Giuditta Smith, Roberta Spelorzi, Antonella Sorace, Maria Garraffa

Chapter 3
Grammatical competence in adult heritage speakers of Italian and adult immigrants: A comparative study

Abstract: The grammar of bilingual children has been shown to be sensitive to linguistic markers for language impairment. These markers can detect similarities and differences between typical bilingual profiles and atypical monolingual profiles in children. In this chapter, we review a study exploring whether the same markers can detect differences in the grammatical patterns of adult bilingual speakers of Italian immersed in an English-speaking environment. Adult immigrants (AI) and heritage speakers (HS) of Italian are bilinguals who are native speakers of a language that is not dominant in their current environment. The study exploits language markers applied to the investigation of language-specific vulnerabilities in Italian children with language impairments, in particular the production of clitic pronouns and the task of sentence repetition. In both tasks, accuracy in HS is significantly worse than that in AI, showing that both linguistic markers are sensitive to a difference between AI and HS grammatical profiles. In sentence repetition both groups show high accuracy; in clitic production HS are considerably more affected than AI. Qualitatively, the markers show similarities, with most produced sentences being grammatically licit in both groups, but also important differences, with HS showing a selective and more severe disadvantage in the use of functional words modifying sentence structure (complementisers, clitics).

Keywords: clitic pronouns, sentence repetition, clinical markers, immigrants, heritage speakers

1 Introduction

Within the bilingual spectrum, heritage speakers are speakers who grew up acquiring a language at home which is different from the language of the larger society, as well as the majority language of the host country (Fishman 2001; Rothman 2009; Benmamoun, Montrul, and Polinsky 2013b, Montrul 2008, 2016). Their age of onset of acquisition of the heritage language is similar to that of monolinguals and they are thus considered native speakers of that language. They can be either

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simultaneous bilinguals, if they are also exposed to the majority language from birth, or successive bilinguals, if contact with the majority language occurs later. Nonetheless, heritage speakers typically experience a shift in dominance with schooling, when the quantity of input and continued language use shifts from the heritage language (HL) to the societal language (Rothman 2009; Kupisch and Rothman 2018).

Shaped by several factors taking place both during the acquisition process and in adulthood, the language competence of these bilinguals on their HL varies considerably and it has become of interest to researchers in all areas of language. One defining factor in childhood is age of first exposure: in grammar, early exposure tends to result in monolingual-like competence at least in some properties of language (Håkansson 1995; Montrul 2010; Montrul et al. 2008; Polinsky 2008). Moreover, heritage speakers who had schooling in the heritage language are generally more aligned to the monolingual standard (Kupisch and Rothman 2018; Dickson et al. 2021). Despite showing differences with the 'gold standard', heritage grammars seem to share qualitative similarities in their grammar with monolingual speakers more so than with another natural comparator, namely (adult) L2 learners. It seems to be the case that the two populations -heritage speakers and L2 learners- can have similar accuracy (quantity- see Bianchi 2012 and Romano 2020 and subsequent work discussed below), but differ in their linguistic patterns, where heritage speakers are more aligned to monolingual standards (quality- Montrul 2010; Romano 2020). Importantly, comparisons between heritage speakers and L2 speakers are also claimed to be influenced by methodological considerations. Specifically, L2 speakers are claimed to show an advantage when metalinguistic knowledge is required, whereas heritage speakers to behave more like the native speakers when online tasks are employed (Bowles 2011; Montrul 2016; Montrul et al. 2008). However, this is no longer the case when heritage speakers have a formal education in the heritage language, suggesting a directly proportional relationship between the level of literacy and metalinguistic knowledge in heritage speakers (Romano and Guijarro-Fuentes, under review).

Given the observation that heritage speakers' profile shares similarities with monolingual native speakers but their attainment of the heritage language is still divergent from 'native' grammars, a recent view in bilingual research is to compare heritage languages to the community providing them with the input, rather than to the 'gold standard' (Benmamoun, Montrul, and Polinsky 2013a, 2013b; Polinsky 2018, D'Alessandro et al. 2021). Typically, heritage speakers learn their heritage language from long-term immigrants living in a country where their native language is not the majority language. To what extent parents' input is determining for the quality of heritage grammars is still discussed due to mixed results (e.g., Cuza et al. 2019; Daskalaki et al. 2020), but there is strong consensus in considering the

variety spoken by long-term immigrants as deviating from the standard variety spoken in the homeland due to heavy exposure to phenomena of crosslinguistic influence (see e.g., Schmid 2011; Polinsky and Scontras 2020 for a review of findings). Crosslinguistic influence is made up of the effects that one language has onto the other, which are described as having one direction, typically from the dominant to the non-dominant language (Yip and Matthews 2000; Paradis 2001; Argyri and Sorace, 2007; Kupisch 2007; Nicoladis 2012). When it is an effect of the dominant, non-native language over the native language, crosslinguistic influence is also referred to as '(first language) attrition' in expats immersed in a dominant language different from their native language, and 'dominant language transfer' (Montrul 2016; Polinsky 2018) in conditions of bilingualism. When the interaction between the two languages starts during acquisition (as is typically the case with heritage speakers) phenomena of dominant language transfer are entangled with that of divergent language attainment (Polinsky and Scontras 2020). Crosslinguistic influence appears very early after immersion in an environment where a language different from the native language is spoken (e.g., Linck et al. 2009) and signs of it are manifested in different domains of language i.e., in the lexicon (Kohnert et al. 1999; Köpke 2002 inter alios), at the syntax-discourse interface (Gürel, 2004; Tsimpli et al. 2004; Tsimpli 2007; Sorace 2005, 2011) and more. In syntax, it has been claimed to be a selective process: pervasive enough to influence some surface phenomena (for example overt subject pronouns: Sorace 2011, Chamorro and Sorace 2019, split intransitivity: Montrul 2004), but not strong enough to modify deep structures that would lead to syntactic violations in the standard language (Cuza 2010, 2013; Domínguez 2009, 2013; Gürel 2002; Iverson 2012). The structures vulnerable to crosslinguistic influence have been identified as those affected by contextual or pragmatic conditions and that show a degree of optionality, namely those at the interfaces between syntax and discourse/pragmatics (split intransitives, double object constructions, focus: Sorace 2011; Sorace and Filiaci 2006; Hulk and Muller 2000; Fenyvesi 2005), or those characterised by a complexity in the syntactic dependencies (Wh-dependencies and silent objects: Cuza and Strik 2012; Laleko and Polinsky 2016; Polinsky 2018). Syntactic operations that are acquired late by the monolingual child seem to be more vulnerable to change in a language contact situation and depending on the age of the bilingual (Montrul 2008; Laleko and Polinsky 2016).

In this chapter, we will concern ourselves with some aspects of grammatical competence in adult bilingual speakers. Apart from the areas of grammar identified as prone to change in attrition, other areas are shown to be particularly vulnerable in heritage grammars, such as inflectional morphology in the verbal domain, gender, and definiteness agreement in the nominal domain (Polinsky 2008 for Russian and Montrul 2008 for Spanish. See Benmanoun, Montrul, and Polinsky 2013b for

a review of findings). The study reviewed in this chapter tests grammatical abilities through two linguistic markers for Italian, namely the production of a specific syntactic construction, namely the clitic pronoun, and a psycholinguistics paradigm used across languages for language assessment, namely sentence repetition. In the next sections we will describe the literature exploring linguistic markers for language impairment in bilingualism as well as some studies exploring grammatical properties of Italian in adult bilinguals, before turning to the data in this study.

2 Bilingualism and markers for language impairment

In some areas of language, an overlap between (typical) bilingual children and atypical children has been identified, creating the need in clinical practitioners to differentiate atypical monolingual and bilingual from typical monolingual and bilingual profiles, as well as opening up important considerations on the concept of language attainment in bilinguals and the 'gold standard'. Exploring the overlap is thus of pivotal importance and is an active area of research (Paradis 2010; Armon-Lotem 2015; Vender et al. 2016; Tuller et al. 2018; Blom et al. 2019; Hamann et al. 2020). At the end of the language development, when a language system has reached its final stage (before decline), early assessment is no longer relevant, but observing the language of adult bilinguals is important to define the pockets of grammatical aspects of bilingual populations requiring attention. Moreover, the areas of language which are vulnerable in conditions of language impairment have been shown to highlight critical areas in typical language profiles with different acquisition as well. Therefore, markers of language impairment in the bilingual speaker can be useful tools to explore the language attainment of healthy heritage individuals.

2.1 Clitic production

The referential system of some Romance languages, including Italian, features clitic pronominals, as in 1. These are pronominal affixes which appear in special dedicated positions that are not available to other pronouns and noun phrases, and that are typically distinct from the argument position (Kayne 1975). In declarative sentences, they usually appear in preverbal position instead of occupying the canonical postverbal object position. Unlike other referring elements, this position is obligatory. In Italian, clitics are morphologically marked for case and gender in

the 3rd person, but not in the 1st and 2nd person. In complex verbs, 3rd person clitics also trigger agreement on the participial, as in 2.

(1) *Il* *bambino* *lo* *bagna*
the child cl.MASC.PL wet.SG
"the child is wetting it/him"

(2) *Il* *bambino* *l(a)'* *ha* *salutata*
The child cl.FEM.SG has greet.PST.F.SG
"the child has greeted her"

In monolingual acquisition of Italian, clitic pronouns make an early appearance in spontaneous speech, with children reported to produce clitics at the age of two and to have a fully-fledged system by the age of four (Guasti 1993/4; Leonini 2006a, 2006b; Guasti et al. 2016). Acquisition follows a systematic process whereby children initially undergo a phase of optional omission of the argument, which creates ungrammatical sentences in Italian in the case of the direct object (DO) (Gianni <la> dà, *Gianni <it> gives*). As production increases, omissions decrease, and they virtually disappear by age 4 (Leonini 2006a, 2006b; Schaeffer 2000). No placement errors are detected in children acquiring Italian, and morphological marking on clitics is in place early, with children performing like adults already at three (Hyams and Schaeffer 2008; Moscati and Tedeschi 2009).

Clitics have qualified as an early marker for Developmental Language Disorders (DLD) in clitic languages (French: Jakubowicz et al. 1998; Hamann et al. 2003; Tuller et al. 2011; Italian: Bortolini et al. 2002, 2006; Arosio et al. 2010, 2014 inter alios). Children with a diagnosis of DLD are significantly less likely to produce the target object clitic (26% of target clitics produced in the DLD group, 96% in the age-matched controls in Bortolini et al. 2002, 2006). Frequent non-target answers contain omissions in younger children (Bortolini et al. 2002, 2006; Leonard and Dispaldro 2013 for Italian, Hamann et al. 2003 for French), and the production of lexical NPs in older participants (Hamann et al. 2003, French, Arosio et al. 2014; Guasti, et al. 2016, Italian) all the way into early adulthood (French, 11;5–20;5, Tuller et al. 2011).

While specifically a marker for clinical conditions, the production of clitic pronouns is a sensitive area in any language system where attainment of syntax differs from standard, both in acquisition and at the end of language development. This is the case for typically-developing bilingual children, where spontaneous production shows a similar pattern to that of monolingual acquisition showing an optional omission stage (Ferrari 2006; Serratrice, Sorace, and Paoli 2004 on bilingual children with a Germanic L1), but productions are lower: the monolinguals in Leonini

(2006a, 2006b) correctly produce around 86% of clitics in expected contexts, while at the same age Vincenzo and Elisa (Ferrari 2006) produce 57% and 59%, respectively. Bilingual children resort to the production of lexical noun phrases more frequently than their monolingual counterparts when their other L1 is a non-clitic language (Paradis 2004; Rogers 2009; White 1996; Belletti and Hamann 2004), and errors on the clitic itself (of gender, number, both gender and number, or case) are more frequent when children come from a clitic L1 (Vender et al. 2016). Errors of misplacement, just like in monolingual typical acquisition, have not been attested in Italian bilinguals, but they have in French (Adiv 1984; Granfeldt and Schlyter 2004). When Italian is learnt as an L2, the supply of clitics in elicited contexts is low (39% of elicited clitics in Leonini and Belletti 2004, 28% in Leonini 2006a, 2006b for children coming from a Germanic L1). Alternative structures include omissions and lexical NPs. In L2 Italian, some studies report placement errors on the clitic (Granfeldt and Schlyter 2004), while others do not (Leonini and Belletti 2004).

2.2 Sentence repetition

Sentence repetition is a psycholinguistics paradigm which has been shown to be sensitive to atypical linguistic profiles including DLD, Autism Spectrum Disorder (ASD), agrammatic aphasia, as well as in typical acquisition (Lust et al. 1996; Friedmann and Grodzinsky 1997; Friedmann 2001, 2007; Friedmann and Lavi 2006; Fattal et al. 2011, Sukenik and Friedmann 2018). Its power as a diagnostic tool lies in the fact that repetition of a sentence is not simple phonological reiteration: repetition of a string that exceeds the word span of an individual has been claimed to be possible because the individual *reconstructs* the stimulus with information from long-term memory, specifically anchoring it to lexical, conceptual, and syntactic representations (Clay 1971, Potter and Lombardi 1990, 1998, Lombardi and Potter 1992). It follows that the paradigm shows a participant's ability to process different grammatical structures.

Riches and colleagues (Riches et al. 2010) designed a sentence repetition task for English targeting different levels of syntactic complexity by combining two factors, namely relative clause type (subject and object) and adjective position (in main clause vs in relative clause) and tested the clinical groups of DLD and ASD with language impairment (ALI), and a typical group of adolescents. Results showed that, while both clinical groups showed higher error rates than the control group, complexity had a more prominent effect in DLD than it did in ALI: participants from the DLD group showed selectively more errors in the more complex structures, and the ALI group showed across-the-board errors. Similar results for the two groups in a sentence repetition task were obtained in Sukenik & Friedmann

(2018) for Hebrew, testing sentences involving different types of syntactic movement. A delayed sentence repetition targeting tense and agreement was carried out for agrammatic aphasia in Friedmann and colleagues for Hebrew (Friedmann and Grodzinsky 1997, Friedmann 1998), which showed that while verbal, adjectival, and nominal agreement are not affected in this population, tense marking is. This subtle distinction allowed for deductions on the nature of the deficit, which, though targeting morphology, lies in the distinction between different inflection operations.

The language of children with DLD has been shown to share some properties with that of sequential/early bilinguals as tested through sentence repetition tasks. In Meir and colleagues (2015), the Russian and Hebrew adaptations of the LITMUS-SRep task (Marinis and Armon-Lotem 2015) were administered to two groups of Russian-Hebrew bilingual children, one with typical development and one with DLD, and two groups of monolingual children for each language. The task tested morphology and syntactic structures of increasing complexity, from active sentences with canonical order to biclausal sentences. SRep tasks in both languages involved grammatical morphology as well as complex syntactic structures reported to be difficult for children with DLD, and sentences were grouped into three levels of complexity specific to each language as determined by state-of-the-art results, from simple sentences with no dependencies to sentences with dependencies. Results showed that sentence repetition was a valuable tool to discriminate children with DLD even among bilingual children. In fact, while bilingual children showed overall lower results than the monolingual typically developing (TD) children, bilingual children with DLD performed significantly worse than their bilingual TD peers. Moreover, distinctions were not only limited to accuracy: sentences with higher complexity were more problematic in DLD than in TD bilinguals, and bilingual children with DLD produced error patterns comparable to those reported for monolingual DLD, and not TD bilinguals. Meir et al.'s results highlight the pivotal role of sentence repetition in the description of different language systems: both accuracy on sentence type and qualitative information given by alternative answer analysis can be informative and show differences between populations.

3 Italian syntactic competence in heritage speakers

Italian has been at the heart of some important investigations on grammar in cross-linguistic influence, particularly in conditions of attrition. Studies from Sorace and colleagues (Tsimpli et al. 2004, Sorace 2011) on Italian long-time expats who were

proficient L2 speakers of English have highlighted several aspects of grammar where their language differs from that of monolinguals living immersed in Italian in the homeland. In Tsimpli et al. (2004), participants were tested with a picture-identification task on the interpretation of the referent of overt and null subject pronouns in contexts of backward (3b) and forward anaphora (3a). Reference assignment varies according to the null or overt nature of the subject, and its position in the clause. In null subject languages like Italian, null subjects (*pro* in the examples below) are the default, non-marked alternative, while overt subject pronouns are marked. When the antecedent is in the following sentence, like in 3a, if the subject is null then coindexation between *pro* and the matrix subject is the default. On the other hand, if the subject is overt, coindexation with the matrix subject is not accepted in the syntax, and the referent is either the object of the matrix clause or a third referent. In 3b, the overt subject pronoun cannot be assigned the same referent as the subject of the matrix sentence while *pro* is ambiguous between coindexation with the subject or the object of the matrix clause.

(3) a. *Quando* $lei_{k/l}$/pro_i *attraversa la strada, l'anziana signora*$_i$ *saluta la ragazza*$_k$.
'When she crosses the street, the old lady greets the girl'
b. *L'anziana signora*$_i$ *saluta la ragazza*$_k$ *quando* $lei_{k/l}$/ pro_i *attraversa la strada*
'The old lady greets the girl when she crosses the street'

Italian (as well as Greek) speakers in the L2 setting showed no effect of attrition on reference assignment when this is governed by structural features (sometimes referred to in the literature as *uninterpretable features*) both of null subjects, as in 3a, and of overt subjects, as in 3b. On the other hand, they significantly differed from the monolinguals in the control group in their interpretation of overt pronouns in 3b, when choice is not governed by syntax. The authors concluded that attrition may affect linguistic phenomena that show optionality due to their collocation at the syntax-pragmatics interface, but not when interpretation does not allow for optionality in the native grammars.

Adult heritage speakers as well as L2 speakers of Italian were tested on their abstract representations of clitics in a structural priming task by Romano (2020, 2021), which focused on three positional differences featuring different verb types (lexical, causative, and modal) as in 4. The sentences are interpreted by the author as being on a scale of complexity, with lexical verbs originating the least complex sentences (with no dependencies), and modals originating the most complex sentences (with dependency and clitic climbing).

(4) a. Modal

i	*pesci,*	*Pietro*	*li*	*vuole*	*cucinare*
the	fish.PL	Pietro	cl.MASC.PL	want.3SG	cook.INF
all' aperto					
at-the open					

"The fish, Pietro wants to cook them outdoors"

b. Causative

i	*pesci,*	*Pietro*	*li*	*fa*	*cucinare*
the	fish.PL	Pietro	cl.MASC.PL	make.3SG	cook.INF
all' aperto	*dalla*	*Zia*			
at-the open	by-the	Aunt			

"The fish, Pietro has them cooked outdoors by the aunt"

c. Lexical

i	*pesci,*	*Pietro*	*li*	*cucina*	*all'aperto*
the	fish.PL	Pietro	cl.MASC.PL	cook.3SG	at the open

"The fish, Pietro cooks them outdoors"

In the structural priming task, participants saw a picture containing a priming sentence that they were instructed to read out loud. Then, they saw a picture with four prompts eliciting the targeted structure and were asked to form a sentence. Participants were speakers of Swedish and Italian living in Sweden. In his studies, Romano finds that heritage speakers were less accurate than the monolingual speakers in the production of a primed clitic pronoun. In terms of accuracy, their performance was similar to that of the L2 speakers. This result was replicated in a truth-value judgement task featuring similar grammatical constructions. Illicit structures produced in the structural priming task contained mostly omissions of the clitic. However, a similarity between heritage speakers and monolingual speakers of Italian was found on the effects of priming: the type of elicited verbal construction influenced the effect of priming in a similar way in heritage speakers and monolingual speakers, with both exhibiting stronger priming effects in lexical and causative constructions over modal constructions. On the other hand, L2 participants exhibit a lexical>causative>modal pattern. The author concludes that while the language of heritage speakers and that of monolingual speakers bears some substantial differences in accuracy and in the number of non-standard productions, abstract representations are qualitatively similar between heritage speakers and monolingual speakers.

The same design was implemented in Romano (this volume) to test attainment of gender in heritage speakers of Italian with dominant Swedish. Gender is intended as both the morphological feature assigning an object or person either masculine or feminine (in Italian), and the syntactic operation of agreement,

whereby e.g., a feminine noun triggers agreement with other constituents of the sentence, such as the determiner and the past participle, as in 5. Lexically, both languages have declension classes, but the Swedish system is opaque, while the Italian one is not.

(5) *La* *bambina* *biond-a*
the.SG.FEM girl.SG.FEM blonde.SG.FEM
"the blonde girl"

In Italian, gender agreement must also appear on the clitic pronoun where, contrary to other types of pronominals like the ones employed in Swedish, it is an uninterpretable feature and is thus reliant on a syntactic operation. Data from the study show heritage speakers to be less proficient in producing clitics whose features correctly agreed with those expressed on the dislocated NP that was their referent, as in 4 above. However, the difficulty did not seem to lie on the operation of gender agreement (namely on the production of the correct features as such): in fact, the most frequent alternative structure produced was the (illicit) omission of the clitic, with only a handful of errors on gender features. The differences in the grammars of heritage speakers and monolingual speakers were replicated in the (timed) truth-value judgement task, but again the gender features of the clitic did not seem to have a role in accuracy, as no statistical significance was found between masculine and feminine clitics.

Adult bilingual speakers were tested on Italian gender also in Bianchi (2012). In this case, the majority language was German. Both Italian and German express lexical gender and gender agreement. While Italian has two lexical genders (feminine and masculine) and these are generally transparent, German has three (neuter) and, like Swedish, the categorisation is less transparent. Both languages show agreement of the features between the noun and the determiner, while Italian also shows agreement on the past participle, as in 6.

(6) *La* *bambina* *è* *andat-a* *al* *parco*
the.SG.FEM girl.SG.FEM is gone.SG.FEM to-the park
"the girl went to the park"

The participants of this study were highly proficient L2 learners of Italian with L1 German (defined as L2-Italian), Italian-German bilinguals living in Italy (defined as 2L1-Italian strong by the author), and Italian-German bilinguals living in Germany (defined as 2L1-Italian weak). The latter group is what we would now refer to as heritage speakers of Italian. In an acceptability judgement task, participants had to repeat or correct a sentence they heard containing an AdjP as well as a clitic. In

7, a masculine NP (*pettine*, comb) does not agree with its determiner and the past participle.

(7) **Ho usato la pettine verde*
pro have.3SG used.PST the.SG.FEM comb.SG.MASC green
e l' ho rimess-a nel cassetto
and cl.SG.FEM have.3SG put-back.PST.SG.FEM in-the drawer
'I used the green comb and I put it back in the drawer.'

In an elicited production task, sentences containing a lexical NP and a clitic matched in gender were elicited. Bianchi found that the heritage speakers of Italian deviated from the target more than the bilinguals living in Italy. Much like in Romano's study (ibidem), the domain of vulnerability in the heritage language was not the operation of gender agreement, but rather the lexical aspect of gender assignment (namely deciding whether an Italian noun was masculine or feminine). Similar results were reported for the L2 group. For the purposes of this discussions, we can conclude that the heritage speakers did not have issues with the syntactic operation of agreement, as is expected from them if syntax is to be considered intact.

In the studies on the syntax of heritage speakers of Italian reviewed above, Italian as a heritage language (at least for speakers of a Germanic language) is shown to share similarities with the Italian acquired as an L2 in adult life, as demonstrated by the fact that heritage speakers are less accurate on some grammatical elements such as gender morphology and clitic pronouns in complex constructions. However, it also shares traits with the Italian spoken in the standard variety in some of its qualitative patterns. Accuracy was mostly vulnerable in surface grammar, as demonstrated by the lower impact on structural operations such as gender assignment, or complex constructions, as demonstrated by the omissions in clitic climbing, whereas structure (or uninterpretable features) seems relatively spared.

4 Current study

An objective of current studies on bilingualism is to give formal descriptions of the languages spoken by (different) bilingual populations in their final state. This is of paramount importance both on theoretical grounds and for differentiating the bilingual language profile from an atypical one. On theoretical grounds, gaining better understanding of what undergoes change in bilingual contexts (and how or to what extent depending on the population) helps us disentangle the phenomenon

of crosslinguistic influence and gives us indications of what to expect from the performance of specific subgroups of bilinguals. Moreover, crosslinguistic influence is proposed to foreshadow diachronic change in a shorter period of time than in monolingual settings, creating a window on what might happen to language over time (Rinke and Flores 2014; Flores and Rinke 2020; Nagy 2016, 2017; D'Alessandro 2021). For clinical purposes, it is important to give clinicians precise indications on what to expect from the language attainment of bilingual populations, should assessments be required later in life due to degenerative conditions or late diagnoses.

As discussed in the previous sections, linguistic markers identified for language disorders, both in the form of language-specific elements such as tense and agreement marking for English or clitics for French and Italian, and in the form of paradigms such as nonword and sentence repetition, may also be vulnerable in typical bilingual populations, although qualitative differences may occur. The purpose of this study is to test whether linguistic markers identified for Italian language disorders, namely the production of clitic pronouns and the task of sentence repetition, are also sensitive to situations of normal bilingualism where Italian is not the dominant language (RQ1). Furthermore, it aims to give further indications on how (Italian) heritage grammars differ from the languages of expat communities (RQ2). Given that these tasks can be vulnerable in conditions of multilingualism, such as in adult L2 learners and successive or sequential bilingual children, we hypothesised that accuracy for the two tasks would highlight differences between heritage speakers and their baseline, with heritage speakers showing lower accuracy on targeted structures (H1). At the same time, the two populations featured in the study are native speakers of the language under investigation. For this reason, the answer patterns of the two populations were predicted to be qualitatively similar, and to not feature structurally illicit sentences (H2).

5 Methods

5.1 Participants

A total of 59 adult participants took part in the study. These were divided in two groups according to whether they were native speakers of one or both the languages in their environment: 30 were native speakers of English and Italian born in the UK from a first-generation Italian family, referred to as heritage speakers (HS), mean age 35 years; 29 were first-generation expat native speakers of Italian, referred to as adult immigrants (AI), with a mean age of 39 years. Only two were the parents of

heritage speakers in our group, although the others shared a similar immigrational background as first-generation immigrants as the other heritage speakers' families of origin.

All participants were living in Scotland at the time of testing and had been living in the UK most of their life (all heritage speakers were born there except two, who had moved before primary school). 26 out of the 29 heritage speakers had both parents who were native speakers of Italian, while the remaining three had one of the two. Literacy in Italian was also consistent in this group, with all participants having had no schooling in Italian. Adult immigrants were also consistent in that they were all native speakers of Italian and were consistently exposed to English only after moving to the UK as adults (>20 years). All AI were formally educated in Italian; however, six of them completed their higher education in the UK. All participants performed a language profile questionnaire, LEAP- Q (Marian, Blumenfeld, and Kaushanskaya 2007) detailing their exposure to both languages throughout their lifetime and at the time of testing. Table 1 summarises measures of the LEAP-Q.

Table 1: Descriptive data for the two groups, Adult Immigrants (AI) and Heritage speakers (HS): mean age in years (and SD), Age of first Exposure to Italian (AoE), level of education, mean years of formal education in Italian (and SD), mean years in the UK (and SD).

	Age (SD)	AoE	Education	Formal education in Italian	Years in the UK
Adult immigrants (n= 29, female 18)	39.31(11.76)	birth	Higher Edu: 29	16.18 (2.50)	15.25 (8.92)
Heritage speakers (n= 30, female 19)	35.7 (12.29)	birth	Secondary: 10, Higher Edu: 20	0.04 (0.19)	35.4 (11.98)

5.2 Materials

All participants completed two background tasks and three experimental tasks.

5.2.1 Background tasks

The background tasks measured participants' competence in comprehension of both Italian and English. For Italian, a reduced online version of the standardised sentence to picture matching task Comprendo (Cecchetto et al. 2012) was adapted on PsychoPy (Peirce et al. 2019) for this study, where accuracy was measured. Upon

hearing a sentence, participants were instructed to press one of two keys (x, n) mirroring two images shown on the screen, depending on which image best represented the sentence. A total of 30 items were selected from the long version from the following categories (six items per category): actives, coordinations, passives, subject relatives, and object relatives. Items were randomized for each participant. Examples of the selected items are given in Table 2.

Table 2: Examples for each type of sentence in the Comprendo task (Cecchetto et al. 2012).

SENTENCE	TYPE
La mamma sta baciando il bambino "The mother is kissing the boy"	Active
Il gatto viene morsicato dal cane "The cat is being bitten by the dog"	Passive
La bambina che tira il cane guarda il bambino "The girl who is pulling the dog is looking at the boy"	Subject Relative
L'uomo che il bambino guarda mangia la torta "The man that the boy is looking at eats the cake"	Object Relative
La bambina mangia la torta, e il bambino beve il latte "The girl is eating the cake, and the boy is drinking milk"	Coordination

Comprehension of English was tested through the standardised task TROG-2 (Bishop 2003). Like the Italian test Comprendo, TROG-2 is a sentence to picture matching task comprising a range of constructions for a total of 80 items. Participants listen to a set of pre-recorded sentences as they watch four images on a computer screen. Each image is labelled a, b, c, or d. Participants are asked to name the letter of the picture the sentence corresponds to. Unlike Comprendo, where items -and consequently the type of sentence- are randomised, the items in TROG-2 are presented in a fixed order of increasing complexity.

Both groups reported high scores in the two background tasks. A mixed effects logistic regression showed that in English comprehension the groups perform differently, with adult immigrants scoring an average 1.49 points less in the English task than heritage speakers. This is to be expected considering that while HSs are native speakers of English, AIs are (proficient) L2 speakers. On the other hand, in the comprehension of the language of testing, namely Italian, the two populations behave similarly, in line with accounts of heritage languages as showing high proficiency in comprehension, measured in comparison with standard tests. Scores on the accuracy for both tests are reported in Table 3.

Table 3: Raw scores (and SDs) for each group in the background tasks Comprendo (Italian) and TROG-2 (English).

	Comprendo correct (SD)	TROG-2 correct (SD)
Adult Immigrants	28.7/30 (0.2)	77.6/80 (2.02)
Heritage Speakers	28.1/30 (0.22)	79.1/80 (0.99)

5.2.2 Experimental tasks

For the purposes of this study, participants were tested on the following language markers for Italian: the production of DO clitics and a sentence repetition task featuring different sentence types.

Participants' processing of Italian sentences was tested through a sentence repetition task developed for Italian (FAST, Di Domenico et al. in preparation). The task is designed to be a quick evaluation of Italian structure processing through a comprehensive list of Italian constructions. The sentences are designed to target structure complexity and/or sentence length, for a total of 26 sentences. The complexity of the structure is determined by whether the item contains a syntactic operation which changes the order of the constituents. Participants are instructed to listen to the sentence read by the researcher and repeat it immediately after. Responses are scored as 1 if the repeated sentence is identical, 0 if it contains an omission or a substitution or if it is not completed. A production was considered a substitution whether it was lexical, namely if a lexical word was substituted with another lexical word (i.e., *papà,* dad > *nonno,* granddad), morphosyntactic, if a morpheme was substituted with another morpheme (i.e., *va*, he/she goes > *vanno*, they go) or a function word was substituted with another function word which changed the structure of the sentence (*la mamma e il nonno*, mum and granddad > *la mamma con il nonno*, mum with granddad). Phonological substitutions that did not change the meaning of the word were disregarded. Sentences are presented in a fixed order. Table 4 gives examples of the items and the corresponding sentence type and locus of difficulty.

Production of DO clitic pronouns was examined through a short version of the elicitation task by Arosio et al. (2014). In the task, participants were shown sets of two pictures involving a character and an animate or inanimate object. In the first picture, a sentence introduced the character of the story and told that he/she wanted to perform an action on the object. In the following picture, participants were asked to answer a question about what the character did. The sentences were recorded by a native speaker of Italian and played through loudspeakers.

Table 4: Examples of the sentences contained in the sentence repetition task, the description of the sentence in terms of length and complexity, and the predicted error.

	Sentence (glossa, translation)							Description	Predicted error
(a)	*Il gatto* the cat.MASC "The cat is black"	è is	nero black. MASC					short sentence, no structural complexity	no predicted error
(b)	*la nonna* The grandma "Grandma is stroking her"	la herCL.FEM.SG	accarezza stroke.1SG					short sentence, structural complexity	no predicted error
(c)	*La mamma* the mum "Mum is watching television, and dad is reading the newspaper"	guarda watch.3SG	la televisione the television	e and	il papà the dad	legge read.3SG	il giornale the newspaper	long sentence, no structural complexity	length
(d)	*il gatto* The cat.MASC.SG "The cat that the dogs are chasing is white"	che that	i cani the dog.MASC.PL	inseguono chase.3PL	è is.3SG	bianco white		long sentence, structural complexity	omission of complementiser, reversibility

(8) Preamble *In questa storia, una signora vuole dipingere una maschera.*
'In this story, a lady wants to paint a mask.'
Probe *Guarda, cosa fa la signora alla maschera?*
'Look, what is the lady doing with the mask?'
Elicited answer ***la*** *dipinge*
pro it.CL.FEM paint.3SG
'she painted it'

The task contained a total of 7 items eliciting the DO clitic. All elicited DO clitics were singular (4 masculine and 3 feminine). All probes elicited a present simple, but answers were felicitous both with a present and with a past tense. Three familiarisation trials were given at the beginning of the session. Because the task was originally adapted following Tedeschi (2009) to also test use of the pragmatic context to determine the correct referential expression to be used (namely the clitic or the R-Expression) (Smith 2021), the 7 items eliciting a clitic were alternated with 7 further items targeting an R-Expression. In these items, the PP was not repeated in the probe and was therefore meant to be treated as new information in the elicited answer. For the purposes of this chapter and given that it would not be expected of healthy adult populations for the NP condition to pose any issue, only data from the clitic condition will be discussed.

5.2.3 Procedure

Each participant was individually tested in a quiet room on the researcher's laptop, or via a Zoom call where the participant was required to be in a quiet room, have a large screen, and a headset or loudspeakers; the experimental protocol was administered in one session lasting about 40 minutes. The clitic task was run on PowerPoint where images in colour were shown, and a recorded voice of a female Italian native speakers from northern Italy played on loudspeakers enunciated the sentences. Sentences for the sentence repetition task were enunciated during testing by the authors, who are native speakers of Italian. Each session was recorded, and all materials were transcribed by the authors. The study was approved by the University of Edinburgh ethics committee (ethics application number 35–1920/4).

6 Results

Accuracy on sentence repetition and clitic production of the two groups is presented in Table 5. Statistical analyses were run in R (R Core Team 2020).

Table 5: Mean raw scores of responses (and SDs) for each group in the experimental tasks of sentence repetition and clitic production.

	Sentence Repetition	DO clitic production
Adults Immigrants	25.8/26 (0.06)	5.6/7 (0.40)
Heritage Speakers	24.8/26 (1.74)	2.5/7 (0.48)

6.1 Sentence repetition

A linear model was run to predict the score in sentence repetition depending on the group. Although statistical significance between the two groups is reached R^2 = .02, F (1,1584) = 37.95, p = .001, with AIs scoring on average 1 point more than HSs, mean accuracy was very high for both groups (≥95%). The distribution of scores visualised through the density plot reported in Figure 1 shows that the AIs' scores are mostly clustered in the highest score (26 in the x axis). HSs' scores are also clustered between 25 and 26, but the distribution is more uneven with several participants also obtaining lower scores.

Next, participants' utterances were analysed for types of errors. Syntactic errors were predicted on the basis of the types of structures featured in each sentence, as shown in Table 4 above. The most common mistakes made by HS were partial or full omissions. Most omissions were of the clitic pronoun, which resulted in an illicit sentence with a dropped object (9). Partial omissions consisted mostly in the dropping the IO clitic in the clitic cluster (10). This sentence is structurally licit.

(9) Target: *la* *mamma* *la* *lava*
the.SG.FEM mum her.CL.FEM wash.3SG
'the mother is washing her'
Produced: **La* *mamma* *lava*
the.SG.FEM mother wash.3SG
'the mother washes'

(10) Target: *Maria* *glielo* *paga*
Maria him.CL.IO-it.CL.DO.MASC pay.3SG
'Maria pays it for him'
Produced: *Maria* *lo* *paga*
Maria it.CL.DO.MASC
'Maria pays it'

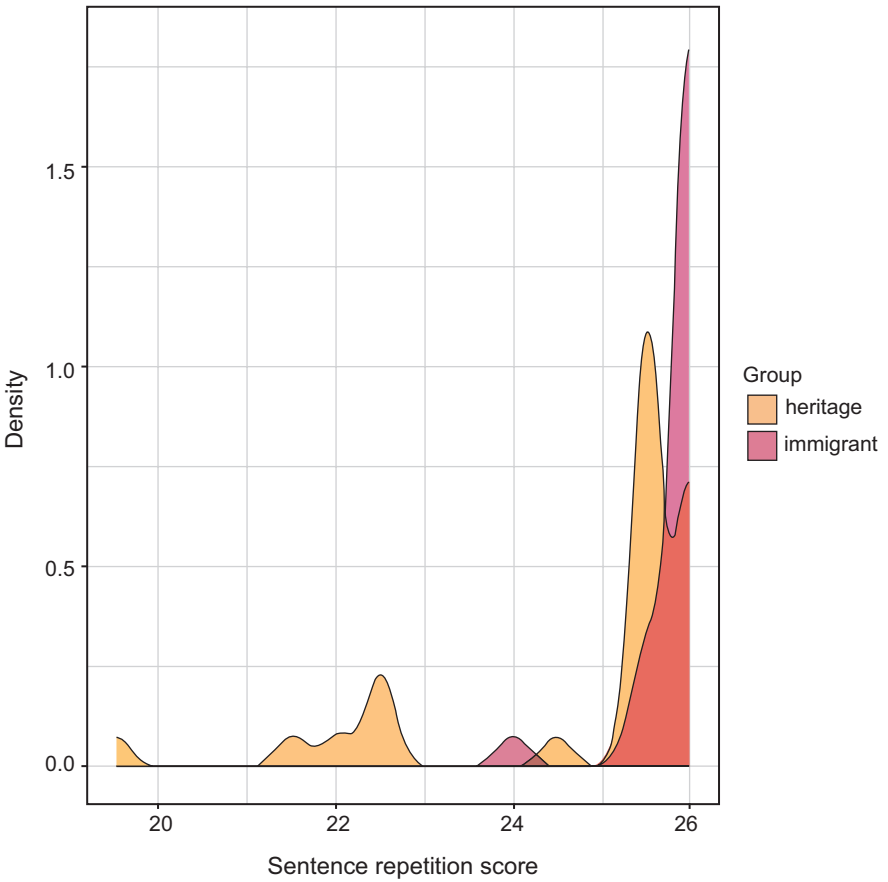

Figure 1: Density plot of the scores on sentence repetition by group.

Another common mistake among HS was the substitution of the complementizer *che* with the coordinating element *e,* which results in transforming a sentence with a dependency, namely a relative clause, into a sentence with no dependency (11), which is still linearly long but does not require building an embedded sentence.

(11) Target: *la nonna guarda il cane **che** la bambina spinge*
'Grandma watches the dog that the child pushes'
Produced: *la nonna guarda il cane **e** la bambina spinge*
'Grandma watches the dog and the child pushes'

Another type of mistake among HS participants was agreement, between the gender of the determiner and that of the noun (12a), and between the NP and the verb (12b):

(12) a. Target: *[. . .] la nonna prepara la*
grandma.FEM prepare.3SG the.SG.FEM
cena
dinner.FEM
'grandma prepares dinner'

Produced: **[. . .] la nonna prepara il*
the.SG.FEM grandma.FEM prepare.3SG the.SG.MASC
cena
dinner.FEM
'grandma prepares dinner'

b. Target: *il gatto che il cane*
The.SG.MASC cat.SG that the.SG.MASC dog.SG
insegue
follow.3SG
'the cat that the dog is following'

Produced: **il gatto che il cane*
the.SG.MASC cat.SG that the SG.MASC dog.SG
inseguono
follow.3PL
'the cat that the dog are following'

The very few errors made by AIs were lexical omissions (e.g., of an adjective or PP, which maintain the sentence licit) or lexical substitutions.

6.2 DO clitic production

Mean accuracy in production or 3rd person DO clitics is visualized in Figure 2 below. A binomial mixed effects logistic regression was run where Score was predicted by the fixed effect of group, type (clitics, R-expression), and their interaction, with random intercept and slope for type by subject and random intercept by item. The linear effect of group was significant, z = 2.06, p = .04, type had an effect where object clitics are significantly harder than R-expressions, z = -3.87, p < .001, and there is a significant interaction between group and type z = 2.49, p = .01. In the clitic condition, HSs perform considerably lower than AIs. 61% of the time, HSs produce NPs in place of the elicited clitic. Whilst not the target answer, this answer is struc-

turally licit. Only 13 answers (4%) contain a clitic with a feature error (namely the wrong gender or number) or the wrong argument error (namely IO in place of DO), and 9 (3%) contain the use of the full pronoun, and only six omissions were reported. In the same condition, AIs produce a lexical NP 23% of the time. In the lexical NP condition, in all cases in which AIs do not produce the target lexical NP (14% of the time) they produce the corresponding (correct) clitic. The same is true for most alternative answers provided by HSs (7%), save for 3 irrelevant answers.

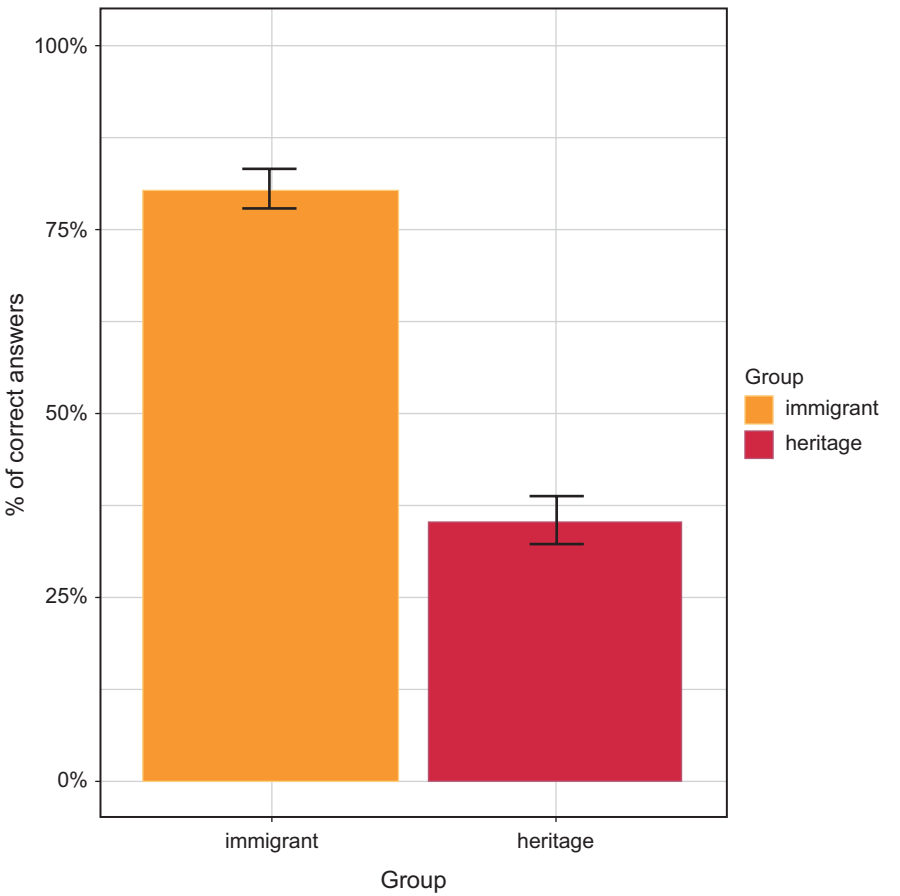

Figure 2: Bar plot representing percentage of correct answers on production of DO clitic by group.

7 Discussion

Background measures on comprehension of both simple and complex sentences in Italian showed that both Heritage speakers of Italian and Adults immigrants have high accuracy in the language non dominant in their environment. Thus, abstract representations of Italian grammar in heritage speakers seem to be similar to those of speakers of Italian who were raised in an Italian-dominant environment, as they resemble both the performance of their (bilingual) baseline, and the adult monolinguals (Cecchetto et al. 2012).

Regarding our first research question (RQ1), investigating whether language markers identified for Italian language disorders are sensitive to bilingual grammars in adulthood, data from the experimental tasks show that the two markers tested in this study are informative on the language of the two populations and the differences that occur between them. These markers, testing computation during production of Italian and production of a specific construction which is not present in the dominant language, both highlight a difference in the grammars of heritage speakers and their baseline. H1, predicting a difference between accuracy of the two groups, is borne out, as is the predicted direction: in both tasks, HS are significantly less accurate than their baseline. This is true of both sentence repetition and clitic production, but it is particularly relevant for the latter. In sentence repetition, in fact, both groups perform correctly in ≥95% of the cases, and therefore the statistical difference may be considered negligible (Brown 1973); in elicited production of the clitic pronoun the difference is wider: AIs have high accuracy (around 85%) on this element which is learnt early in typical monolingual development and is employed with a strong preference over any other referring expression in Italian, while HSs do not (around 35%). This result is in line with the other studies on production of primed clitics reviewed before (Romano 2020, 2021). Interestingly, while productions of clitics are low in HSs, these are produced roughly 1/3 of the time they are elicited. This may be the case because they are highly available in their input language. In fact, when these are not as highly accessible in the input language, as was shown to be the case for double object clitics, productions in HSs are either much lower or completely absent (Spelorzi et al. 2022).

The fact that differences would emerge in the production tasks but not in the comprehension task is in line with some results on heritage syntax in different modalities, where even when a structure was generally absent in the spoken language of heritage speakers, abstract knowledge of the same structure was present as tested through comprehension tasks (for example comprehension of

German passive constructions in heritage speakers of a dialect of German spoken in Kansas, Putnam and Salmons 2013). Similarly, the fact that the most severe detachment of heritage grammar from standard Italian is noticeable in the elicitation task rather than in the sentence repetition task (where clitics were also featured) could be dependent on the task, which allows speakers for more freedom in the choice of structure than a repetition task.

To answer the second research question of this study (RQ2), investigating how (Italian) heritage grammars differ from the grammars of Italian expat communities, we looked at answer patterns. As we have anticipated, while most AIs produce clitics in some if not all the items eliciting clitics, the large majority of HSs *always* produces lexical NPs. The production of the construction containing this type of pronoun is thus preferred in adult immigrants over the production of (another pronoun or) a lexical NP when the context calls for it, but it is dispreferred in heritage speakers in the same contexts. Nonetheless, structural errors are few in heritage speakers, and none in adult immigrants. In the elicitation task, errors of illicit omissions and misplacements are not recorded, and just a few illicit omissions are recorded in the sentence repetition task. Similarly, few assignment errors were found (of gender and/or number) in both tasks. Another, similar mistake that the heritage speakers sometimes make is substituting the complementiser *che* with the coordinating element *e*. Both phenomena indicate structure simplification. In fact, sentences containing a clitic structurally require a movement operation which results in non-canonical argument order in the linear structure, as well as requiring other operations such as agreement. When the participant either produces a structure that both maintains the canonical order and requires no further operations -namely the production of a lexical NP- or, when avoidance is noy an option due to the task requirements, drops the clitic, they are constructing a simpler sentence. Similarly, substitution of the complementiser *che* for *e* takes the structure from one with a dependency to one with no dependency. H2, in which we hypothesised that the quality of the grammar of the two populations was similar, is partially borne out: the syntax of both heritage speakers and adult immigrants is (mostly) canonical; however, while adult immigrants make no structural mistakes, heritage speakers are particularly vulnerable in the production of clitics, an issue which is resolved through the use of a lexical NP in the elicitation task, creating a licit sentence, but with partial or total omissions of the clitic in the sentence repetition task. Taken together, these results suggest that while core syntax is overall in place both in abstract comprehension and in production in heritage speakers, sentence complexity may play a role in answer strategies, and higher complexity can lead to errors on core syntax as well.

8 Conclusions

In this study, heritage speakers of Italian who grew up bilingual and are immersed in an environment where Italian is not the dominant language were compared to expat Italian speakers who grew up monolingual Italian and were later immersed in the same environment. Their grammars have been investigated in areas of language reported as vulnerable in both late and early second language learners and atypical populations. A difference between the two groups emerged in accuracy, with adult immigrants reporting a more consistent use of clitic pronouns and no mistakes in sentence repetition, and heritage speakers showing little use of clitic pronouns favouring lexical NPs instead, and a higher number of mistakes in sentence repetition. Qualitatively, adult immigrants produced no structural or morphosyntactic errors across tasks. Lower competence in specific grammatical computations was evident in the heritage group. While they resorted to licit alternative structures in most cases, some non-canonical sentences were produced, particularly in sentence repetition on sentences featuring clitics, complementisers, and gender agreement operations.

Taken together, the data presented support the idea that the bilingual experience leads to a continuous process of language change. Bilingual speakers who learn a language from a population of native speakers outside of their homeland seemingly acquire a language that shows changes even from the language of their input. This is not only evident at the interface between linguistic modules, but also in specific areas of grammar such as pronominal clitics or complex sentences featuring, in the present case, complementisers. This result goes in the direction of showing that differences can also be found in structural language. Importantly, heritage speakers only produced illicit sentences in SR but not in the elicitation task, suggesting that, when allowed to create novel sentences using their preferred grammars, structural rules of the target language are followed, and changes in the language from a potentially attrited population to a heritage one may be more in terms of preference.

More studies on different bilingual experiences are required to better understand factors that modulate the grammatical competence of speakers with different opportunities to practice the language. These studies are pivotal to understanding the phenomena at the core of language change in both bilingual and monolingual settings.

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