Heritage Grammars and Language Change: The Case of Clitic Doubling in Spanish

Mercedes Martinez Bruera, Daniel Weingärtner, Andrea Listanti, Carolina Gattei, Carlos J. Alvarez, Horacio Barber, Esther Rinke and Sol Lago

Author information

Mercedes Martinez Bruera | ORCID: 0009-0004-2891-7045, Goethe University Frankfurt, Institute for Romance Languages and Literatures, Germany, martinezbruera@em.uni-frankfurt.de

Daniel Weingärtner | ORCID: 0009-0005-4223-6091, Goethe University Frankfurt, Institute for Romance Languages and Literatures, d.weingaertner@em.uni-frankfurt.de

Andrea Listanti | ORCID: 0000-0002-7925-6222, University of Cologne, Department of English Studies, alistant@uni-koeln.de

Carolina Gattei | ORCID: 0000-0002-7490-3363, Universidad Torcuato Di Tella, Escuela de Gobierno y Laboratorio de Neurociencia, Argentina, carogattei@utdt.edu

Carlos J. Alvarez | ORCID: 0000-0003-2737-956X, Universidad of Laguna, Cognitive, Social and Organizational Psychology, Spain, calvarez@ull.edu.es

Horacio Barber | ORCID: 0000-0001-9425-1633, Universidad of Laguna, Cognitive, Social and Organizational Psychology, Spain, hbarber@ull.edu.es

Esther Rinke | ORCID: 0000-0001-9378-9079, Goethe University Frankfurt, Institute for Romance Languages and Literatures, Germany, esther.rinke@em.uni-frankfurt.de

Sol Lago | ORCID: 0000-0002-4966-1913, Goethe University Frankfurt, Institute for Romance Languages and Literatures, Germany, sollago@em.uni-frankfurt.de

Abstract: Some differences between the grammar of heritage and monolingual speakers have been attributed to grammatical innovation, such that heritage behavior may reflect ongoing patterns of diachronic change. We examined this claim by comparing the acceptability of clitic doubling in three different speaker groups: monolingual and heritage speakers of European Spanish, and Rioplatense Spanish monolinguals. Accusative clitic doubling is grammaticalized in Rioplatense but not in European Spanish, consistent with Rioplatense Spanish being a more diachronically innovative variety. If heritage speakers mirror diachronic change, they may perform more similarly to Rioplatense than European monolinguals. The results of an acceptability judgement task showed that heritage speakers had robust knowledge of clitics but did not show evidence of progressive behavior with accusative clitic doubling. We propose that grammatical innovation may crucially depend on the demographic characteristics of heritage speakers, and on the grammatical properties of the phenomenon tested.

Keywords: clitic doubling, diachronic change, acceptability, heritage speakers, language varieties, Spanish

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1 Introduction

The grammar of heritage speakers sometimes diverges from that of speakers raised in a monolingual environment, i.e., speakers who acquired only one language at home in early childhood. This has been attributed to several factors, including crosslinguistic influence or dominant language transfer (Duffield, 2018; Ionin & Montrul, 2010; Shin et al., 2023), first language attrition (Bylund, 2009; Flores, 2010; Montrul, 2016), and variable input quantity and quality (Rinke & Flores 2014; Pham & Tipton, 2018; Sorenson Duncan & Paradis, 2018). More recent approaches suggest that some differences between heritage and monolingual speakers may also reflect grammatical innovation. Specifically, heritage speakers may reflect patterns of diachronic change by introducing and/or extending the use of specific structures within a language (Kupisch & Polinsky, 2021; Rinke & Flores, 2014). A key prediction of these approaches is that heritage and monolingual speakers should diverge with regard to linguistic structures that are undergoing—or have recently undergone—diachronic change. This prediction has yet to be systematically investigated across languages and grammatical constructions.

The current study addresses this prediction by providing empirical evidence from clitic doubling in Spanish. Clitic doubling refers to the co-occurrence of a clitic and a coreferential noun phrase—or strong pronoun—within the same syntactic and prosodic unit (Gabriel & Rinke, 2010; Zdrojewski, 2013). Clitic doubling in Spanish has undergone diachronic change. Specifically, clitic-doubled dative object noun phrases have been grammatical across Spanish varieties since the seventeenth century, e.g., "Claudia le_i dio un regalo a $Juan_i$" ('Claudia CL.DAT$_i$ gave a present to $John_i$'). By contrast, accusative clitic doubling, such as "Claudia lo_i vio a $Juan_i$" ('Claudia CL.ACC$_i$ saw $John_i$') is diachronically more recent and restricted to particular Spanish varieties (Fischer & Rinke, 2013; Luján & Parodi, 2001; Rinke et al., 2023; Zdrojewski & Sánchez, 2014).

Our study compares heritage speakers of a variety that does not accept accusative clitic doubling (European Spanish) with monolingual speakers of two varieties: one that accepts accusative clitic doubling and one that does not (Rioplatense vs. European Spanish). This design allows directly assessing whether heritage speakers display an innovative behavior with accusative clitic doubling by acting more similarly to the diachronically advanced Rioplatense Spanish monolinguals, as compared to the less diachronically advanced European Spanish monolinguals.

2 Background

2.1 *Previous Research Relating Variability in Heritage Languages to Diachronic Change*

Heritage speakers are successive or simultaneous bilinguals who acquired their heritage language at home from birth and a societally dominant language later on in life (Rothman, 2009; Valdés, 2001). The grammar of heritage speakers does not always converge with the grammar of speakers raised in a monolingual environment. Previous research has identified intra- and extra-linguistic factors as sources of variation in heritage languages (e.g., Paradis, 2023). However, while these factors help explain why variation occurs, they don't offer a systematic framework for understanding why heritage and monolingual language acquisition sometimes produce different outcomes. To bridge this gap, recent approaches have proposed that some differences between monolingual and heritage grammars reflect diachronic change (Hurtado & Montrul, 2025; Kupisch & Polinsky, 2021; Polinsky & Scontras, 2019; Rinke & Flores, 2014; Rinke et al., 2018; Rinke et al., 2024; Rothman, 2007).

There are several reasons why heritage speakers might mirror diachronic change. One possibility is related to the way in which children acquire constructions that are subject to variability. For example, Hudson Kam and Newport (2005) showed that child learners tend to regularize structures that are used non-systematically more than adult learners. Due to their acquisition circumstances, heritage children may receive less systematic input than monolingual children, which may drive them to regularize their grammar even more, and thus accelerate language change. Another possibility may be associated with processing benefits. Specifically, it has been proposed that diachronic change is driven by a processing advantage associated with the more progressive option (Roberts & Rousseau, 2003; Sinnemäki, 2014). Due to increased processing demands (likely as a result of a reduced use of the heritage language and/or co-activation of two languages), heritage speakers may strongly favor easier-to-process structures, thus showing a stronger preference for progressive over conservative options. Importantly, and regardless of whether the underlying explanation lies in regularization or a processing benefit, a consequence of these proposals is that one should be able to predict the behavior of heritage speakers with linguistic phenomena that are undergoing—or have undergone—diachronic change.

Evidence supporting this claim has been found in the comprehension of inflected infinitives in Brazilian Portuguese. Rothman (2007) used a grammaticality judgment and a context-sentence matching task to compare three groups of Brazilian Portuguese speakers: monolingual, heritage, and advanced second language (L2) learners with English as a first language. Participants rated the acceptability of inflected infinitives, a phenomenon in which a non-finite verb agrees in person and number features with its grammatical subject. In spoken varieties of Brazilian Portuguese, inflected infinitives are disappearing, likely because they are acquired mostly through formal education. Therefore, heritage speakers, who have limited access to formal education, should be less likely to acquire inflected infinitives. The results showed that Brazilian Portuguese heritage speakers barely accepted inflected infinitives, similarly to monolingual and L2 groups. Heritage speakers also performed at chance level when asked to match sentences containing an inflected infinitive with an appropriate context. These results demonstrate that the behavior of heritage speakers converged with ongoing patterns of diachronic change.

Another link between diachronic change and heritage behavior was proposed for the spontaneous production of null objects in European Portuguese. Rinke and colleagues (2018) conducted a corpus study comparing corpora from four populations: older first-generation Portuguese migrants in Germany, younger European Portuguese heritage speakers in Germany, and two aged-matched monolingual groups—one for the older generation and one for the younger generation. The results showed that the younger (bilingual and monolingual) generations produced more null objects than the older generations—33.1% and 29.6% vs. 24.3% and 14.9%, on average. Further, syntactic and semantic analyses of the speech data showed that the heritage speakers extended the semantic-pragmatic conditions of null object realization along a specific referential hierarchy, attested in the diachronic development of Portuguese. These findings suggest that heritage speakers can show the same direction of change as ongoing patterns within the same language.

Recently, Kupisch and Polinsky (2021) have systematized the link between heritage language variation and diachronic change by reviewing previous studies on the grammaticalization of definite and indefinite articles in languages like German, English, Spanish, Italian, and Mandarin Chinese. They showed that heritage speakers of Spanish and Italian were likely to accept bare nouns with a generic reading, which is ungrammatical in the monolingual varieties. These results were found regardless of whether the environmental language had bare nouns with a generic

reading. To explain this pattern, it was proposed that heritage speakers were innovative with articles, such that they moved along the diachronic path of article grammaticalization at a faster rate than monolingual speakers.

Overall, the research summarized above suggests that heritage speakers can sometimes reflect processes of language change. Our study builds on this idea by proposing that heritage speaker variation could be predicted by examining already attested diachronic developments. Specifically, attested diachronic changes could provide insight into which phenomena may be especially innovative in heritage languages. Since heritage speakers are exposed to less variable input and have limited access to formal education in their heritage language, they may be more sensitive to linguistic innovations in their input and thus mirror ongoing patterns of change. We test this hypothesis by investigating a phenomenon that is currently undergoing diachronic change in Spanish: clitic doubling.

2.2 *Patterns of Diachronic Change with Clitic Doubling*

Clitic doubling is the co-occurrence of a clitic and a coreferential object within the same syntactic and prosodic unit (Gabriel & Rinke, 2010; Zdrojewski, 2013). In (1), the dative clitic *le* doubles the indirect object *Juan* while still being inside the same syntactic and prosodic unit. This differentiates clitic-doubled structures from clitic left- and right-dislocated structures (Anagnostopoulou, 2016; Di Tullio et al., 2019). In dislocated structures like (2), the clitic and the coreferential object are not contained in the same prosodic and syntactic unit, and thus the object is interpreted as a topic (Gabriel & Rinke, 2010).

(1) Dative clitic doubling

Claudia	le_i	dio	un regalo	a $Juan_i$
Claudia	*CL.DAT*$_i$	*gave*	*a present*	*to Juan*$_i$

(2) Clitic left dislocation

A $Claudia_i$,	Juan	le_i	dio	un regalo
To Claudia$_i$,	*Juan*	*CL.DAT*$_i$	*gave*	*a present*

It has been proposed that the diachronic development of clitic doubling can be divided into three main stages (Di Tullio et al., 2019; Fischer & Rinke, 2013; Gabriel & Rinke, 2010; Leonetti, 2007). Specifically, clitic doubling evolved from clitic right dislocation. Strong pronouns were the first ones to be doubled, because they were the most topical element. The frequency of clitic doubling with strong pronouns increased from 20% to 80% between the 15th and 16th centuries, as shown in (3). During the 17th and 18th centuries, the doubling of dative noun phrases began appearing and became increasingly common, as shown in (4). The final step—the doubling of accusative noun phrases—is attested to date only in some Spanish varieties, such as Rioplatense and Limeño, as shown in (5). Fischer and Rinke (2013) proposed that the extension of clitic doubling is implicational, meaning that it is not possible to have doubling of accusative noun phrases like (5) without also having doubling of dative noun phrases like (4). Additionally, the doubling of dative noun phrases must be preceded by doubling of full pronouns like (3).

(3)

Claudia	le_i	dio	un regalo	a él
Claudia	*CL.DAT*$_i$	*gave*	*a present*	*to him*

(4) Claudia le$_i$ dio un regalo a Juan$_i$
Claudia *CL.DAT*$_i$ *gave* *a present* *to Juan*$_i$

(5) Claudia lo$_i$ vio a Juan$_i$
Claudia *CL.DAT*$_i$ *gave* *to Juan*$_i$

The availability of clitic doubling across Spanish varieties is attributed to the specific step reached by a variety. Specifically, the doubling of stressed personal pronouns like (3— regardless of the case of the object—is acceptable across varieties (Fernández Soriano, 1999), which shows that they have all passed the first step. Similarly, most varieties accept clitic-doubling with dative noun phrase objects. However, only some varieties have reached the third step: the doubling of accusative noun phrase objects, which is mostly found in Rioplatense Spanish in Argentina and Uruguay, and in Limeño Spanish in Perú (Jaeggli, 1993; Zdrojewski & Sánchez, 2014). Even in these varieties, the doubling of accusative objects has a restricted distribution: The doubled noun phrase object has to be marked with the differential object marker *a* (Di Tullio et al., 2019), and the doubled accusative object is typically animate, definite, and specific (Sánchez & Zdrojewski, 2019).

The contrast in clitic doubling between current European and Rioplatense Spanish is attested in corpus data from spontaneous speech in production (Rinke et al., 2018), and more recently, in judgment data in comprehension (Rinke et al., 2023). Rinke and colleagues (2023) used an acceptability judgment task to compare monolingual speakers of Rioplatense Spanish (living in Buenos Aires and surrounding regions) with monolingual speakers of European Spanish (living in Canarias). Participants rated the acceptability of sentences with accusative and dative clitic-doubled animate definite objects against their non-doubled counterparts using a 1–7 Likert scale. The results showed a difference between dative and accusative objects. With dative objects, speakers of both varieties preferred doubled to non-doubled sentences. By contrast, accusative clitic doubling was highly acceptable in Rioplatense Spanish, but not in European Spanish—5.8 vs. 2.6 points, on average.

The results above show that accusative clitic doubling has started to grammaticalize in Rioplatense but not in European Spanish, consistent with Rioplatense Spanish being a diachronically more innovative variety. However, previous studies have not tested heritage speakers of European Spanish. Thus, it is unknown whether they would mirror the judgments of monolingual speakers of Rioplatense Spanish. Such a result would be consistent with innovative behavior and support a link between diachronic change and heritage languages. Addressing this gap is the goal of the current study. Before describing the study, we review what is known about clitic doubling in Spanish heritage speakers.

2.3 *Clitic Doubling in Spanish Heritage Speakers*

In contrast with clitic left dislocation (Leal Méndez et al., 2015; Montrul, 2010; Montrul et al., 2015; Sequeros Valle et al., 2020; Viñas Puig, 2019), research on clitic doubling in Spanish heritage speakers is scarcer and has mostly focused on dative clitic doubling (Irizarri van Suchtelen, 2014; Luján & Parodi, 2001; Montrul, 2004, 2010; Montrul et al., 2015). The combined results of these studies suggest that dative clitic doubling is acquired and used consistently by Spanish heritage speakers. For example, Montrul (2010) compared monolingual, second language (L2), and heritage Spanish speakers living in the United States. The results of three tasks, one of which was a written acceptability study, showed that heritage and monolingual speakers preferred dative clitic-doubled sentences to their non-doubled counterparts—with no evidence of a difference

between heritage and monolingual speakers. A following acceptability study found that heritage and monolingual speakers of Mexican Spanish rated dative clitic-doubled sentences as more acceptable than non-doubled options (Montrul et al., 2015). In production, two studies by Montrul (2004) and Irizarri van Suchtelen (2014) tested Spanish heritage speakers with English or Dutch as a majority language. The results of picture description tasks showed a high production rate of dative clitic-doubled sentences, although at a lower rate in heritage vs. monolingual speakers.

By contrast, less is known about accusative clitic doubling (Hurtado & Montrul, 2025; Luján & Parodi, 2001; Montrul et al., 2015). In comprehension, Montrul and colleagues (2015) found that sentences with accusative doubled objects were rated as unacceptable by heritage speakers of Mexican Spanish. A later study examined both the acceptability and the production under priming of accusative clitic doubling by heritage speakers of Mexican Spanish (Hurtado & Montrul, 2025). In one acceptability task (which was a reanalysis of the data by Montrul et al., 2015), heritage speakers of Mexican Spanish did not generally accept sentences with accusative doubled objects, giving them a low rating—below 2.5 on a 4-point Likert scale. Further analyses revealed that the speakers with the lowest proficiency and longest length of residence in the United States accepted accusative clitic doubling the most. In a second acceptability study, heritage speakers of Mexican Spanish rated sentences with accusative clitic doubling more highly than the monolingual group—approximately 2.5 vs. 1.5, respectively—suggesting a more diachronically advanced behavior.

Meanwhile, the results of the priming experiment showed that monolingual and heritage speakers rarely produced accusative clitic doubling in the absence of priming. But the experiment also included conditions in which participants could see a sentence with accusative clitic doubling on the screen prior to uttering the target sentence. In these conditions, heritage speakers were more likely to produce sentences with accusative doubling, in contrast to the monolingual group, i.e., the production of sentences with accusative clitic doubling increased about 15% when primed. Thus, it was proposed that structural priming could act as a mechanism driving language change at an individual level: if experienced in daily life, accusative clitic doubling could end up being integrated into heritage speakers' grammar.

While these studies showed that heritage speakers differ from monolingual speakers in the expected direction of diachronic change, an open question is how heritage speakers compare to speakers of varieties that allow for clitic doubling, like Rioplatense Spanish. This comparison will show how far along the diachronic path heritage speakers are with regard to accusative clitic doubling. With this goal, our study compared heritage speakers of European Spanish with two groups of monolinguals: a group of a more conservative variety vs. a group of a more innovative variety—European vs. Rioplatense Spanish, respectively.

In contrast with previous studies, we tested heritage speakers with German (rather than English) as a dominant language. We did not expect the change in dominant language to play a major role, because neither English nor German have clitics or clitic doubling. However, since the circumstances of Spanish as a heritage language differ between the United States and Germany, we considered that sociolinguistic variables might play a role. In Germany, programs funded by the Spanish government support free heritage language classes for child heritage speakers of Spanish. Thus, in contrast with the United States, heritage speakers in Germany often have access to formal education, as well as more input and opportunities to use their heritage language. As reviewed in section 2.1, access to formal education may affect the likelihood of progressive behavior in heritage speakers (Rinke and Flores, 2014; Rothman, 2007). To account for this, our analysis included variables related to the exposure and use of the heritage language.

3 The Current Study

3.1 *Hypotheses and Predictions*

We tested whether heritage behavior with clitic doubling could be predicted by patterns of diachronic change. We compared a group of European Spanish heritage speakers with two monolingual groups: Rioplatense Spanish speakers living in Buenos Aires and neighboring regions in Argentina, and European Spanish speakers living in the Canary Islands in Spain. We examined whether accusative clitic doubling was more acceptable to heritage than monolingual speakers of European Spanish. Specifically, if heritage speakers reflect patterns of diachronic change in Spanish, we expected them to accept accusative clitic doubling to a larger extent and more similarly to Rioplatense monolinguals. On the other hand, if heritage speakers showed a conservative behavior, we expected them to disprefer clitic doubling to a similar extent to European Spanish monolinguals, thus showing evidence of having preserved the variety of their caregivers.

We additionally tested dative clitic doubling. This was done to ensure that any differences between heritage and monolingual speakers were due to innovative behavior specific to accusative clitic doubling—rather than to potential linguistic differences between groups, for example regarding their acceptance of clitic doubling in general. Thus, dative clitic doubling functioned as a sort of control or baseline manipulation. Specifically, since dative clitic doubling is highly acceptable across Spanish varieties, we expected all groups to accept sentences with dative clitic doubling.

3.2 *Material*s

Materials consisted of 32 experimental items, 32 filler items, and 7 attention checks, which were adapted from Rinke et al. (2023). The experimental items were distributed in a 2×2 design that manipulated whether a sentence was doubled or not (doubling vs. no doubling) and the grammatical case of the doubled object (dative vs. accusative; Table 1).

In the dative items, the indirect object could be doubled by the clitic *le*, which appeared preverbally. The sentence subject and indirect object were both animate and differed in gender. We used the same verbs as Rinke and colleagues (2023): *dar* (to give), *ofrecer* (to offer), *devolver* (to return), *vender* (to sell), *comprar* (to buy), *regalar* (to give away), *enviar* (to send), and *prestar* (to borrow).

In the accusative items, the verb in the doubled condition was preceded by a singular accusative clitic, which agreed in gender with the object: *lo* for masculine objects and *la* for feminine objects. The gender of the direct object was balanced across items, such that half were masculine and half were feminine. We used the same verbs as Rinke and colleagues (2023): *encontrar* (to find), *saludar* (to greet), *ver* (to see), *abrazar* (to hug), *empujar* (to push), *conocer* (to meet), *interrogar* (to ask), *buscar* (to seek). Experimental items were arranged such that each participant only saw two instances of each verb across trials.

The materials were adapted to the Rioplatense and European Spanish varieties to account for lexical and grammatical differences. For the stimuli to sound natural to speakers, the compound past tense was used in the European version of the experiment (e.g., *ha dado 'has given'*). For the Rioplatense version, the simple past tense was used (e.g., *dio 'gave'*), as this is the preferred option in this variety. Some words were also changed, for example 'swimming pool' was expressed as *piscina* in European Spanish but as *pileta* in Rioplatense Spanish. Two native speakers of each variety read and gave feedback on the stimuli. The items were recorded by two different speakers,

one from each variety, using Praat (Boersma, 2001). Cross-splicing was used to create the auditory stimuli (for details about the procedure, see Supplemental Materials 1).

We controlled which version of the stimuli participants heard: European Spanish speakers heard the European Spanish stimuli, while Rioplatense Spanish speakers heard the Rioplatense Spanish stimuli. This was done to ensure that their judgments reflected the acceptability of clitic doubling in their own variety. It has been shown that judgments can be influenced by the perceived nature of the producer, whether they are non-native or from a different language variety (Brehm et al., 2019). For our purposes, it was important to ensure that the judgments reflected the grammaticality status of the variety native to each group, rather than their judgments about the status of doubling in other Spanish varieties. We leave the latter issue for future research.

Table 1

Example of an experimental item set.

Condition	**Sentence**
Dative non-doubled	Laura dio flores a Rafael en el parque de las afueras de la ciudad. Laura gave flowers to Rafael at the park in the outskirts of the city. *Laura gave flowers to Rafael at the park in the outskirts of the city.*
Dative doubled	Laura le$_i$ dio flores a Rafael$_i$ en el parque de las afueras de la ciudad. Laura CL.DAT$_i$ gave flowers to Rafael$_i$ at the park in the outskirts of the city. *Laura gave flowers to Rafael at the park in the outskirts of the city.*
Accusative non-doubled	Laura vio a Rafael en el parque de las afueras de la ciudad. Laura saw DOM Rafael at the park in the outskirts of the city. *Laura saw Rafael at the park in the outskirts of the city.*
Accusative doubled	Laura lo$_i$ vio a Rafael$_i$ en el parque de las afueras de la ciudad. Laura CL.M.ACC$_i$ saw DOM Rafael$_i$ at the park in the outskirts of the city. *Laura saw Rafael at the park in the outskirts of the city.*

The filler items were designed to have high, mid, and low acceptability to ensure that participants made use of the full rating scale. There were 16 low, 8 high and 8 mid acceptability fillers. This was done to balance out the highly acceptable experimental items—for Rioplatense speakers, all experimental items were expected to be acceptable. The low acceptability fillers consisted of ungrammatical sentences, which included number, gender, or tense agreement violations. For example, we included sentences like *Las chicas estaban *obsesionados con la música del famoso cantante inglés* ('The girls were obsessed.MASC with the music of the famous English singer'). The mid acceptability fillers consisted of grammatical sentences with non-canonical word order, for example *Francisco con su novia terminó porque ella con él mala fue* ('Francisco with his girlfriend broke up, because she with him was mean'). In addition, 40 items belonging to a different experiment were included (not reported here).

Attention checks were included to ensure that participants were attentive during the task. They were sentences like 'Instead of judging this sentence, press number X,' where X was one of the seven rating values in the Likert scale. Participants had to answer 6 out of 7 attention checks correctly to be included in the analysis.

Finally, we designed a questionnaire that assessed that heritage speakers had the necessary knowledge of clitics to be able to evaluate clitic doubling in the judgment task. The test consisted of 16 questions assessing knowledge of clitic placement, gender, number and case agreement, clitic left dislocation, and object identification (Supplemental Materials 2). In order to be included in the analysis, monolingual speakers had to score 80% or higher in the clitic posttest. All stimuli, including experimental items, fillers, attention checks, and the clitic posttest are available at https://doi.org/10.17605/OSF.IO/NP8RF.

3.3 *Procedure*

All participants were tested online using PCIbex (Zehr & Schwarz, 2018). Participants first completed a demographic questionnaire (Supplemental Materials 3). This was followed by the auditory acceptability judgment task: participants listened to sentences and rated their acceptability on a scale from 1 (completely unacceptable) to 7 (completely acceptable). Each trial timed out after twenty seconds. Participants completed a practice round of three trials. Experimental items, filler, and attention checks were randomized for each participant such that trials from the same condition never appeared consecutively. Attention checks provided feedback for correct and incorrect responses, but experimental items did not. Participants were divided into four lists following a Latin-square design so that they would only see one condition of each experimental item. After the judgment task, participants did the untimed Spanish clitics posttest. An experimental session lasted 20–30 minutes.

3.4 *Participants*

We recruited 31 heritage speakers of European Spanish, 40 Rioplatense Spanish monolingual speakers and 115 European Spanish monolingual speakers. The larger number of European Spanish monolinguals was due to the fact that they were recruited from large university courses[1]. Following the study of Rinke et al. (2023), European monolinguals were speakers of Canarian Spanish. Rinke et al. (2023) argued that Canarian Spanish was a good variety to compare with Rioplatense Spanish because both varieties preserve the etymological use of clitics, and hence do not present leísmo, laísmo, or loísmo. Our study used a clitic posttest to directly measure the presence of leísmo. The results of the posttest suggested that monolingual and heritage European Spanish speakers selected the leísmo-consistent option on average 45% and 43% of the time respectively, while Rioplatense Spanish speakers did so only 5% of the time (Supplemental Materials 4). The percentage of leísmo-consistent responses in European Spanish speakers was more than expected, given the previous claim in Rinke et al. (2023). But crucially, while both groups showed more leísmo than Rioplatense Spanish speakers, it was not necessarily their default option, and it was comparable between groups.

Participants were recruited through social media in Germany (heritage group), at the University of La Laguna in Tenerife (European Spanish group) and at the University Torcuato di

[1]Because this difference in sample size could be problematic when directly comparing the groups, the between-group comparisons were performed with a random sample of 40 European Spanish monolinguals (out of the 115 participants originally tested).

Tella in Buenos Aires (Rioplatense Spanish group). They received either payment or university credit for their participation. The experiments were performed in accordance with the 1964 Declaration of Helsinki and its later amendments. The procedure was reviewed and approved by the Ethikkommission der Deutschen Gesellschaft für Sprachwissenschaft. All participants provided informed consent.

Heritage participants were included in the analysis if they reported that at least one of their caretakers was from Spain and that they used Spanish (or Spanish and German) at home with a family member. The monolingual groups were included in the analysis if they reported being born in the Canary Islands (European Spanish group) or in Buenos Aires (Rioplatense Spanish group), being native speakers of Spanish with no other language spoken at home during childhood, and if they scored above 80% in the clitic posttest. All participants had to report having normal or corrected vision and no history of language impairments. Finally, all participants had to answer correctly 6 out of 7 attention checks. After applying this exclusion criteria, 30 heritage, 39 Rioplatense, and 105 European speakers were included in the analysis (Tables 2 and 3).

Table 2

Demographic and linguistic profile of the monolingual groups.

	Rioplatense Spanish	European Spanish
Mean age in years	26.1 (8.7)	20.4 (5.01)
Place of birth	Buenos Aires	Canarias
Percentage of Spanish use in an average week	90.64 (10.71)	91.52 (10.7)
Level of education reached	44% secondary 54% university 2% advanced	80% secondary 19% university 1% advanced
L2	89% English 2% other 8% no L2	90% English 2% German 8% no L2
Accuracy posttest	99.4% (8)	99% (10.3)

Note. Mean age = the average chronological age of each group. Percentage of Spanish use = self-reported percentage of Spanish use in an average week, standard deviation between parentheses. Maximum level of education = maximum level of education completed at the time of taking the test. L2 = first foreign language learned. Posttest accuracy = accuracy in the Spanish clitic posttest. Standard deviations shown between parentheses.

Table 3

Demographic and linguistic profile of the European heritage group.

	Heritage European Spanish
Mean age in years	36 (11.7)
Percentage of Spanish use in an average week	31.1 (18.3)
Percentage of German use in an average week	65.7% (19.5)
Home language	50% Spanish 50% Spanish and German
Language preference	10% Spanish 53% balanced (no preference) 37% German
Self-rated Spanish proficiency	4.6/5 (0.7)
Age of acquisition of German (years)	63% before 3 30% between 3 and 6 7% after 7
Maximum level of education	 3.3% primary 33.3% secondary 50% university 13.3% advanced
Spanish classes	86.7%
Posttest accuracy	98.5% (12)

Note. Mean age = The average age of each group, standard deviation between parentheses. Percentage of Spanish use in an average week = self-reported percentage of Spanish use, standard deviation between parentheses. Percentage of German use in an average week = self-reported percentage of German use, standard deviation between parentheses. Home language = language(s) used in the home during childhood. Language preference = self-reported preferred language. Self-rated Spanish proficiency = self-rated Spanish proficiency on a scale of 1 (low) to 5 (high). Age of acquisition of German = period in which they started acquiring German. Maximum level of education = maximum level of education completed at the time of taking the test. L2 = first second language learned. Spanish classes = percentage of participants that attended Spanish classes. Posttest accuracy = accuracy in the Spanish clitic posttest.

3.5 *Analysis*

Raw data was preprocessed manually to correct typos, to translate demographic responses from Spanish to English and to grade the clitic posttest. The preprocessed data was exported to R for

analysis (R Core team, 2025). Acceptability data was analyzed using cumulative link mixed models from the *ordinal* package (Christensen, 2023). Two types of analysis were conducted. First, each participant group was analyzed individually in order to properly characterize within-group variation. For each group, 1–7 acceptability ratings were used as a dependent variable and Doubling (non-doubled/doubled) and Case (dative/accusative), as well as their interaction, as independent variables (predictors). Predictors were sum-coded ±0.5 such that the intercept reflected the grand mean across conditions. For Doubling (–0.5 not doubled / +0.5 doubled), a positive coefficient represents higher acceptability in the clitic-doubled conditions. For Case (–0.5 dative / +0.5 accusative), a positive coefficient represents higher acceptability in the accusative conditions.

Additionally, the model of the heritage group included as fixed effects several sociolinguistic factors: the language used at home during childhood (bilingual/Spanish only), the preferred language (balanced/Spanish/German), the use of Spanish in an average week (0%–100%), and the accuracy in the Spanish clitic posttest (0%–100%). The posttest accuracy was included in the analysis to account for potential variability within the heritage group. Spanish use and posttest accuracy were entered into the model centered. Contrasts were sum-coded for home language (–0.5 bilingual / +0.5 Spanish), such that a positive coefficient represents a higher rating in participants who only spoke Spanish at home. For language preference, contrasts were centered treatment-coded, which allowed assessing the effects of the predictors as an average across the three levels of language preference. Thus, the effects of Case and Doubling were estimated for the entire heritage speaker group. When fixed effects interacted, we conducted follow-up pairwise comparisons.

The second analysis directly compared the three groups to address our research questions. Sentences with dative and accusative objects were analyzed separately because our predictions differed between them. The models included acceptability ratings as a dependent variable and Doubling (non-doubled/doubled) and Group (European /Heritage/Rioplatense), as well as their interaction, as independent predictors. The group variable was treatment-coded such that the heritage and Rioplatense groups were compared with the European group. In order to estimate the missing comparison (heritage vs. European), we used the *emmeans* package (Lenth, 2024). The result of this additional comparison is reported in the caption of the tables with model outputs.

A positive coefficient for heritage (or Rioplatense) speakers means that, across conditions, heritage (or Rioplatense) speakers rated clitic-doubled and non-doubled sentences as more acceptable than European speakers. Contrasts for the doubling variable were sum-coded such that the intercept reflected the grand mean across conditions. For Doubling (–0.5 not doubled/+0.5 doubled), a positive coefficient represents a higher acceptability of the clitic-doubled conditions across groups.

Following current guidelines in psycholinguistics, the random effects structure of all models included by-participant and by-item intercepts and slopes for all fixed effects of theoretical interest, i.e., doubling and case (Barr et al., 2013). Non-converging models were simplified following the recommendations in Barr (2013). The final structure of each model is reported in the Results section. We report effect sizes with model coefficients in log odds (β), standard errors (SE), and the z-statistic.

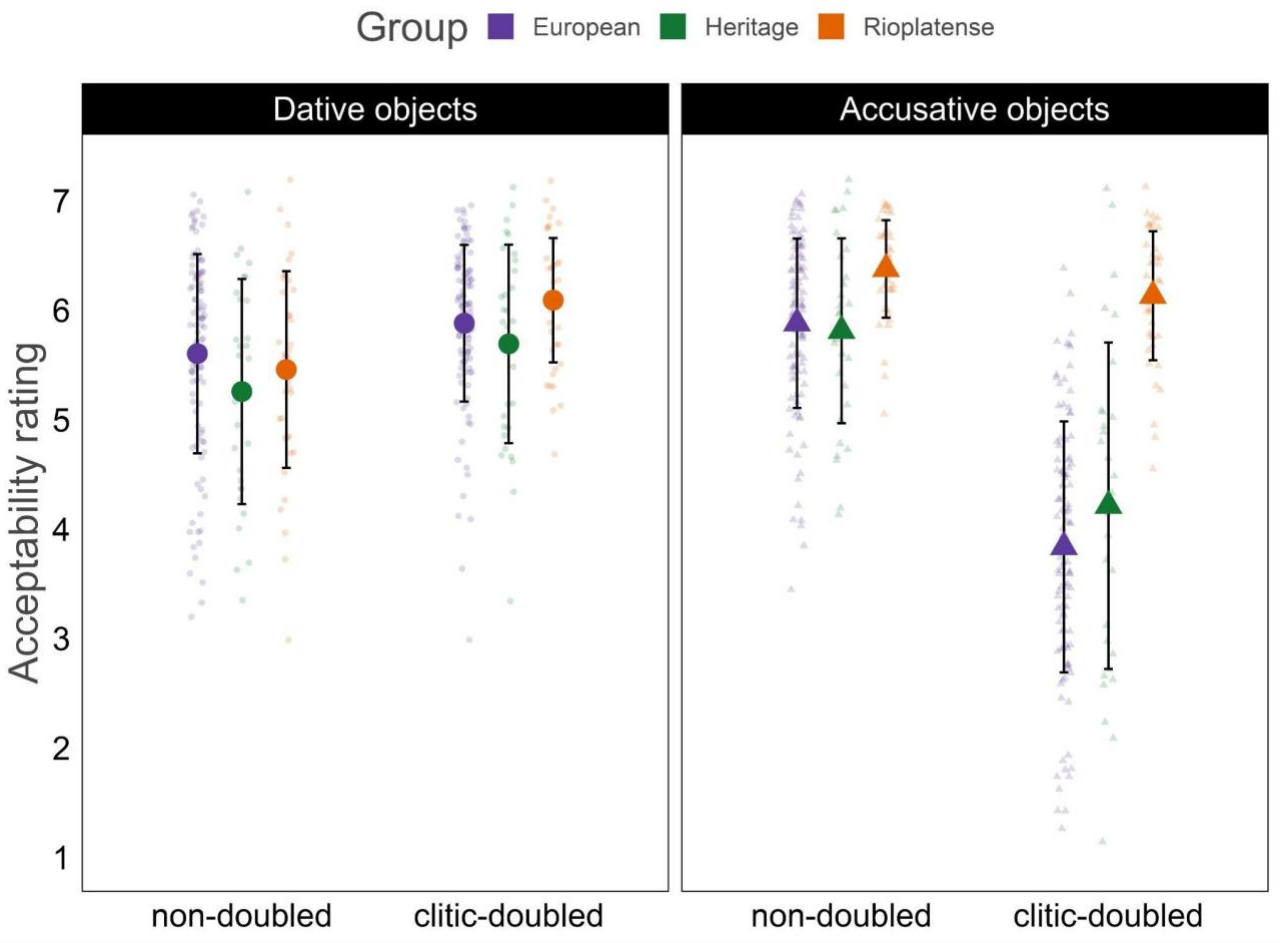
4 Results

4.1 *Individual Group Results*

The three groups performed as expected in the filler items, suggesting that they read the sentences attentively and used the rating scale appropriately (Supplemental Materials 6). Judgments were analyzed if their response times were between 200–8000 milliseconds—we deemed that any response below 200 ms reflected an insufficient listening time, and that any response above 8 seconds reflected internet issues, e.g., connectivity problems. As a result, 2.52% of all the data was excluded. In the experimental items, 2.68% of trials were excluded (European = 2.44%, Rioplatense = 2.64%, Heritage = 3.54%). Performance in the Spanish clitic posttest was very high on average, suggesting that all groups had target-like knowledge of clitics: 98% (SD = 10.3%) European, 98% (SD = 7.9%) Rioplatense, 98% (SD = 13.6%) heritage. Figure 1 shows a descriptive summary of the empirical acceptability ratings of the three speaker groups. The sections below present the results of the individual and between-group analyses. The tables show the full output of the statistical models, while the text only describes the results that were statistically significant.

Figure 1.

Ratings for dative and accusative items in the three speaker groups.



Note. Empirical acceptability ratings of sentences with dative and accusative objects averaged across participants and items (1 ‘completely unacceptable,’ 7 = ‘completely acceptable’). Circles

reflect by-condition averages across participants. Error bars show +/–1 standard deviation. Each smaller point represents by-participant averages in each condition.

4.1.1 Rioplatense Spanish Monolinguals

Overall, Rioplatense Spanish monolinguals rated dative and accusative sentences as more acceptable when they were clitic-doubled than non-doubled (Table 4). They also rated the accusative conditions as more acceptable than the dative conditions. But crucially, there was an interaction between clitic doubling and case: doubling increased acceptability in the dative conditions but not in the accusative conditions, as confirmed by pairwise comparisons (reported in the last two rows of Table 4). Thus, Rioplatense Spanish monolinguals preferred clitic doubling with dative sentences, but they showed no preference with accusative sentences, assigning a high acceptability to both doubled and non-doubled conditions.

Table 4

Output of the statistical model for the Rioplatense Spanish monolingual group.

Coefficient	Estimate	Standard Error	z-value	p-value
Doubling	0.41	0.14	2.82	.005
Case	1.00	0.18	5.44	<.001
Doubling×Case	–1.56	0.27	–5.69	<.001
Doubling:Dative	1.19	0.19	6.32	<.001
Doubling:Accusative	–0.37	0.21	–1.76	.295

Note. Model formula: Rating ~ Doubling * Case + (1 + Doubling + Case | Participant) + (1 + Doubling * Case | Item).

4.1.2 European Spanish Monolinguals

Overall, European Spanish monolinguals rated dative and accusative sentences as less acceptable when they were clitic-doubled than non-doubled (Table 5). They also rated the dative conditions as more acceptable than the accusative conditions. Crucially, there was an interaction between doubling and case: doubling increased acceptability in the dative conditions but decreased it in the accusative conditions, as confirmed by pairwise comparisons (Table 5). Therefore, European monolinguals preferred clitic doubling with dative sentences but dispreferred it with accusative sentences.

Table 5

Output of statistical model for the European Spanish monolingual group.

Coefficient	Estimate	Standard Error	z-value	p-value
Doubling	–1.30	0.11	–11.84	<.001
Case	–1.28	0.11	–11.96	<.001
Doubling×Case	–3.51	0.22	–15.61	<.001
Doubling:Dative	0.45	0.14	3.22	.007
Doubling:Accusative	–3.05	0.17	–17.81	<.001

Note. Model formula: Rating ~ Doubling * Case + (1 + Doubling + Case | Participant) + (1 + Doubling * Case | Item).

4.1.3 European Spanish Heritage Group

Overall, European heritage speakers rated dative and accusative sentences as less acceptable when they were clitic-doubled than non-doubled (Table 6). Crucially, there was an interaction between doubling and case: doubling increased acceptability in the dative conditions but decreased it in the accusative conditions, as confirmed by pairwise comparisons (Table 6). Thus, heritage speakers preferred clitic doubling with dative sentences but dispreferred it with accusative sentences, similarly to the European monolinguals. With regard to the influence of demographic and linguistic variables, there was a three-way interaction between doubling, case, and Spanish use: the asymmetric effect of clitic doubling in sentences with dative vs. accusative objects was larger in speakers who used Spanish more frequently. We also found a three-way interaction between doubling, case, and language preference (balanced vs. Spanish). The interaction indicated that the asymmetric effect of clitic doubling in sentences with dative vs. accusative objects was larger for speakers who preferred using Spanish, as compared to speakers with no language preference. For a visualization of the two three-way interactions, see Supplemental Material 7.

Table 6

Output of the statistical model for the European heritage group.

Coefficient	Estimate	Standard Error	z-value	p-value
Doubling	–0.83	0.34	–2.45	.014
Case	–0.35	0.33	–1.06	.291
Home Language	0.37	0.57	0.65	.517
Spanish use	–0.00	0.02	–0.08	.935
Posttest accuracy	7.40	5.31	1.39	.164

Language preference (balanced vs. Spanish)	2.09	1.16	1.79	.073
Language preference (balanced vs. German)	–0.60	0.56	–1.07	.286
Doubling×Case	–3.99	0.55	–7.30	<.001
Doubling:Dative	1.16	0.43	2.69	.036
Doubling:Accusative	–2.81	0.43	–6.52	<.001
Doubling×Home Language	–0.20	0.39	–0.51	.609
Doubling×Spanish use	0.00	0.01	0.39	.695
Doubling×Posttest Accuracy	1.50	3.56	0.42	.672
Doubling×Preference (balanced vs. Spanish)	–0.21	0.99	–0.21	.833
Doubling×Preference (balanced vs. German)	–0.06	0.38	–0.15	.877
Case×Home Language	0.31	0.37	0.83	.405
Case×Spanish use	–0.01	0.01	–0.75	.455
Case×Posttest Accuracy	3.36	3.30	1.02	.308
Case×Preference (balanced vs. Spanish)	1.02	0.96	1.06	.288
Case×Preference (balanced vs. German)	–0.40	0.37	–1.06	.288
Doubling×Case×Home Language	0.47	0.61	0.77	.442
Doubling×Case×Spanish use	0.07	0.02	3.43	<.001
Doubling×Case×Posttest Accuracy	–7.44	5.29	–1.41	.159
Doubling×Case×Preference (balanced vs. Spanish)	–4.16	1.62	–2.57	.010
Doubling×Case×Preference (balanced vs. German)	0.44	0.62	0.72	.470

Note. Model formula**:** Rating ~ Doubling * Case * (Home Language + Spanish use + Language preference + Posttest Accuracy) + (1 + Doubling + Case | Participant) + (1 + Doubling + Case | Item).

4.2 *Between Group Comparisons*

To compare similarly sized participant groups, we selected a sample of 40 European Spanish monolinguals out of the 115 participants originally tested. The sampling procedure was balanced across the four Latin-square lists, such that 10 participants were selected from each list. Dative and accusative items were analyzed separately because our predictions differed between them.

4.2.1 Dative Clitic Doubling

The between-group comparison showed that Rioplatense monolinguals preferred dative doubling more than European monolinguals (Table 7). There was no evidence of differences between heritage and European monolinguals, or between heritage and Rioplatense monolinguals.

Table 7

Output of the statistical model for dative clitic doubling in the three participant groups.

	Estimate	Standard Error	z-value	p-value
Doubling (European)	0.56	0.19	2.90	.004
European vs. Heritage	–0.14	0.33	–0.42	.675
European vs. Rioplatense	0.15	0.31	0.48	.634
Doubling×Group (Heritage vs. European)	0.20	0.29	0.68	.494
Doubling×Group (Rioplatense vs. European)	0.53	0.27	1.99	.047

Note. Model formula: Rating ~ Doubling * Group + (1 + Doubling | Participant) + (1 + Doubling + Group | Item). The comparison between heritage and Rioplatense speakers—computed separately—did not show evidence that the effect of doubling differed between these groups (β = –0.45, SE = 0.36, z-value = –1.27; p = .804).

4.2.2 Accusative Clitic Doubling

Accusative clitic doubling behavior differed between the Rioplatense and European monolinguals and also between the Rioplatense and heritage speakers (Table 8). Specifically, the dispreference for accusative clitic-doubling was smaller in the Rioplatense monolinguals, as compared to the European monolinguals, resulting in a Doubling*Group interaction. Similarly, the dispreference for accusative clitic-doubling was reduced in Rioplatense vs. heritage speakers. There was no evidence that the effect of doubling differed between heritage and European monolinguals. These results show that heritage and European monolinguals displayed convergent behavior with accusative clitic doubling, and that they dispreferred it compared to Rioplatense monolinguals.

Table 8

Output of the model for accusative clitic doubling in the three participant groups.

	Estimate	Standard Error	z-value	p-value
Doubling (European)	–3.22	0.30	–10.67	<.001
European vs. Heritage	0.35	0.35	0.99	.321
European vs. Rioplatense	2.49	0.34	7.32	<.001
Doubling×Group (Heritage vs. European)	0.53	0.44	1.20	.229
Doubling×Group (Rioplatense vs. European)	2.85	0.42	6.78	<.001

Note. Model formula: Rating ~ Doubling * Group + (1 + Doubling | Participant) + (1 + Doubling + Group | Item). The comparison between heritage and Rioplatense speakers—computed separately—showed evidence that the effect of doubling the dispreference for accusative clitic doubling was reduced in the Rioplatense group (β = –3.31, SE = 0.46, z-value = –7.21; p <.001).

5 General Discussion

We examined the acceptability of dative and accusative clitic doubling in heritage speakers of European Spanish living in Germany. We compared heritage speakers with monolingual speakers of two varieties—European and Rioplatense Spanish—to examine the relationship between heritage behavior and diachronic language change. Based on previous findings, we expected European Spanish monolinguals to reject accusative clitic-doubled sentences and Rioplatense monolinguals to accept them (Rinke et al., 2023). Thus, if heritage speakers reflected patterns of diachronic change, they should accept clitic-doubled accusative objects similarly to monolingual speakers of Rioplatense Spanish, a variety described as more advanced in the diachronic pathway of clitic doubling (Di Tullio et al., 2019; Fischer & Rinke, 2013; Gabriel & Rinke, 2010; Leonetti, 2007). By contrast, if heritage speakers showed a conservative behavior, they should align with European Spanish monolinguals and disprefer accusative clitic doubling—thus providing evidence of having presumably preserved the variety of their caregivers. Finally, we also tested dative clitic doubling, which is grammatical across Spanish varieties. With dative clitic doubling, we did not expect acceptability differences between the three groups, based on the lack of such effects in studies with heritage speakers of Mexican and European Spanish (Irizarri van Suchtelen, 2014; Luján & Parodi, 2001; Montrul, 2004, 2010; Montrul et al., 2015).

The results of the acceptability judgment task showed convergent behavior between monolingual and heritage speakers of European Spanish. Crucially, both groups differed from Rioplatense Spanish monolinguals. Specifically, monolingual and heritage speakers of European Spanish dispreferred clitic-doubled accusative objects over their non-doubled counterparts, while Rioplatense monolinguals accepted doubled and non-doubled accusative objects to similar extents. Meanwhile, all groups preferred clitic-doubling with dative objects, but there were interesting differences in the degree of acceptability. Finally, the behavior of heritage speakers was modulated by their frequency of use of Spanish and language preference. We discuss these findings below.

5.1 *Heritage and Monolingual Speakers Preferred Dative Clitic Doubling*

Our results showed that heritage speakers preferred clitic-doubling with dative objects, and that their behavior was statistically indistinguishable from that of European Spanish monolinguals. This extends previous findings that dative clitic doubling is the preferred structure in monolingual and heritage speakers of Spanish in the United States (Luján & Parodi, 2001; Montrul, 2010; Montrul et al., 2015). A contribution of our study is the use of auditory stimuli. Previous studies have sometimes used written stimuli, but since heritage speakers may struggle reading in their heritage language, this could confound the effects of literacy and linguistic competence (Montrul et al., 2008; Parshina et al., 2020; Polinsky, 2015).

A novel finding was that the preference for dative doubling was stronger in Rioplatense than in European monolinguals. While dative doubling is grammatical in both varieties, our results indicate that it is more widespread in Rioplatense Spanish. This raises the possibility that doubling could eventually become the canonical option in this variety. This aligns with corpus data showing that, while doubling is favored by specificity in European Spanish, no semantic factors affect it in Rioplatense Spanish (Rinke et al., 2020). This provides further evidence that Rioplatense Spanish is at an advanced stage in the diachronic pathway of clitic doubling (Company Company, 2006; Di Tullio et al., 2019; Fischer & Rinke, 2013; Gabriel & Rinke, 2010; Leonetti, 2007; Pujalte & Saab, 2018).

5.2 *Only Rioplatense Monolinguals Accepted Accusative Clitic Doubling*

We found that Rioplatense monolinguals were more accepting of accusative clitic doubling than European monolinguals—6.14 vs. 3.84, respectively. This replicates previous findings from a written acceptability study, which reported that accusative clitic doubling was highly acceptable in Rioplatense Spanish, but not in European Spanish—on average 5.8 vs. 2.6 points on a 7-point scale (Rinke et al., 2023). Interestingly, the acceptability of clitic-doubled accusative sentences in the European monolingual group was numerically higher in our study than in Rinke et al. (2023). This may be due to the use of oral stimuli, as clitic doubling is mostly an oral phenomenon.

Meanwhile, heritage speakers behaved similarly to monolingual speakers of European Spanish and gave relatively low ratings to accusative-doubled objects: on average 4.25 (heritage) and 3.85 (monolinguals) on a 7-point scale. Thus, our findings do not support the hypothesis of innovative behavior in the heritage group. This differs from the findings reported in Hurtado and Montrul (2025), who conducted two acceptability judgement tasks and a priming study with heritage speakers of Mexican Spanish and monolingual speakers of European Spanish. In our study, we added a novel monolingual group—Rioplatense speakers—to diagnose the extent of innovation in the heritage group.

In one of the acceptability studies of Hurtado and Montrul (2025), heritage speakers accepted accusative clitic doubling more than the monolingual group. This differs from our findings, which showed similar behavior in monolingual and heritage speakers of European Spanish. The difference between studies could be due to several reasons. First, it may relate to differences in the demographic profiles of the heritage groups. Participants in our study and Hurtado and Montrul (2025) reported similar frequency of Spanish use (35% vs. 31%). However, the heritage speakers in our study scored similarly to monolingual speakers in the clitic posttest (both around 98%), while heritage speakers in Hurtado and Montrul (2025) showed greater fluency in English than in Spanish, unlike the monolingual group. Moreover, half of our participants reported having the same preference for Spanish and German. A likely cause is that Spanish heritage children living in Germany have free access to formal education as part of a heritage language education program

funded by the Spanish government, or through Spanish language classes in primary and secondary school. By contrast, many heritage speakers in the United States have limited access to formal education in their heritage language (Leal Méndez et al., 2015; Montrul, 2004; Montrul et al., 2015). An increased access to formal education could have resulted in our heritage group having more exposure to Spanish input and thus being more resilient to language change.[2]

With regard to the results of the priming study, we deem our findings compatible with Hurtado and Montrul (2025). Specifically, the priming study of Hurtado and Montrul (2025) showed that monolingual and heritage speakers of Mexican Spanish did not produce accusative clitic doubling in isolation, but that heritage speakers (in contrast to monolingual speakers) were on average 15% more likely to produce such sentences when primed with an accusative clitic-doubled sentence. The results of our study confirm that, in the absence of priming, heritage speakers reject accusative clitic-doubled sentences. This demonstrates that their grammar has not yet incorporated accusative clitic doubling as an option. Meanwhile, the priming results suggest that accusative clitic doubling might one day be incorporated in the heritage grammar, provided that heritage speakers are regularly exposed to sentences with such properties—for example, by being in contact with speakers of Spanish varieties with accusative clitic doubling.

5.3 *Explaining the Lack of Innovative Heritage Behavior with Accusative Clitic Doubling*

This final section speculates on why we did not find a pattern reflecting diachronic change, and we outline directions for future research. We argue that access to formal registers and education, in combination with linguistic properties of doubling constructions, may be worthwhile considering in order to make more fine-grained predictions regarding the extent to which heritage speakers mirror patterns of diachronic change.

The role of access to formal registers and education in a heritage language are potentially relevant factors, because they may affect the occurrence of innovative behavior in heritage speakers. This is underscored by our finding that the acceptability of accusative clitic doubling was modulated by heritage speakers' frequency of use of Spanish and by whether they preferred Spanish to German. The importance of formal education is also highlighted by previous studies. For example, Rinke and Flores (2014) suggested that one of the reasons why heritage speakers of European Portuguese differed from a monolingual group in their knowledge of object clitics was due to little variation in the input, as well as reduced access to formal registers in the heritage language. Moreover, Rothman (2007) found that heritage speakers had limited knowledge of inflected infinitives, a phenomenon mostly acquired through formal education.

Another explanation is that our heritage group did not have enough contact with Spanish varieties that allow for accusative clitic doubling. While we did not record information about exposure, we know that language classes in Germany are only available for Spanish citizens. This would make language contact, at least in formal education, limited to only European Spanish varieties. This differs from the Spanish spoken in the US, which is more diverse, often with multiple

[2] To address this possibility, a reviewer suggested using access to formal education—in terms of participants' reporting having (not) attended Spanish classes—as an additional predictor in the statistical analysis of the heritage group. However, this analysis did not show an effect of access to formal education in acceptability judgments (Supplemental Materials 5). While this does not support the hypothesis that access to formal education promoted conservative behavior in the heritage group, the absence of an effect should be taken with care, because our sample was very homogeneous and the vast majority of heritage speakers had formal education (86.7%, or 26 out of 30 speakers, Table 3). Therefore, it is possible that there was not enough variability in the data to properly test for the effect of formal education.

Spanish varieties spoken in the same city and leading to inter-dialectal language contact (Otheguy & Zentella, 2012). Moreover, Gabriel and Rinke (2010) suggest that Spanish clitic doubling emerges from clitic right dislocation, which has been shown to be more productive in Rioplatense than in European Spanish (Sánchez & Zdrojewski, 2019). Thus, the co-occurrence of limited processing resources (due to lesser language exposure and use) together with contact with doubling structures—as shown by Hurtado and Montrul (2025)—might be needed to trigger innovative behavior in heritage speakers. We need to leave the testing of this possibility to future research, because we did not collect information regarding the Spanish varieties that the heritage speakers had been exposed to. Therefore, we do not know how they might compare to the Canarian Spanish variety spoken by the European monolingual group. This is a limitation of the current study.

Another reason for our finding of conservative behavior in the heritage group could be related to the properties of the grammatical phenomenon tested. Clitic doubling differs from other constructions tested in previous studies, such as inflected infinitives (Rothman, 2007) and object clitics (Rinke & Flores, 2014) in Portuguese. These constructions are acquired relatively late (Costa et al., 2015; Pires et al., 2011), and they rely on formal education and schooling. By contrast, Spanish clitics (and presumably clitic doubling) are learned relatively early: Spanish-speaking monolingual children use clitics consistently by the age of three (Eisenchlas, 2003). The early acquisition age of clitics might explain their robustness to change and might make them less prone to acceleration. Specifically, heritage speakers are likely to have fully acquired clitics and clitic doubling before being exposed to the environmental language, such that reduced input and the dominance shift might affect them less (Tsimpli, 2014). This possibility provides an interesting case for future research, which could directly compare early- and late-acquired phenomena in their susceptibility to progressive behavior in heritage populations.

Overall, our results show that heritage speakers don't always behave innovatively with structures that are undergoing—or have recently undergone—diachronic change. Crucially, this does not invalidate the claim that heritage language variation can mirror patterns of change (Hurtado & Montrul, 2025; Kupisch & Polinsky, 2021; Polinsky & Scontras, 2020; Rinke & Flores, 2014; Rinke et al., 2024; Rothman, 2007). Instead, what our findings show is that the relationship between heritage variation and diachronically innovative behavior may depend on several factors, including the properties of the grammatical structure (e.g., its acquisition timeline) as well as the type of heritage population (e.g., their proficiency and degree of use of the heritage language). We believe that a systematic investigation of these factors is important to better understand the relationship between diachronic change and heritage language variation.

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Competing interests

The authors have no competing interests to declare.

Authors' contributions

Mercedes Martinez Bruera: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data Curation, Writing - Original Draft, Writing - Review & Editing, Project administration. **Daniel Weingärtner**: Writing - Review & Editing. **Andrea Listanti**: Validation, Writing - Review & Editing. **Carolina Gattei**: Resources, Writing - Review & Editing. **Carlos J. Alvarez**: Resources, Writing - Review & Editing. **Horacio Barber**: Resources, Writing - Review & Editing. **Esther Rinke**: Conceptualization, Writing - Review & Editing, Supervision, Funding acquisition. **Sol Lago**: Conceptualization, Formal analysis (supporting), Writing - Review & Editing, Supervision, Funding acquisition.

References

Anagnostopoulou, E. (2016). Clitic doubling and object agreement. In S. Fischer & M. Navarro (Eds.), *Proceedings of the VII Nereus International Workshop* (pp. 11–42). Fachbereich Sprachwissenschaft der Universität Konstanz.

Barr, D. J. (2013). Random effects structure for testing interactions in linear mixed-effects models. *Frontiers in Psychology*, *4*. https://doi.org/10.3389/fpsyg.2013.00328

Barr, D. J., Levy, R., Scheepers, C., & Tily, H. J. (2013). Random effects structure for confirmatory hypothesis testing: Keep it maximal. *Journal of Memory and Language*, *68*(3), 255–278. https://doi.org/10.1016/j.jml.2012.11.001

Boersma, P. (2001). Praat, a system for doing phonetics by computer. *Glot. Int.*, *5*(9), 341–345.

Brehm, L., Jackson, C. N., & Miller, K. L. (2019). Speaker-specific processing of anomalous utterances. *Quarterly Journal of Experimental Psychology*, *72*(4), 764–778. https://doi.org/10.1177/1747021818765547

Bylund, E. (2009). Maturational constraints and first language attrition. *Language Learning*, *59*(3), 687–715. https://doi.org/10.1111/j.1467-9922.2009.00521.x

Christensen, R. (2023). _ordinal-Regression Models for Ordinal Data. R package version 2023.12-4.1. https://CRAN.R-project.org/package=ordinal

Company Company, C. (2006). El objeto indirecto. In C. Company Company (Ed.), *Sintaxis histórica de la lengua española* (Vol. 1, pp. 479–574). Universidad Autónoma de México – Fondo de Cultura Económica.

Costa, J., Fiéis, A., & Lobo, M. (2015). Input variability and late acquisition: Clitic misplacement in European Portuguese. *Lingua*, *161*, 10–26.

Di Tullio, A., Saab, A., & Zdrojewski, P. (2019). Clitic doubling in a doubling world. In A. J. Gallego (Ed.), *Syntactic variation of Spanish dialects* (pp. 215–254). Oxford University Press.

Duffield, N. (2018). *Reflections on psycholinguistic theories: Raiding the inarticulate*. Cambridge University Press.

Eisenchlas, S. (2003). Clitics in child Spanish. *First Language*, *23*(2), 193–211. https://doi.org/10.1177/01427237030232003

Fernández Soriano, O. (1999). El pronombre personal. Formas y distribuciones. Pronombres átonos y tónicos. In I. Bosque & V. Demonte (Eds.), *Gramática descriptiva de la lengua española, 1. Sintaxis básica de las clases de palabras* (pp. 1209–1273). Espasa Calpe.

Fischer, S., & Rinke, E. (2013). Explaining the variability of clitic doubling across Romance: A diachronic account. *Linguistische Berichte (LB)*, *2013*(236), 70–87. https://doi.org/10.46771/2366077500236_4

Flores, C. (2010). The effect of age on language attrition: Evidence from bilingual returnees. *Bilingualism: Language and Cognition*, *13*(4), 533–546. https://doi.org/10.1017/s136672890999054x

Flores, C., & Rinke, E. (2020). The relevance of language-internal variation in predicting heritage language grammars. *Bilingualism: Language and Cognition*, *23*(1), 25–26. https://doi.org/10.1017/S1366728919000464

Gabriel, C., & Rinke, E. (2010). Information packaging and the rise of clitic doubling in the history of Spanish. In G. Ferraresi & R. Lühr (Eds.), *Diachronic studies on information structure. Language acquisition and change* (pp. 63–86). De Gruyter. https://doi.org/10.1515/9783110227475.63

Hudson Kam, C. L., & Newport, E. L. (2005). Regularizing unpredictable variation: The roles of adult and child learners in language formation and change. *Language Learning and Development*, *1*(2), 151–195. https://doi.org/10.1080/15475441.2005.9684215

Hurtado, I., & Montrul, S. (2025). Is structural priming a possible mechanism of language change in heritage language grammars? Some evidence from accusative clitic doubling in Spanish. *Bilingualism: Language and Cognition*, *28*(4), 1–14. https://doi.org/10.1017/S1366728924001032

Ionin, T., & Montrul, S. (2010). The role of L1 transfer in the interpretation of articles with definite plurals in L2 English. *Language Learning*, *60*(4), 877–925. https://doi.org/10.1111/j.1467-9922.2010.00577.x

Irizarri van Suchtelen, P. (2014). Maintained and acquired heritage Spanish in the Netherlands: The case of dative constructions. *Applied Linguistics Review*, *5*(2), 375–400. https://doi.org/10.1515/applirev-2014-0017

Jaeggli, O. A. (1993). Tres cuestiones en el estudio de los clíticos: el caso, los sintagmas nominales reduplicados y las extracciones. In O. Fernández Soriano (Ed.), *Los pronombres átonos* (pp. 141–173). Taurus.

Kupisch, T., & Polinsky, M. (2021). Language history on fast forward: Innovations in heritage languages and diachronic change. *Bilingualism: Language and Cognition*, *25*(1), 1–12. https://doi.org/10.1017/s1366728921000997

Leal Méndez, T., Rothman, J., & Slabakova, R. (2015). Discourse-sensitive clitic-doubled dislocations in heritage Spanish. *Lingua*, *155*, 85–97. https://doi.org/10.1016/j.lingua.2014.01.002

Lenth, R. (2024). Estimated Marginal Means, aka Least-Squares Means. R package version 1.10.5. https://CRAN.R-project.org/package=emmeans

Leonetti, M. (2007). La duplicación pronominal: gramática, semántica y variación lingüística. Ms. Universidad de Alcalá.

Luján, M., & Parodi, C. (2001). Clitic-doubling and the acquisition of agreement in Spanish. In J. Gutiérrez-Rexach & L. Silva-Villar (Eds.), *Current issues in Spanish syntax and semantics* (pp. 193–218). De Gruyter Mouton.

Montrul, S. (2004). Subject and object expression in Spanish heritage speakers: A case of morphosyntactic convergence. *Bilingualism: Language and Cognition*, *7*(2), 125–142. https://doi.org/10.1017/s1366728904001464

Montrul, S. (2010). How similar are adult second language learners and Spanish heritage speakers? Spanish clitics and word order. *Applied Psycholinguistics*, *31*(1), 167–207. https://doi.org/10.1017/s014271640999021x

Montrul, S. (2016). *The acquisition of heritage languages*. Cambridge University Press.

Montrul, S., Bhatt, R., & Girju, R. (2015). Differential object marking in Spanish, Hindi, and Romanian as heritage languages. *Language*, *91*(3), 564–610. https://doi.org/10.1353/lan.2015.0035

Montrul, S., Foote, R., & Perpiñán, S. (2008). Gender agreement in adult second language learners and Spanish heritage speakers: The effects of age and context of acquisition. *Language Learning*, *58*(3), 503–553. https://doi.org/10.1111/j.1467-9922.2008.00449.x

Otheguy, R., & Zentella, A. C. (2012). *Spanish in New York: Language contact, dialectal leveling, and structural continuity*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780199737406.001.0001

Paradis, J. (2023). Sources of individual differences in the dual language development of heritage bilinguals. *Journal of Child Language*, *50*(4), 1–25. https://doi.org/10.1017/s0305000922000708

Parshina, O., Laurinavichyute, A. K., & Sekerina, I. A. (2020). Eye-movement benchmarks in heritage language reading. *Bilingualism: Language and Cognition*, *24*(1), 1–14. https://doi.org/10.1017/s136672892000019x

Pham, G., & Tipton, T. (2018). Internal and external factors that support children's minority first language and English. *Language, Speech, and Hearing Services in Schools*, *49*(3), 595–606. https://doi.org/10.1044/2018_lshss-17-0086

Pires, A., Rothman, J., & Santos, A. L. (2011). L1 acquisition across Portuguese dialects: Modular and interdisciplinary interfaces as sources of explanation. *Lingua*, *121*(4), 605–622.

Polinsky, M. (2015). Heritage languages and their speakers: State of the field, challenges, perspectives for future work, and methodologies. *Zeitschrift für Fremdsprachwissenschaft*, *26*, 7–27.

Polinsky, M., & Scontras, G. (2019). Understanding heritage languages. *Bilingualism: Language and Cognition*, *23*(1), 1–17. https://doi.org/10.1017/s1366728919000245

Pujalte, M., & Saab, A. (2018). Interacciones en el filo oracional medio: doblado de clíticos y movimiento-A. In I. Bosque, S. Costa, & M. Malcuori (Eds.), *Palabras en lluvia minuciosa: veinte visitas a la gramática del español inspiradas por Ángela Di Tullio* (pp. 273–297). Iberoamericana-Vervuert.

R Core Team (2025). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. https://www.R-project.org/

Rinke, E., Elsig, M., & Wieprecht, J. (2020). Clitic doubling in Peninsular and Rioplatense Spanish: A comparative corpus investigation. *Isogloss. Open Journal of Romance Linguistics*, 5. https://doi.org/10.5565/rev/isogloss.83

Rinke, E., & Flores, C. (2014). Morphosyntactic knowledge of clitics by Portuguese heritage bilinguals. *Bilingualism: Language and Cognition*, *17*(4), 681–699. https://doi.org/10.1017/s136672891300076x

Rinke, E., Flores, C., & Barbosa, P. (2018). Null objects in the spontaneous speech of monolingual and bilingual speakers of European Portuguese. *Probus*, *30*(1), 93–119. https://doi.org/10.1515/probus-2017-0004

Rinke, E., Flores, C., Oliveira, P., & Correia, L. (2024). An experimental study on the loss of VS order in monolingual and bilingual speakers of Brazilian Portuguese. *Probus*, *36*(1), 77–112. https://doi.org/10.1515/probus-2024-2006

Rinke, E., Lago, S., & Gattei, C. A. (2023). Diachronic change and variation in use. *Isogloss. Open Journal of Romance Linguistics*, *9*(1), 1–18. https://doi.org/10.5565/rev/isogloss.293

Roberts, I., & Roussou, A. (2003). Syntactic change: A minimalist approach to grammaticalization. Cambridge University Press.

Rothman, J. (2007). Heritage speaker competence differences, language change, and input type: Inflected infinitives in heritage Brazilian Portuguese. *International Journal of Bilingualism*, *11*(4), 359–389. https://doi.org/10.1177/13670069070110040201

Rothman, J. (2009). Understanding the nature and outcomes of early bilingualism: Romance languages as heritage languages. *International Journal of Bilingualism*, *13*(2), 155–163. https://doi.org/10.1177/1367006909339814

Sánchez, L., & Zdrojewski, P. (2019). Dialectal variation in VOS word order in Spanish. In M. Cabrera & J. Camacho (Eds.), *Exploring interfaces* (pp. 268–299). Cambridge University Press.

Sequeros Valle, J., Hoot, B., & Cabrelli, J. (2020). Clitic-doubled left dislocation in heritage Spanish: Judgment versus production data. *Languages*, *5*(4), 47. https://doi.org/10.3390/languages5040047

Sinnemäki, K. (2014). Cognitive processing, language typology, and variation. *Wiley Interdisciplinary Reviews: Cognitive Science*, *5*(4), 477–487.

Shin, N., Cuza, A., & Sánchez, L. (2023). Structured variation, language experience, and crosslinguistic influence shape child heritage speakers' Spanish direct objects. *Bilingualism: Language and Cognition*, *26*(2), 317–329. https://doi.org/10.1017/s1366728922000694

Sorenson Duncan, T., & Paradis, J. (2018). How does maternal education influence the linguistic environment supporting bilingual language development in child second language learners of English? *International Journal of Bilingualism*, *24*(1), 46–61. https://doi.org/10.1177/1367006918768366

Tsimpli, I. M. (2014). Early, late or very late?: Timing acquisition and bilingualism. *Linguistic Approaches to Bilingualism*, *4*(3), 283–313.

Valdés, G. (2001). Heritage language students: Profiles and possibilities. In J. Kreeft Peyton, D. Ranard, & S. McGinnis (Eds.), *Heritage languages in America: Preserving a national resource* (pp. 37–80). The Center for Applied Linguistics and Delta Systems.

Viñas-de-Puig, R. (2019). This is not the case of the indirect object: Linguistic and sociolinguistic factors in double object marking constructions in a contact variety of Spanish from Eastern

North Carolina. *Heritage Language Journal*, *16*(3), 367–382. https://doi.org/10.46538/hlj.16.3.5

Zdrojewski, P. (2013). ¿Por quién doblan los clíticos? *Perspectivas teóricas y experimentales sobre el español de la Argentina. Lingüística Iberoamericana*, *56*, 177–190.

Zdrojewski, P., & Sánchez, L. (2014). Variation in accusative clitic doubling across three Spanish dialects. *Lingua*, *151*, 162–176. https://doi.org/10.1016/j.lingua.2014.08.003

Zehr, J., & Schwarz, F. (2018). PennController for Internet Based Experiments (IBEX). *OSF*. https://doi.org/10.17605/OSF.IO/MD832

Supplemental Materials

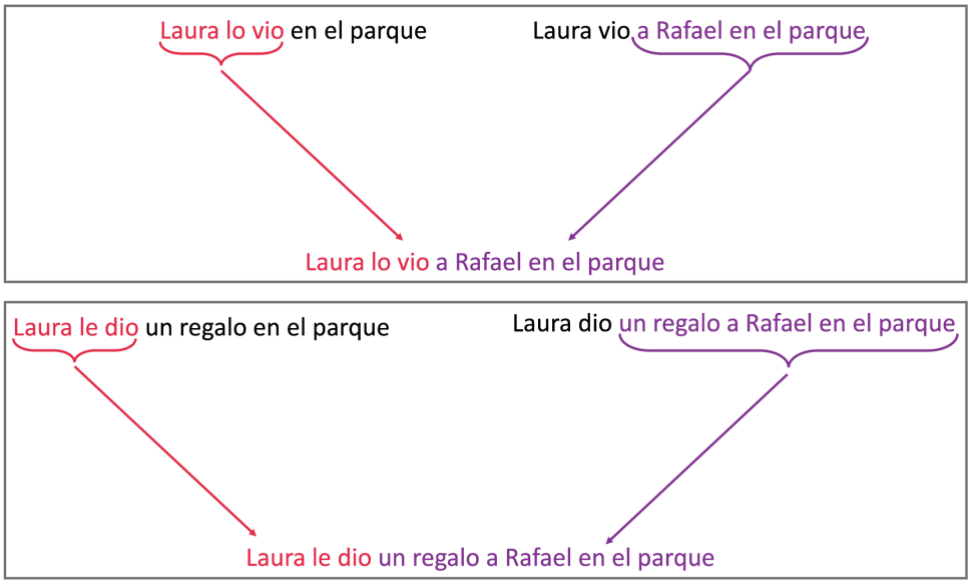
Supplemental material files are included in the repository for this article in the Open Science Framework. They include a detailed explanation of the recording protocol (Supplemental Material 1), the questions for the Spanish clitic posttest (Supplemental Material 2), the demographic and linguistic questionnaires completed by participants (Supplemental Material 3), the results of the clitic posttest (Supplemental Material 4), supplementary analyses for the heritage group (Supplemental Material 5), the results of the filler items (Supplemental Material 6), and further explanations of the effect of demographic variables in the heritage group (Supplemental Material 7). The repository can be accessed at the following link: https://doi.org/10.17605/OSF.IO/NP8RF.

Supplemental material 1. Recording method for experimental materials

The items for the experiment reported in the main manuscript were recorded by two different speakers, one from each variety (Rioplatense and European Spanish), using Praat (Boersma, 2001). In order to avoid co-articulation and to keep prosody comparable across varieties, the stimuli were created using cross-splicing (Schafer, 1997). The procedure involved the production of sentences in a dialogue situation to ensure a naturalistic output. Specifically, the speaker first produced the non-doubled version of the experimental sentences, e.g., "Laura vio a Rafael en el parque", 'Laura saw Rafael at the park'. Next, a second person asked about one of the adverbial phrases in the original sentence. The speaker answered with a sentence that included the clitic but not the doubled object—the clitic was a natural option as the object had already been introduced in the discourse. To create the clitic-doubled condition, the subject, the clitic, and the verb from the answer were combined with the object and adverbial phrases from the original recording (Figure S1.1). This procedure was used to create the dative and accusative sentences. The recorded and cross-spliced versions were deemed natural by two native speakers of each variety.

Figure S1.1

Cross-splicing procedure used to create the experimental items



Note. Procedure to create the experimental stimuli in the doubled conditions. The top panel represents the procedure used to create sentences with accusative doubled objects. The bottom panel represents the procedure used to create sentences with dative doubled objects.

References

Boersma, P. (2001). Praat, a system for doing phonetics by computer. *Glot. Int.*, 5(9), 341-345.

Schafer, A. J. (1997). Prosodic parsing: The role of prosody in sentence comprehension. *University of Massachusetts Amherst*

Supplemental material 2. Spanish posttest

We designed a questionnaire that tested offline knowledge of Spanish clitics. The test did not aim to assess all types of knowledge related to clitics. The test evaluated knowledge of pre- and post- clitic placements (question 1–4), gender agreement (questions 5–6), number agreement (questions 7–8), case agreement (questions 9–10), clitic left dislocation (10–14), object identification (questions 15–16). Each participant saw the questions in the same randomized order. Correct responses are bolded.

PART A. Hacer click en la opción que le resulte más adecuada

Haga click en la opción que le resulte más adecuada.

1. El chef compró los ingredientes y ___ para el evento del domingo.
    - **los cocinó**
    - cocinolos
2. La profesora asignó tarea y estuvo ___ todo el fin de semana.
    - la corrigiendo
    - **corrigiéndola**
3. Paula visitó a sus sobrinos después del viaje y ___ regalos.
    - **les trajo**
    - trajo les
4. La abogada extrañaba mucho a su hijo y quería ___ una carta por su cumpleaños.
    - **mandarle**
    - le mandar
5. La agenda, ___ dejé sobre la mesa.
    - **la**
    - lo
6. A Tomás, __ invitaron a la fiesta de Navidad.
    - **lo**
    - le
    - la
7. A las actrices, ___ contrataron para la nueva película.
    - **las**
    - la
8. Al futbolista, ___ convocaron para el partido.
    - **lo**
    - los
    - le
9. Los libros, ___ devolví a la biblioteca el lunes.

- **los**
- les

10. A mi mamá, ___ regalé flores para su cumpleaños.

    le

    la

11. ¿Recibió el presidente al embajador?
    - **No, al embajador lo recibió el ministro.**
    - No, al embajador recibió el ministro.

12. ¿Buscaron los profesores a los alumnos?
    - **No, a los alumnos los buscaron sus padres.**
    - No, a los alumnos buscaron sus padres.

13. ¿Qué regalaron a Sofía?
    - **A Sofía le regalaron el auto.**
    - A Sofía regalaron el auto.

14. ¿Les dieron el primer premio a los bailarines?
    - **No, a los bailarines les dieron el segundo premio.**
    - No, a los bailarines dieron el segundo premio.

PART B. Reescribir las oraciones

En este ejercicio hay que acortar oraciones. Reescriba como en el ejemplo.

EJEMPLO		
María guardó los juguetes después del recreo	→	*María* **los** *guardó después del recreo*
Pablo habló a los representantes en el congreso	→	*Pablo* **les** *habló en el congreso*

15. Julia entregó el examen en blanco → **Julia lo entregó en blanco**

16. Agustina escribió a su mamá desde el avión → **Agustina le escribió a su mamá**

Supplemental material 3. Linguistic Background Questionnaires

A) Questionnaire used for the monolingual groups

Demographic profile

1. Age:
2. Gender:
    - masculine
    - feminine
    - other
3. Dominant hand:
    - right
    - left
4. Highest completed education level:
    - primary school
    - secondary school
    - university
    - Master's or Ph.D.
5. Vision:
    - normal
    - corrected
    - uncorrected
6. City of Birth:
7. Current location:
8. [European Spanish group only]
   Where did you reside for the first 10 years of your life?
    - in the Canary islands
    - elsewhere in Spain
9. Do you have any language impairment?

Linguistic profile

10. Native language:
    - Spanish
    - Spanish and another
11. Which foreign language did you learn first?:
    - English
    - German
    - Other

- None

12. Do you know any other foreign language?
13. How often do you use Spanish in an average week?: 0% – 100%

B) Questionnaire used for the heritage group

Demographic profile

1. Age:
2. Gender:
    - masculine
    - feminine
    - other
3. Dominant hand:
    - right
    - left
4. Highest completed education level:
    - primary school
    - secondary school
    - university
    - Master's or Ph.D.
5. Vision:
    - normal
    - corrected
    - uncorrected
6. City of Birth:
7. Current location:
8. [European Spanish group only]
   Where did you reside for the first 10 years of your life?
    - in the Canary islands
    - elsewhere in Spain
9. Do you have any language impairment?

Linguistic profile

10. When did you start learning German?:
    - Before 3 years old
    - From 3–6 years old
    - After 6 years old
11. When did you start learning Spanish?:

- Before 3 years old
- From 3–6 years old
- After 6 years old

12. What language did you use at home while growing up?:
    - German
    - Spanish
    - German and Spanish
13. Which whom do you use Spanish nowadays? [select all that apply]
    - Parents
    - Grandparents
    - Sibling
    - Partner
    - Friends
    - Other
14. In general, which language do you prefer to use?
    - German
    - Spanish
    - German and Spanish
15. Have you had Spanish classes?
    - Yes
    - No
16. Have you traveled to any Spanish country?
    - Yes
    - No
17. To which country have you traveled?
18. How long did you travel for?
    - I never traveled
    - Less than 3 months
    - Between 3 and 6 months
    - More than 6 months
19. On a scale of 1–5, how do you rate your knowledge of German/Spanish?
    (1 = I understand but can't speak, 5 = I speak fluently)
20. On a scale of 1–5, how do you rate your knowledge when:
    speaking/reading/understanding/writing in Spanish?
    (1 = I can do it but it is hard, 5 = I have no difficulty)
21. What percentage of the time do you use German / Spanish?
22. What other languages do you know?

- English
- Italian
- Portuguese
- French

Supplemental material 4. Leismo in the European speaker groups

The monolingual and heritage European Spanish groups both showed some presence of leismo in their varieties. This was diagnosed by their responses to two questions in the clitic posttest, questions 6 and 8. These questions required participants to select between two potentially grammatical responses: one that matched leímo and one that matched the etymological use of clitics. For example, item 8 required participants to fill in the gap in the sentence “Al futbolista, ___ convocaron para el partido” and offered “lo”, “los”, and “le” as response options. The choice of option “le” would be consistent with leismo, such that a masculine accusative object would be referred to with a dative clitic instead “le”. On the other hand, the choice of option “lo” would be consistent with an etymological use of clitics, such that the accusative object would be referred to with an accusative clitic. The third response option “los” was grammatically incorrect because it represented a number agreement violation.

8. Al futbolista, ___ convocaron para el partido.

lo

los

le

If leismo were the default option, we would have expected speakers to select the clitic “le” in both questions 6 and 8. To examine this, we quantified the proportion of trials in which participants chose “le” in each of these questions. Choices of the incorrect option were excluded because there was only one case in the entire dataset. The results are shown in Table S4. Both the European monolingual and heritage groups selected the leismo-consistent option less than 50% of the time. This suggests that even if the groups were exposed to leismo, it was not necessarily their default option, and it was comparable between groups. Leismo-consistent responses also seemed to be distributed similarly across questions (Figure S4).

Table S4.

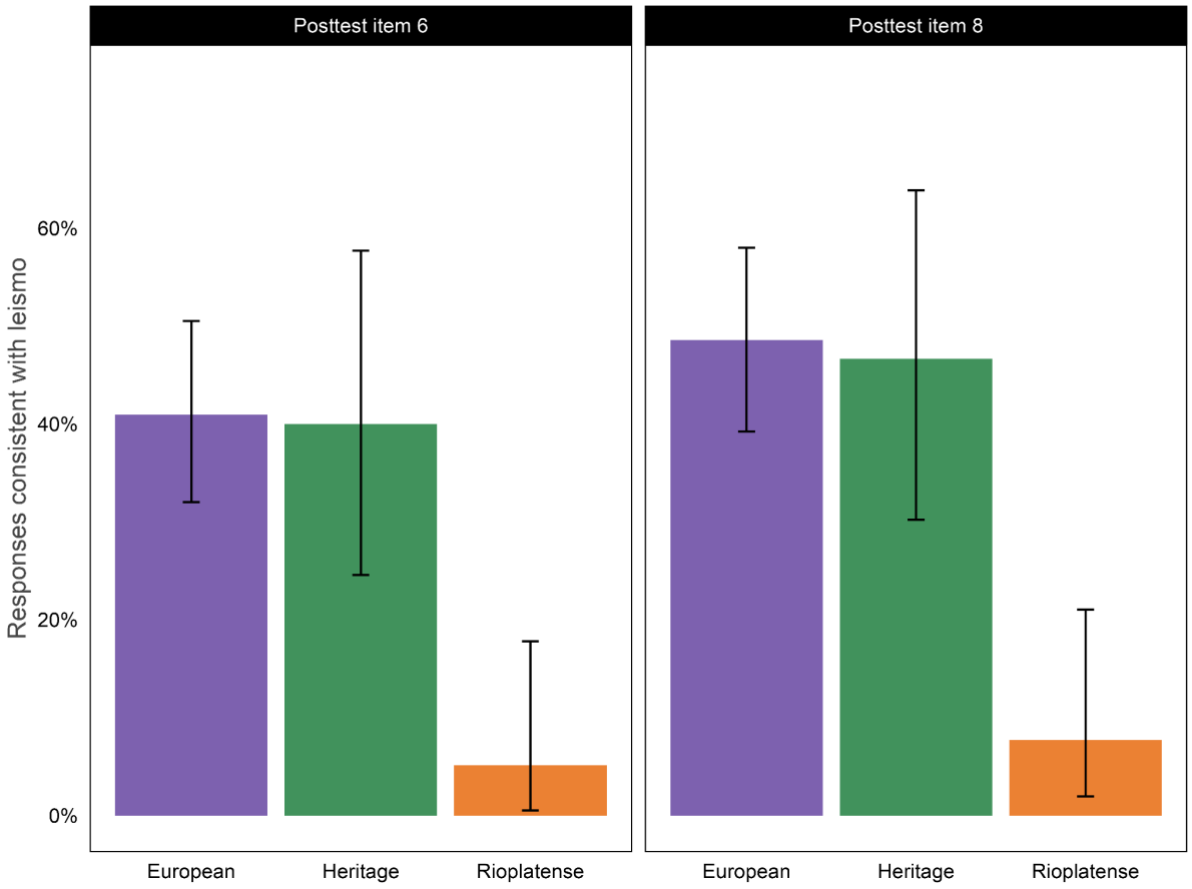
Summary of clitic posttest responses

Group	Etymological responses	Leismo responses
European monolingual	115 (54.8%)	94 (44.8%)
European heritage	34 (56.7%)	26 (43.3%)
Rioplatense	73 (93.6%)	5 (6.41%)

Note. Etymological responses = count of responses matching the etymological use of clitics in questions 6 and 8. Leismo responses = the mean percentage of leismo responses for questions 6 and 8. Percentages out of the total number of responses for each group appear between parentheses. The percentages for the European Portuguese monolingual group don’t add exactly to 100% due to the exclusion of 1 (incorrect) response.

Figure S4

Responses consistent with leismo in the three speaker groups



Note. The bars represent the mean percentage or responses consistent with leismo in the three speaker groups. The error bars represent bootstrapped 95% binomial confidence intervals.

Supplemental material 5. Supplementary analysis of the heritage group

To address a reviewer's suggestion, a supplementary statistical analysis of the acceptability judgments of the heritage group included as an additional predictor whether participants had access or not to formal education (in the form of Spanish classes). Specifically, we explored whether heritage speakers who had access to formal education were more conservative in their behavior, and thus, less likely to accept doubling with accusative objects.

Contrasts were sum coded (–0.5 access to formal education / +0.5 no access to formal education). The results of the supplementary analysis are shown in Table S5, where a positive coefficient represents higher acceptability in participants with access to formal education. The results failed to find any evidence that participants with access to formal education showed lower ratings of sentences with accusative clitic doubling than participants without formal education. While this does not support the hypothesis that access to formal education promoted conservative behavior in the heritage group, the absence of an effect should be taken with care, because our sample was very homogeneous and the vast majority of heritage speakers had formal education (86.7%, or 26 out of 30 speakers, Table 3 in the main manuscript). Therefore, it is likely that there was not enough variability in the data to properly test for the effect of formal education.

Table S5

Output of the supplementary statistical model for the European heritage group

Coefficient	Estimate	Standard Error	z-value	p-value
Doubling	–0.83	0.38	–2.18	.030
Case	–0.50	0.37	–1.34	.180
Home Language	0.14	0.60	0.24	.814
Spanish use	–0.00	0.02	–0.18	.855
Posttest accuracy	7.08	5.22	1.36	.174
Language preference (balanced vs. Spanish)	2.13	1.14	1.86	.062
Language preference (balanced vs. German)	–0.61	0.55	–1.08	.272
Formal education	–0.82	0.78	–1.05	.292
Doubling×Case	–4.49	0.62	–7.21	<.001
Doubling:Dative	1.41	0.49	2.86	.022
Doubling:Accusative	–3.07	0.50	–6.19	<.001
Doubling×Home Language	–0.20	0.41	–0.49	.627
Doubling×Spanish use	0.00	0.01	0.39	.706

Doubling×Posttest Accuracy	1.43	3.55	0.38	.678
Doubling×Preference (balanced vs. Spanish)	–0.17	0.99	–0.17	.863
Doubling×Preference (balanced vs. German)	–0.07	0.38	–0.19	.848
Doubling×Formal education	0.04	0.53	0.80	.954
Case×Home Language	0.23	0.39	0.59	.552
Case×Spanish use	–0.01	0.01	–0.75	.455
Case×Posttest Accuracy	3.36	3.27	1.03	.303
Case×Preference (balanced vs. Spanish)	0.97	0.95	1.03	.305
Case×Preference (balanced vs. German)	–0.38	0.37	–1.02	.308
Case×Formal education	–0.34	0.51	–0.68	.50
Doubling×Case×Home Language	0.17	0.64	0.26	.791
Doubling×Case× Spanish use	0.07	0.02	3.44	<.001
Doubling×Case× Posttest Accuracy	–7.36	5.28	–1.40	.163
Doubling×Case×Preference (balanced vs. Spanish)	–4.01	1.61	–2.48	.012
Doubling×Case×Preference (balanced vs. German)	0.52	0.61	0.84	.398
Doubling×Case× Formal education	–1.42	0.83	–1.71	.087

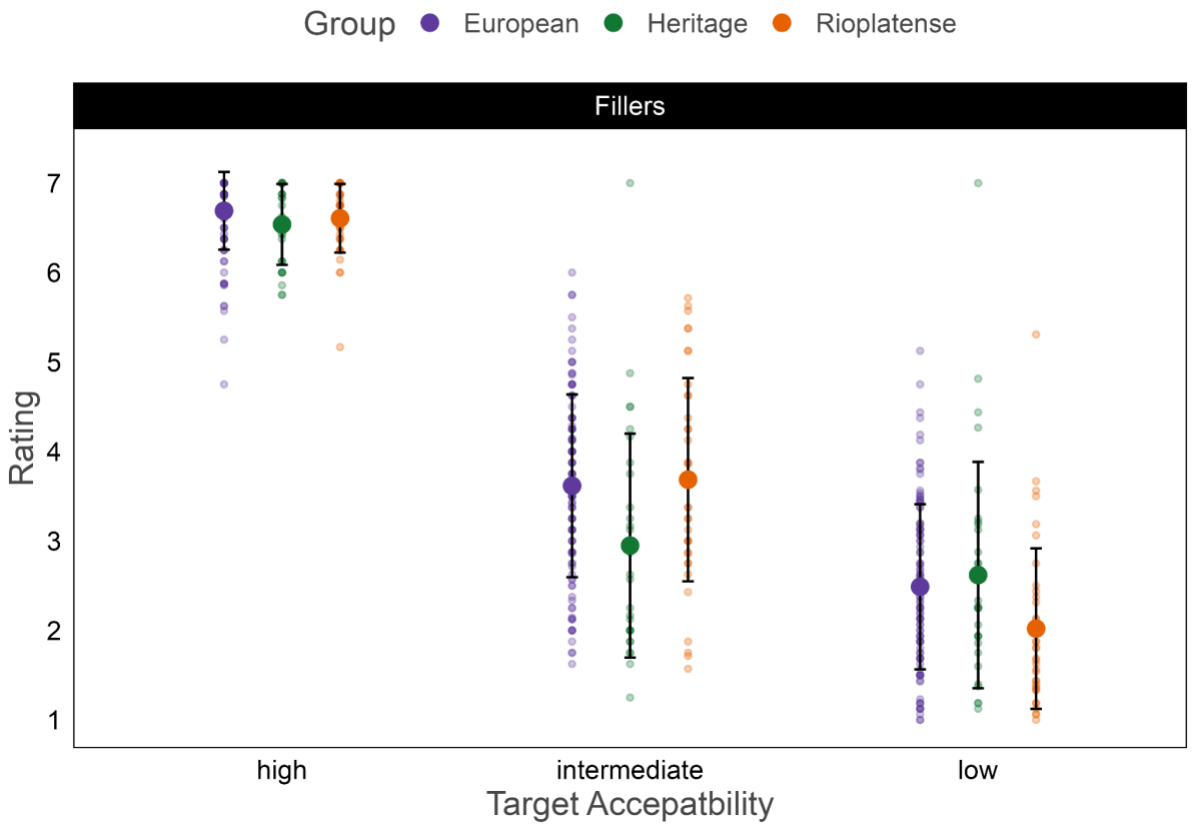
Note. Model formula**:** Rating ~ Doubling * Case * (Home language + Spanish use + Language preference + Posttest Accuracy + Formal education) + (1 + Doubling + Case | Participant) + (1 + Doubling + Case | Item).

Supplemental material 6. Results in the filler items

The three groups performed similarly with the filler items (Figure S4.1). Specifically, they assigned high acceptability ratings to the high acceptability fillers (European heritage: 6.53; European monolingual: 6.69; Rioplatense monolingual: 6.62) and low ratings to the low acceptability fillers (European heritage: 2.62; European monolingual: 2.49; Rioplatense monolingual: 2.01). As expected, the three groups assigned intermediate ratings to the intermediate acceptability fillers (European heritage: 2.94; European monolingual: 3.62; Rioplatense monolingual: 3.69).

Figure S6.1

Ratings for the filler items in the three speaker groups.



Note. Empirical acceptability ratings of sentences in the filler items compared between speaker groups (1 = 'completely unacceptable', 7 = 'completely acceptable'). Circles reflect by-condition averages across participants. Error bars show +/−1 standard deviation. Each smaller point represents the average rating of an individual participant.

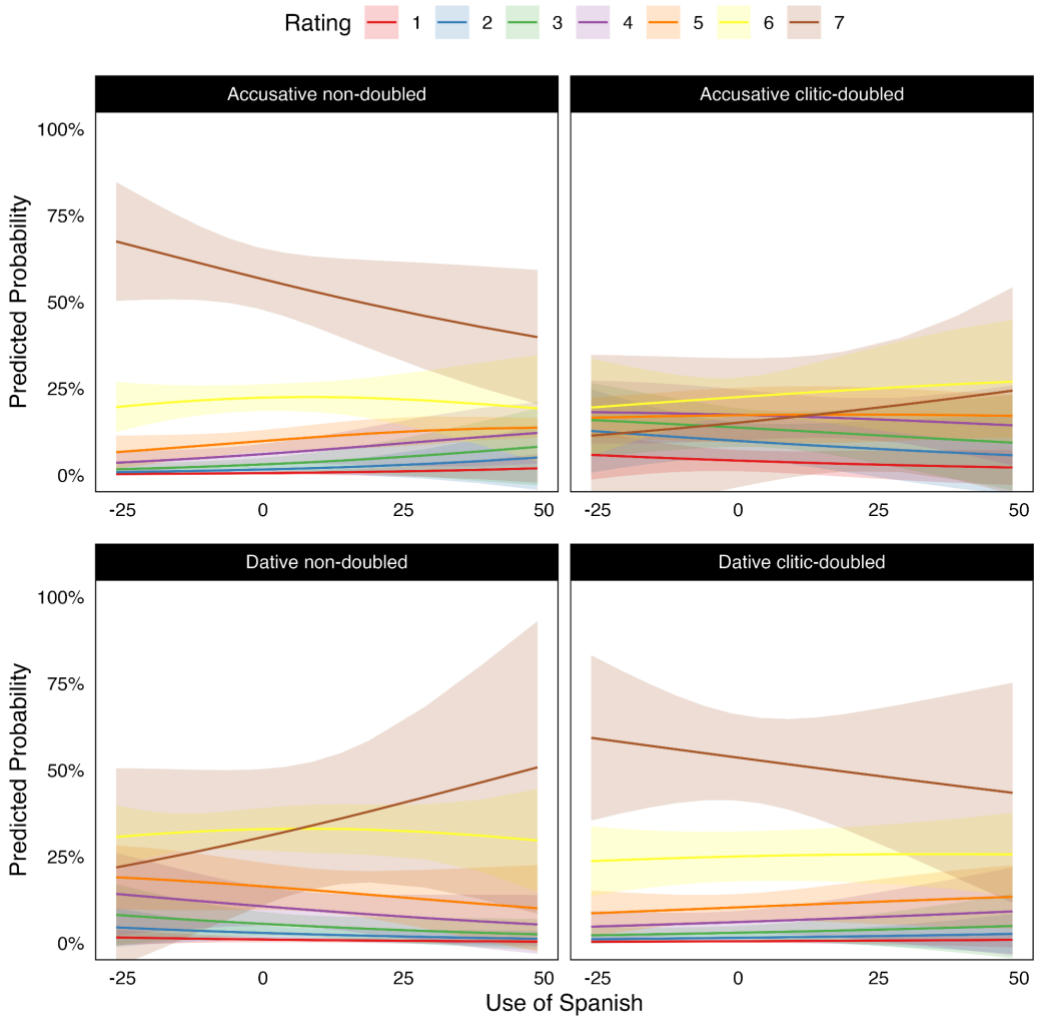
Supplemental material 7. Visualization of the interactions involving demographic and linguistic factors in the heritage group

The results of the statistical analysis of the heritage group showed that there were two demographic and linguistic factors that significantly affected acceptability ratings, resulting in two significant three-way interactions: *doubling×case×spanish use*, and *doubling×case×language preference*. As a reminder, Spanish use was the self-reported percentage of use of Spanish in an average week, while language preference encoded the language preferred by each participant (Spanish, German or both, i.e., balanced).

The interaction *doubling×case×spanish use* indicated that the asymmetric effect of clitic doubling in sentences with dative vs. accusative objects was larger in speakers who used Spanish more frequently. Figure S7.1 shows that in the accusative conditions, more use of Spanish decreased the acceptability of sentences with non-doubled objects, with no clear effect in the doubled conditions. Meanwhile, in the dative conditions, the opposite pattern was attested: more Spanish use increased the acceptability of sentences with non-doubled objects, and decreased the acceptability of sentences with doubled objects.

Figure S7.1

Effects of use of Spanish on the acceptability ratings of the experimental items

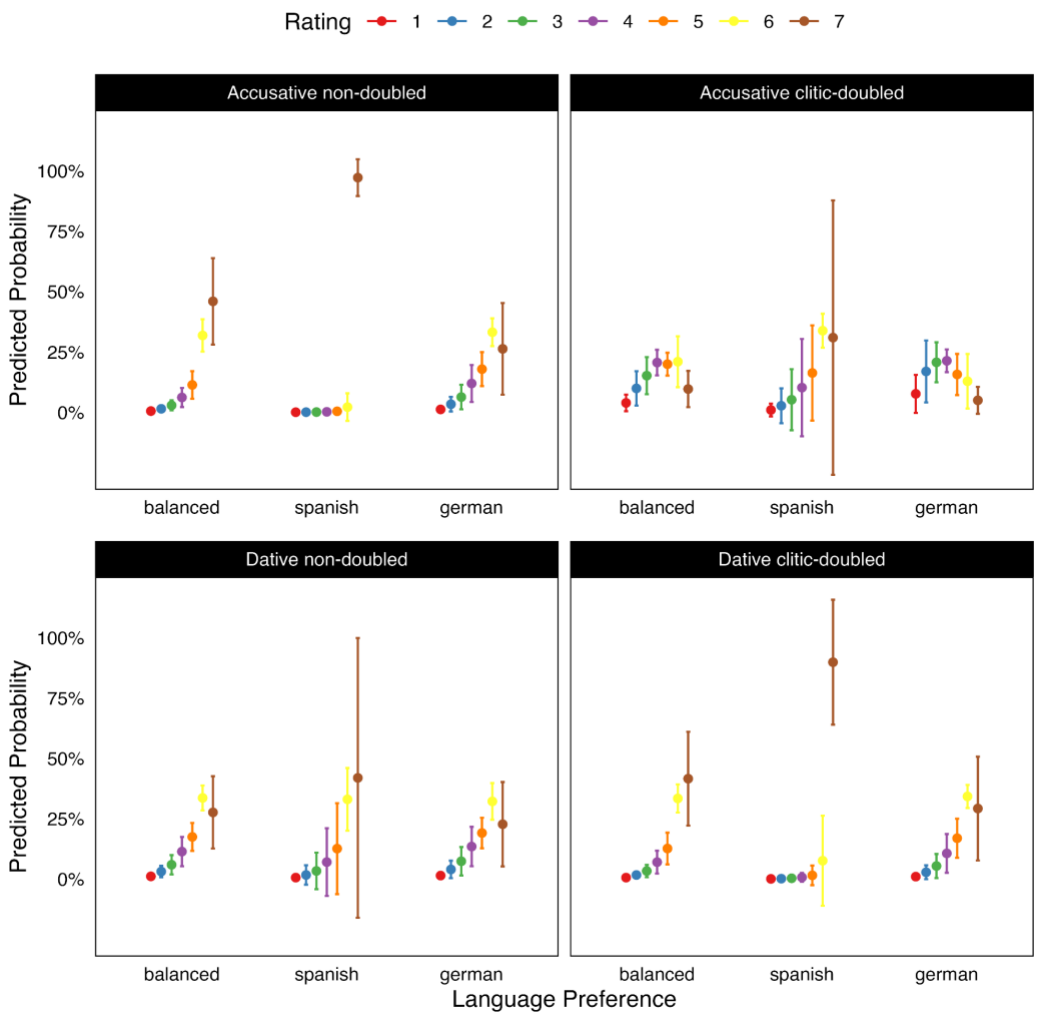


Note. The lines represent the effect of language use at each level of the 1–7 rating scale. The ribbons represent the 95% confidence intervals. The x-axis shows the centered values of the variable *Use of Spanish*: the value zero indicates the average use of Spanish in the sample (ca. 31.2%). Negative values indicate lower values than the average, and positive values indicate higher values than the average.

The interaction *doubling×case×language preference* indicated that the asymmetric effect of clitic doubling in sentences with dative vs. accusative objects was larger for speakers who preferred using Spanish, as compared to speakers with no language preference. This is visualized in Figure S7.2. In the accusative conditions, the preference for sentences with non-doubled accusative objects was stronger in speakers with a preference for Spanish, as compared with speakers with no language preference. In the accusative doubled conditions, speakers with a Spanish preference showed the greatest amount of variability. Meanwhile, in the dative conditions, there was a clear preference for dative doubled objects in speakers with a preference for Spanish (again, as compared with speakers with no language preference), while there was a lot of variability in the non-doubled conditions.

Figure S7.2

Effect of language preference on the acceptability ratings of the experimental items



Note. The points represent the mean probability of occurrence at each level of the 1–7 rating scale. The bars represent the 95% confidence intervals.