2013; Ruf, 2011; Shin & Christianson, 2012). Even though transfer effects are more prominent at intermediate stages of proficiency, our L2 group did not show transfer from their L1, like advanced L2 speakers. At the same time, since our study tested only L2 speakers at an intermediate level of proficiency, future studies could include L2 speakers at varying levels of proficiency to examine the interaction between proficiency and degree of priming more closely, which is a question that has not been explored yet.

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