

# GENDER IN L2 AND HERITAGE ITALIAN BY SWEDISH AND SPANISH DOMINANT SPEAKERS

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## 1. INTRODUCTION

L2 speakers of Italian (L2Ss) acquire gender relatively easily (Chini & Ferraris, 2006). Studies of the Pavia corpus in Italy concluded that both the assignment of masculine (MASC) and feminine (FEM) gender to a noun as well as gender agreement or concord between the marked noun and other coreferents (e.g., adjectives, articles, and pronouns) do not pose particular difficulty to the L2 learner, especially if the acquisition of more canonical, productive gender forms ending in *-o* (MASC) or *-a* (FEM) and more frequent classes such as articles and pronouns are considered.

In contrast, L2Ss of Spanish are known to persistently attain non-target-like knowledge of gender features. For instance, studies of the production and comprehension of gender marking in noun – adjective concord, determiner – noun – adjective, and noun – clitic agreement have shown L2Ss to consistently diverge from native speakers (Franceschina, 2005; McCarthy, 2008; Grüter *et al.*, 2012; Faber, 2017 among others). Moreover, these studies have robustly attested for masculine gender acting as a default gender marker insofar as it typically overextends to feminine contexts requiring ending in *-a* (\*el.MASC mes-*a*.FEM → la.FEM mes-*a*.FEM) rather than the opposite pattern (\*la.FEM coche.MASC → el.MASC coche.MASC) (Faber, 2017; McCarthy, 2008 among others). However, the L1 tested in these studies was English, a language which does not mark grammatical gender, which points to possible interference from the native language, in contrast to the studies conducted in Pavia which were run with L1 speakers of typologically distant languages from Italian. Even the processing of lexical gender assignment has been shown to be characterised by high variability and instability (Hopp, 2013, 2016). Likewise, heritage language speakers (HLSs) have been found to diverge from monolinguals, showing similar patterns to L2Ss for the overextension of masculine forms in both production and comprehension (Montrul, Potowski, 2007; Alarcón, 2020; Montrul *et al.*, 2013; Cuza, Pérez-Tattam, 2016; Martínez-Nieto, Restrepo, 2021). The similarity between L2 and HLSs calls into question the role of early exposure and argues against a critical period for the acquisition of an L2 or heritage language. Given that HLSs receive comparatively larger amounts of naturalistic, rough-tuned input at much earlier ages than L2Ss, one would expect these speakers to perform in a more target-like manner, contrary to fact. In the present study, therefore, we take up this issue by comparing HLSs to L2Ss but we do so in an understudied language with a highly similar gender system to Spanish, Italian.

In the context of the acquisition of gender marking, to the best of our knowledge, very few studies have been conducted to explore the effects of typological similarity, also

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known as typological distance even though it correlates with learning difficulties and pace (Giacalone-Ramat, 2012: 1). The purpose of this study is, therefore, to examine the effects of age of exposure and typological similarity in the acquisition of gender. To this effect, heritage and L2Ss of Italian dominant in either Spanish or Swedish were compared to Italian monolinguals on a production and grammaticality judgment task. In this context, Spanish and Swedish differ significantly for typological similarity to Italian given only the former language involves a gender system compatible with Italian.

## 2. TYPOLOGICAL SIMILARITY

The degree of similarity between two or more languages known by the bi/multilingual in terms of structural properties or other linguistic characteristics is referred to as typological similarity, typological distance, language similarity, and language proximity (Foote, 2009; Giacalone-Ramat, 2012; Lee, 2022; Leivada *et al.*, 2021; Putnam *et al.*, 2018; Westergaard *et al.*, 2017). Language distance, for instance, is introduced in Leivada *et al.* (2025: 2):

Almost all theories about the bilingual mind rely on one important yet unclear assumption: *language distance* (also referred to as *language similarity* or *proximity* in the literature) affects processing and modulates the degree of recruitment of cognitive control mechanisms... According to models of bilingual lexical access (e.g., BIA/BIA+; 24), increased lexical form similarity yields higher levels of activation for two words in the mental lexicon.... According to the Language Distance Hypothesis, unshared grammatical properties pose a challenge for native-like syntactic processing, predicting differences for bilinguals whose languages are separated by a greater degree of grammatical differences... At the phonological level too, languages that have non-overlapping inventories show a greater degree of separation.

Two languages can be typologically similar for their phonology, morphology, syntax, and semantics, for instance, if properties in one language show partial or complete overlap with the other. Italian and Spanish may be considered more typologically similar than Italian and Dutch owing to a larger degree of overlap between Italian and Spanish, both Romance languages, in comparison to Dutch, a Germanic language. The overlap, can be considered, in relation to phonology (e.g., isomorphic morphophonological cues to person, number, and gender marking on articles, adjectives, pronouns, and nouns in the input in Spanish and Italian but not Dutch), morphology (e.g., high number of inflectional endings in Spanish and Italian in contrast to Dutch across the tense, voice, mood verbal system), syntax (e.g., both are not V2 languages, allow null subjects and VS orders), and the lexicon (e.g., wide number of lexical cognates of Latin origin).

A natural prediction following from typological similarity is that the acquisition of a similar L2 should be easier than a different one. Research on this topic, however, has shown this is not always the case, no matter how straightforward or transparent the correspondence for a given structural property between L1 and L2<sup>3</sup>. Serratrice *et al.* (2012) examined whether typological similarity helps bilingual children map the Italian contrast between preverbal and postverbal clitic pronouns in [±focus] contexts in Italian. They tested three child groups: English-Italian bilinguals, Spanish-Italian bilinguals and Italian

<sup>3</sup> One problem with many studies in this field is that while structural correspondence is not necessarily a fact in generally similar or closely related languages, there can be many instances of structural similarity in languages that are not “close” at all.

monolinguals, plus a control group of adults, with a forced-choice task in Italian. Children watched short video clips showing three characters in the foreground, and two in the background, either male or female. One of the characters would perform an action on other character, and a voice would ask what had happened (e.g., *Cosa ha fatto Minnie a Paperina? 'What did Minnie do to Daisy?'*). The background characters would give one answer each, and the children had to decide which character, in their opinion, spoke “better” Italian. Whereas examples 1-2 are both possible both in Spanish and Italian – despite cross-linguistic differences such as obligatory clitic doubling in Spanish for 1b –, English only allows SVO order (3):

1. a. *?pro* ha abbracciato lei (Italian)  
 b. *pro* la ha abrazado a ella (Spanish)  
 S V O  
 'she has hugged her'
2. a. *pro* l' ha abbracciata (Italian)  
 S O V  
 b. *pro* la ha abrazado (Spanish)  
 S O V  
 'she has hugger her'
3. She has hugged her  
 S V O

Whereas in Spanish and Italian, the choice of a correct answer, 2a, is dependent upon pragmatic information, namely that the question provides a non-contrastive context [-focus], in English, this type of pragmatic information is irrelevant. Their results showed a facilitative effect of typologically relatedness for Italian sentences of the type in (1-2), whereby Spanish-dominant children performed in a more native-like manner than the English. However, in contrastive [+focus] contexts, where the question was *Chi ha abbracciato Minnie? Ha abbracciato lei o lui? 'Who did Minnie hug? Did she hug him or her?'* and the required answer was 1a, no advantage for the typological similarity group was found. Thus, facilitative effects of typological similarity in the acquisition of grammatical properties exist but are often modulated by non-grammatical factors such as pragmatics and subtle crosslinguistic differences.

Paolieri *et al.* (2019) compared Italian speakers of Spanish to Russian speakers of Spanish on a translation task. Their prediction was that the Russian speakers of Spanish would translate words from L1 to L2 more slowly than the Italian-Spanish group owing to more similarity in the gender system between the latter two languages. More specifically, Spanish and Italian share number and type of gender values, namely masculine (MASC) and feminine (FEM), while Russian encodes 3 genders, MASC, FEM, and neuter. Their results confirmed a facilitative effect across the board in translation times except in cases where words were concrete rather than abstract in meaning. Moreover, gender-incongruency, namely that an L1 word mismatches its equivalent in L2 for gender (e.g., Italian *tigre*.FEM → Spanish *tigre*.MASC ‘tiger’; Russian *выход*. M → Spanish *salida*. FEM ‘departure’), also cancelled any facilitative effects of typological similarity. These results were interpreted to suggest that lexical gender features are simultaneously activated in both L1 and L2 regardless of proximity of the two gender systems.

In another study, Rodina *et al.* (2020), also found no facilitative effect of typological similarity when gender-incongruity was at stake. Heritage Russian children who were dominant in Latvian, Hebrew, Norwegian, German, and English were tested through an oral elicited imitation task for Russian words that were gender-incongruent to their semantic equivalents in the child's L1. Although German, like Russian, encodes a 3-way gender system, MASC, FEM, and neuter, the German-dominant group failed to show higher accuracy scores compared to the other groups whose dominant language either encoded two genders as in Latvian, Hebrew, and Norwegian, or none at all (i.e., English). This result is somewhat unexpected, as one would anticipate that a language with gender distinction – and particularly a three-gender system similar to the Russian paradigm – would facilitate transfer. However, because the target items were gender-incongruent with the child's L1, such similarity did not confer any advantage. On the basis of these results, it was concluded that the ambiguity and low frequency of gender cues in Russian play a greater role in accounting for the similarity of results across groups.

In a third study, Fuchs and Zeng (2024) compared German-dominant adult heritage speakers of Spanish to English-dominant heritage speakers of Spanish (reported in Fuchs, 2021) on the processing of gender using an eye-tracking Visual World Paradigm. In this experiment, participants listened to an aural prompt comprising a gender-marked article while looking at an image with a noun matching the determiner in gender. Furthermore, the noun's gender was either congruent or incongruent with an equivalent noun in the heritage speaker's dominant language if it encoded gender. Thus, while the condition was tested for the German-dominant group, gender congruency was irrelevant for design purposes in the English-Spanish group as English does not encode gender on nouns. Time of first fixation on the image after the onset of the article in the auditory prompt constituted the dependent variable of interest as it is assumed to represent a response time: faster response times reflect faster word recognition. Their results found no effect of gender incongruity across the two groups, consistent with the studies reviewed thus far that typological similarity does not play a facilitative effect in the presence of gender incongruity. Fuchs and Zeng (2024), moreover, confirm that the lack of facilitative effects for typological similarity when acquiring gender-incongruent nouns found in production (Paolieri *et al.*, 2019; Rodina *et al.*, 2020; Serratrice *et al.*, 2012) also holds for comprehension.

### 3. GENDER ASSIGNMENT IN SPANISH, ITALIAN, AND SWEDISH

In Italian, gender is binary, assigning either MASC or FEM values, and follows semantic and morphophonological rules (Chini, 1995). In terms of semantics, animate nouns mostly mark gender reflecting their biological sex (*cane*.MASC 'the he-dog' vs. *cagna*.FEM 'the she-dog') while inanimate nouns are assigned gender based on semantic criteria. Names of fruits, for instance, are intrinsically FEM, if they represent samples (*mela* {apple, FEM}) though MASC if denoting the tree to which they belong (*melo* {apple, MASC}) or if the fruit's lexeme is a loan word (*mango* {apple, MASC}). On the other hand, morphophonological rules determine a noun's gender based on word endings following the set of declension classes outlined in Table 1.

Table 1. *Gender declension classes in Italian*

Class	Final sound in SG	Final sound in PL	Gender	Example	Translation
I	-o	-i	M	libro/libri	book/books
II	-a	-e	F	carta/carte	paper/papers
III	-e	-i	M	cane/cani	dog/dogs
			F	ape/api	bee/bees
IV	[various]	[= SG]	M	re/re	king/kings
			F	città/città	city/cities
V	-a	-i	M	problema/problemi	problem/problems
VI	-o M	-i M/ -a F	M/F	uovo/uova	egg/eggs
VII	-o	-i	F	mano/mani	hand/hands

*Note.* From Chini (1995: 81).

Italian nouns ending in *-o* of class I are MASC (*libro* {book, MASC}) while those ending in *-a* of class II are FEM (*carta* {paper, FEM}). An exception to this rule consists of several words ending in *-o* denoting body parts which are MASC in singular form but FEM when plural. These form class VI in Table 1 and are exemplified by words such as *dito* {finger, SG, MASC} → *dita* {finger, PL, FEM}). In turn, several nouns which form class V ending in *-a* and of Greek origin are MASC (*problema* {problem, MASC}; *pianeta* {planet, MASC}). Lastly, nouns ending in *-e* of class III are the least predictable based on morphophonological rules. Because the last four classes mainly constitute exceptions, the present study will focus on the first three which are also the most morphologically productive. Gender assignment in Spanish is highly comparable to Italian (Table 2).

Table 2. *Gender declension classes in Spanish*

REGULAR				IRREGULAR
Inner core		Outer core		Residue
m	f	m	f	
<u>hijo</u> 'son'	<u>hija</u> 'daughter'	padre 'father'	mujer 'woman'	<u>problema</u> (m) 'problem'
<u>cedro</u> 'cedar'	<u>sidra</u> 'cider'	mar 'sea'	liebre 'hare'	<u>lejos</u> 'far'
				<u>tribu</u> (f) 'tribe'
				etc.

*Note.* From Harris (1991: 32).

The inner core of Harris (1991) is reminiscent of those nouns belonging to highly productive classes I and II of Italian in Figure 1 while the outer core resembles class III for nouns ending in *-e*. The residue category in Figure 2 encompasses the remaining classes IV, V, VI, and VII in Table 1.

In Swedish, assignment is less semantically and morpho-phonologically determined but occurs at the lexical level where either *uter* (U) or *neuter* (NU) values are assigned (see Table 3). Approximately 75% of all nouns in Swedish are *uter* as evidenced by both oral and written, formal and informal text forms (Nyqvist, Lahtinen, 2021). To a minor degree, semantic and morphophonological rules can determine a noun's gender value but the relationship between semantics and gender value is far less transparent in Swedish than Italian or Spanish. On the one hand, animate nouns tend to be U with NU *barn* 'child' constituting a notable exception. On the other, gender assignment for nouns can hardly ever be predicted based on the basis of inanimacy. Morphophonological rules such as word endings can be reliable cues, as in the case of the highly productive *-ing* which is assigned U, though form-to-gender mapping is generally considered unpredictable, requiring that gender be learned as rote forms (Nyqvist, Lahtinen, 2021). Similarly, gender-marking cannot be predicted based on shifting from a semantic class to another, *bund.U* (class II) → .FEM (class II). In Swedish, changes in the meaning of the same word, as in the case of homonymy or polysemy, do not always result in gender and thus a class change (e.g. *en plan* 'an open space' U → *ett plan* 'a floor' is NU). Table 3 depicts the 5 main declension classes of nouns in Swedish based on the morphophonological rules just described:

Table 3. *Gender declension classes in Swedish*

Class	Final sounds in pl.	Gender	Example SG/PL	Translation
I	-or	U	en <i>lampa</i> /flera <i>lampor</i>	A lamp/several lamps
II	-ar	U	en <i>säng</i> /flera <i>sängar</i>	A bed/several beds
III	-er	U	en <i>madrass</i> /flera <i>madrasser</i>	A mattress/several mattresses
		NU	ett <i>land</i> /flera <i>länder</i>	A country/several countries
IV	-In	NU	ett <i>täcke</i> /flera <i>täcken</i>	A duvet/ several duvets
V	bare	U	en <i>läkare</i> /flera <i>läkare</i>	A doctor/several doctors
		NU	ett <i>lakan</i> /flera <i>lakan</i>	A sheet/several sheets

*Note.* Adapted from Holmes, Hinchliffe (2013:16).

Unlike Italian and Spanish where a noun's declension class is largely predictable by its ending in the singular form, Swedish declension classes are mostly distinguishable by a noun's plural form. Moreover, a Swedish noun never changes in gender value from SG to PL form as in Italian declension class VI (e.g., *dito*.MASC → *dita*.FEM, *uovo*.MASC → *uova*.FEM.). However, Italian, Spanish, and Swedish are alike in that MASC/ FEM gender and U/NU genders appropriate their own classes, namely I and II in Figure 1, the inner core of Figure 2, and classes I and IV in Table 3 respectively. Moreover, all three languages have classes that allow both gender values: classes III and IV for Swedish, III and IV for Italian, and the outer core for Spanish words ending in *-e* in Figure 1 (*padre*.MASC and *libre*.FEM).

#### 4. STUDIES OF GENDER IN ADULT L2 AND HERITAGE LANGUAGE ACQUISITION

Studies of the acquisition of gender in heritage and L2 acquisition are far from uncommon. Narrowing in on the Swedish context specifically, Gudmundsson (2012) compiled a corpus of spoken interactions in teacher-L2 student dialogues to investigate

the acquisition of grammatical gender and number in Swedish learners of Italian. Her results show a gradual increase over time in accuracy of gender, consistent with the conclusions drawn from a study of the Pavia corpus mentioned earlier (Chini & Ferraris, 2006). However, L2Ss tended to misuse feminine gender in the plural and commit errors of gender marking more often with ambiguous noun endings, otherwise instances where one form has more than one function. Other results in the Swedish context come from the work of Bernardini (2009, among others).

Findings from Spanish, on the other hand, suggest that both heritage and L2Ss show protracted difficulties in both the comprehension and production of gender agreement and assignment. L2Ss of Spanish, for instance, are known to consistently diverge from native speakers of Spanish both in terms of production and comprehension (Franceschina, 2005; McCarthy, 2008; Montrul *et al.*, 2008, 2013; Grüter *et al.*, 2012; Faber, 2017 among others). In particular, in production, the masculine gender marking ending in *-o* tends to be overused in feminine contexts ending in *-a* rather than the opposite (Faber, 2017; McCarthy, 2008 among others). Likewise, in comprehension, feminine nouns are sometimes comprehended as masculine, particularly when the noun's gender class belongs to the outer core or residue in Figure 2. Moreover, the processing of lexical gender assignment has been shown to be characterised by high variability and instability (Hopp, 2013, 2016). In turn, HLSs have also been found to diverge from monolinguals, showing similar patterns to L2Ss for the overextension of masculine forms which act as a form of default in both production and comprehension (Montrul, Potowski, 2007; Alarcón, 2020; Montrul *et al.*, 2013; Cuza, Pérez-Tattam, 2016; Martínez-Nieto, Restrepo, 2021). The term default, here, is used to indicate the overuse or overextension of a form in interlanguage to contexts in which it does not apply, typically as a result of 'mapping problems' between surface forms and abstract features (Prévost, White, 2000). Following a Distributed Morphology approach (Halle, Marantz, 1993), when a word is inserted into the syntax (i.e., into a sentence being processed or produced), two types of features are relevant, the grammatical features of the lexical item itself and those of the syntactic node hosting it. A default form is assumed to be a lexical item whose grammatical feature specification either lacks a feature or is underspecified for its values (e.g., in the case of gender, a form can be [ $\pm$  MASC or  $\pm$  FEM]). The existence of default forms is, thus, explained as the result of a lexical item being inserted under the matching syntactic node with features failing to match exactly. In particular, when the features of the item and the node do not fully match, L2Ss resort to lexical items whose features can satisfy the node requirements of the syntactic node by means of, for instance, underspecification [ $\pm$  MASC]. In the case of gender defaults, therefore, forms underspecified as  $\pm$  MASC can occupy both nodes require + or -MASC features.

A second consistent finding in the literature is that HLSs do not perform better than L2Ss (Montrul, 2023, for a state-of-the-art). Crucially, such findings call into question the role of early exposure and argue against a critical period for the acquisition of an L2 or heritage language. Given that HLSs are first exposed to the target language at much earlier ages than L2Ss, one would expect them to perform in a more target-like manner, contrary to fact. In the present study, therefore, we take up this issue by comparing HLSs to L2Ss but we do so in Italian, an understudied language with a typologically similar gender system to Spanish.

## 5. THE CURRENT STUDY

In order to investigate typological similarity and the apparent lack of an advantage for earlier age of first exposure (AFE), the present study compares five groups on the oral

production and grammaticality judgments of gender in Italian: monolingual Italian controls, L2 and HLSs of Italian dominant in Swedish, and L2 and HLSs of Italian dominant in Spanish. In light of the similarity between the gender systems of Italian and Spanish, it can be predicted that typological similarity may allow L2Ss and HLSs of Spanish to converge with the monolingual Italian's performance more conspicuously than the Swedish counterparts. Furthermore, on the basis of the findings on AFE in the literature, we do not expect an advantage for HLSs over L2Ss due to earlier AFE as evidenced from previous research on heritage and L2 Spanish.

The present study aims to address the following research questions:

RQ1: Does typological similarity modulate the acquisition of gender in L2 and HLSs of Italian?

RQ2: What role does earlier AFE play in this context?

## 6. METHOD

### 6.1. Participants and background questionnaire

96 participants were recruited divided into heritage ( $n = 29$ ), L2 ( $n = 44$ ), and monolingual (L1) ( $n = 23$ ) Italian groups. The HL and L2 groups had Swedish or Spanish as their dominant (HLSs) or first language (L2Ss), depending on whether they were recruited in Sweden or Spain, and at intermediate to advanced level in Italian as measured by a cloze task described below. A background questionnaire adapted from Montrul *et al.*, (in progress; available upon request) was used to record key background information including but not limited to: origin and languages spoken by the participant and whether they perceived themselves as native; origin and languages spoken by the parents/caregivers and whether they were native; AFE to Italian, Swedish, Spanish, Catalan; estimated exposure to Italian, Swedish, Spanish, Catalan in years; education completed in Italian; self-assessed proficiency in productive and receptive skills in main languages spoken. 16 HLSs dominant in Swedish and 13 dominant in Spanish were recruited on the basis of the following shared characteristics: one or both native-speaking parents of first generation who were born and raised in the homeland; first exposed to Italian from birth (age 0) except for three participants whose age of onset was 1, 2 or 6.

From the HLSs group, all participants had knowledge of languages other than their respective L1 and Italian, mostly English, at varying proficiency levels. The Swedish HLSs estimated mean exposure to Italian through residence or periodic stays in Italy was 24 years ( $SD = 15.19$ ), and half had received formal instruction in Italian during childhood. The Spanish HLSs estimated mean exposure to Italian through residence or periodic stays in Italy was 24 years ( $SD = 13.18$ ), although they did not report receiving formal instruction in Italian during childhood.

In turn, the L2 group of which 14 were dominant in Swedish and 30 in Spanish were also born and raised in Sweden and Spain respectively. Some participants visited Italy regularly, while others did so only occasionally ( $M = 6.11$ ,  $SD = 6.57$ ). All L2Ss were first exposed to Italian after age 12 except 1 participant whose age of onset was 3 due to his/her Swedish-born parents moving to Italy for 6 months at that age. Four participants completed an undergraduate degree in Italy while half of the sample had knowledge of languages other than Swedish, Spanish, and Italian, mainly English. Finally, the L1 group members were born and raised in the Italian region of Veneto to control for any dialectal variations in responses, though not predicted to affect choice in terms of gender. They

were recruited from the University of Venice Ca' Foscari amongst 3<sup>rd</sup> and 4<sup>th</sup> year undergraduate students. Participant information is summarized in Table 4.

Table 4. *Basic Participant information*

		Age				Proficiency			AFE		
Groups	Country	N	M	SD	Range	M	SD	Range	M	SD	Range
HL	SW	16	30	11.42	16-52	74	12.59	55-91	.15	.38	0-1
	SP	13	31	9.34	16-58	70	12.13	57-89	.50	1.55	0-6
L2	SW	14	43	7.23	28-54	74	7.25	61-95	17.93	7.76	3-38
	SP	30	30	10.71	19-50	63	8.39	52-84	20.57	4.9	14-38
L1	IT	23	24	1.5	21-35	86	6	75-95	0	0	—

*Note.* HL = heritage language speaker group; L2 = second language speaker group; L1 = monolingual controls; SW = Sweden; SP = Spain; IT = Italy; M = mean score; SD = standard deviation; AFE = Age of first exposure to Italian.

Overall proficiency was determined via a cloze test created by Bianchi (2013) and Kupisch (2013), also implemented in Romano (2020, 2021) and Romano & Guijarro-Fuentes (2023), scored out of 44. The test is a rational-deletion cloze test (Carr, 2015) comprising a text (in Italian) with instructions, also in Italian, where pre-planned parts of speech were replaced by a gap for a total of 44 gaps. Each participant scored 1 point for a correct answer and 0 points for a missing or incorrect answer in each gap. The test is available here.

## 6.2. Target structures

Knowledge of gender was elicited via the oral production and grammaticality judgments of noun-accusative clitic agreement in structures referred to as clitic left dislocation (CLLD). An example is reported in (4) where the left-dislocated object N *I pesci* 'the fish' marked for MASC and PL is coreferential and must agree in gender and number with its anaphoric expression *li*.

(4) I pesci, Pietro li cucina all' aperto  
 the fish.OBJ Pietro.SUBJ them.cl cooks.V<sub>fin</sub> in-the-outdoors  
 "the fish, Pietro is cooking them outdoors"

In addition to items built on CLLD, filler items in the form of transitive and *si*-passive sentences were used to conceal the structure being tested from the participants. We explain how these were incorporated into the tests below.

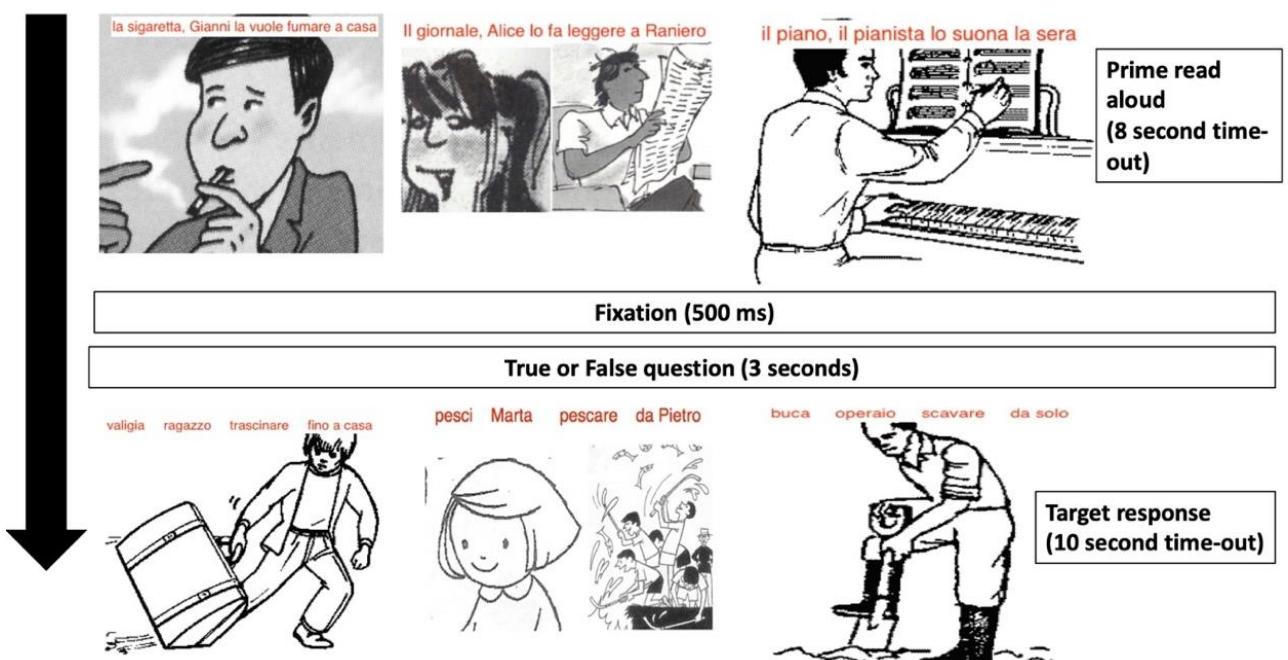
## 6.3. Materials

The oral production of gender was elicited via a variant of traditional structural priming. Structural priming as a paradigm is widely used to capture the strength of a syntactic representation in a speaker's grammar (Bernolet *et al.*, 2013; Jackson, Ruf, 2017; Mahowald, *et al.*, 2016 among others). It is also construed as a well-known tendency of

speakers to repeat and hearers to re-use a structure previously processed in the input for purposes of production or comprehension relative to one or more structures with the same meaning. To exemplify, upon hearing, reading, speaking, or writing an active sentence such as *the mechanic mended the car*, one is more likely to utter the active *the doctor cured the patient* rather than its equivalent passive form *passive the patient was cured by the doctor* or any other structure conveying the same meaning. Robust evidence of priming effects are attested for different constructions (Bock, 1986; Chang *et al.*, 2003; Ferreira, 2003; Scheepers, 2003, *inter alia*), L1s (Cai *et al.*, 2011; Hartsuiker, Kolk, 1998; Scheepers, 2003), L2s (Romano, 2016, 2018; Bernolet *et al.*, 2013; Mercan, Gürel, 2016), in language comprehension (Arai *et al.*, 2007; Traxler, 2008), in both spoken and written modalities (Bock, 1986; Pickering, Branigan, 1998), and between speaking and writing (Cleland, Pickering, 2006). As a paradigm, structural priming has been found to tap syntactic representations that are largely, though not entirely, independent of semantics and phonology (Branigan, Pickering, 2017, but see commentaries in the same special issue of *Behavioral and Brain Sciences* for objections). Although priming is especially indicated for studies of syntax, it can also be used as a means to elicit knowledge of morphological forms as in the present case. In fact, because structural priming tasks requires participants to focus on sentence structure, choice of a noun's form goes largely unnoticed during the exercise, thus better concealing the goal of eliciting knowledge of gender.

The task consisted of 6 practice trials followed by 24 critical items and 24 fillers for a total of 54 prime-target sentence pairs (i.e., trials). Participants first saw a picture containing a prime sentence that they were instructed to read out loud (8 sec time-out) (see Figure 1).

Figure 1. *Sample trial in the priming task. Photos are taken with permission from the International Picture Naming Project (Szekely *et al.*, 2004), Heaton (1966), and Van Patten, Lee, and Ballman (1992)*



In this way, each structure was primed both visually and aurally. A fixation point on the screen followed for 500 ms before a new blank screen containing a true or false comprehension question related to the picture appeared (3 sec time-out). The next slide showed a matching picture with four prompts above that needed to be used to produce the target sentence. At this point, participants produced speech as they were asked to use

the prompts to form a complete sentence describing the picture. There was a 10 secs trial time-out before the next trial began. Prime-target pairs always alternated with filler trials which were divided equally into transitives ( $k = 12$ ) (e.g., *il ragazzo apre la porta*) and *si*-passives ( $k = 12$ ) (e.g., *La mela si taglia col coltello*). The order of presentation of trials was automatically randomized for each participant.

A number of measures were taken in designing the items. For one, there was never a lexical overlap between the words in the prime and the prompts for the target sentence. Prompts were a bare noun object, a bare noun subject, a verb in the infinitive form, and a fully formed PP in that order. Prime and target verbs were always semantically unrelated as this overlap is known to promote a lexical boost in L2Ss (Bernolet *et al.*, 2013). Target objects were equally divided for MASC and FEM gender and contrasted with the objects in the prime by either gender or number (e.g., they differed only by MASC/FEM gender or SG/PL number). In this way, priming effects on retrieval of the referent's features were neutralised (i.e., there would be a higher chance of selecting MASC.SG for noun-clitic gender agreement in the target, if MASC.SG were primed in the reading/listening phase)

Judgment of gender was elicited via a speeded grammaticality judgment test (GJT). In particular, a participant's accuracy in judging a clitic's form in the case of CLLD structures, as well as their ability to detect an error in transitive and *si*-passive sentences was measured. The task presented participants with grammatical and ungrammatical versions of the CLLD, *si*-passive, and transitive structures. In the first case, ungrammatical sentences contained an error for gender agreement. Each sentence had to be processed by identifying the pronoun and its object referent, assigning the person, number, gender features to the left dislocated object, and checking if its features agreed with those encoded by the pronoun. Participants selected one of three answers on the keyboard, correct, incorrect, or not sure. A "not sure" answer was employed to minimise chance-guessing given a binary response would bring the guessing rate up to 50% in comparison to a ternary response system. A time-out limit of 5 seconds was set per item.

The items in the GJT were identical to the 48 critical and filler sentences of the priming task but in a grammatical and ungrammatical condition for a total of 96 items ( $48 \times 2$ ). Two parallel versions of the task were created so that no participant saw the same item in both grammatical and ungrammatical conditions in any one version. The order of presentation was automatically randomised at every iteration of the test though critical and filler items consistently alternated so that every critical item would be sandwiched between one sentence of each filler type (e.g., transitive, CLLD, *si*-passive, and so on). Sentences appeared all at once. After a response was recorded or a sentence timed-out, there followed a fixation point on the screen for 500 ms and a screen containing a new sentence appeared.

#### 6.4. Procedure

The background questionnaire and proficiency test were completed by the participant online at home. In Sweden and Italy, all participants completed the priming task and GJT in the presence of the researcher in a designated office space or lab, whereas in Spain, some participants completed the tasks in this manner ( $n = 21$ ), and the rest were tested online via Gorilla software ( $n = 23$ ). In all three countries, E-Prime experimental software 2.0 was used to run the priming task. Participants' oral responses were recorded via a laptops' in-built microphone and transcribed by the author, a native speaker of Italian, and the third author, an L2 speaker of Italian. Participants always completed the linguistic background questionnaire and proficiency test ahead of the priming task, which took 33 minutes and GJT, which took 8 minutes on average. At the end of the experiment,

participants were rewarded with a 10 € voucher for the university library's bookstore in Italy, a cinema ticket of comparable value in Sweden, and a taxable 10 € payment in Spain.

## 7. RESULTS

### 7.1. *Priming*

Responses were considered valid provided both an object NP and a clitic were present, regardless of the structure generated. In other words, for a response to be considered for accuracy, the structure produced needed not be CLLD. For example, if participants responded with a non-left dislocated version of (4) such as *Pietro, i pesci li cucina all'aperto* where the object *I pesci* is not left-dislocated but still produced an agreeing clitic *li*, the response would be retained for analysis. Next, all responses with incorrect co-referents – for instance, those in which the subject was substituted for the object or a word other than the ones present in the prompts – were excluded from analysis (e.g., *Pietro, i pesci lo cucinano all'aperto*). Likewise, responses where the clitic was omitted, incorrect case or other form was used were ignored. Accuracy in the production of gender marking was scored by summing the number of correctly versus incorrectly gender marked clitics. Table 5 reports the raw accuracy for all groups:

Table 5. *Raw scores for accuracy in the production of gender in the priming task*

Groups	Country	N	Correct		Incorrect		Total	
			Count	%	Count	%	Count	%
HL	SW	16	172	98	5	2	177	100
	SP	13	284	98	4	2	288	100
L2	SW	14	163	97	5	3	168	100
	SP	30	511	91	52	9	563	100
L1	IT	23	409	100	0	0	409	100

*Note.* HL = heritage language speaker group; L2 = second language speaker group; L1 = monolingual controls; SW = Sweden; SP = Spain; IT = Italy.

Results show high accuracy across the board, ranging from 91% accuracy in the L1 Spanish L2 Italian group to 100% accuracy in the monolingual group. Thus, we move to a more detailed analysis of the errors for which a descriptive overview is provided in Table 6.

Table 6. *Distribution of gender and number agreement errors in the priming task*

Groups	Country	N	Gender f-m	Gender m-f	Number sg-pl	Number pl-sg	Incongruity	Total
HL	SW	16	4	0	0	1	NA	5
	SP	13	1	0	0	0	3	4
L2	SW	14	1	3	0	1	NA	5
	SP	30	4	7	11	8	22	52
L1	IT	23	0	0	0	0	NA	0

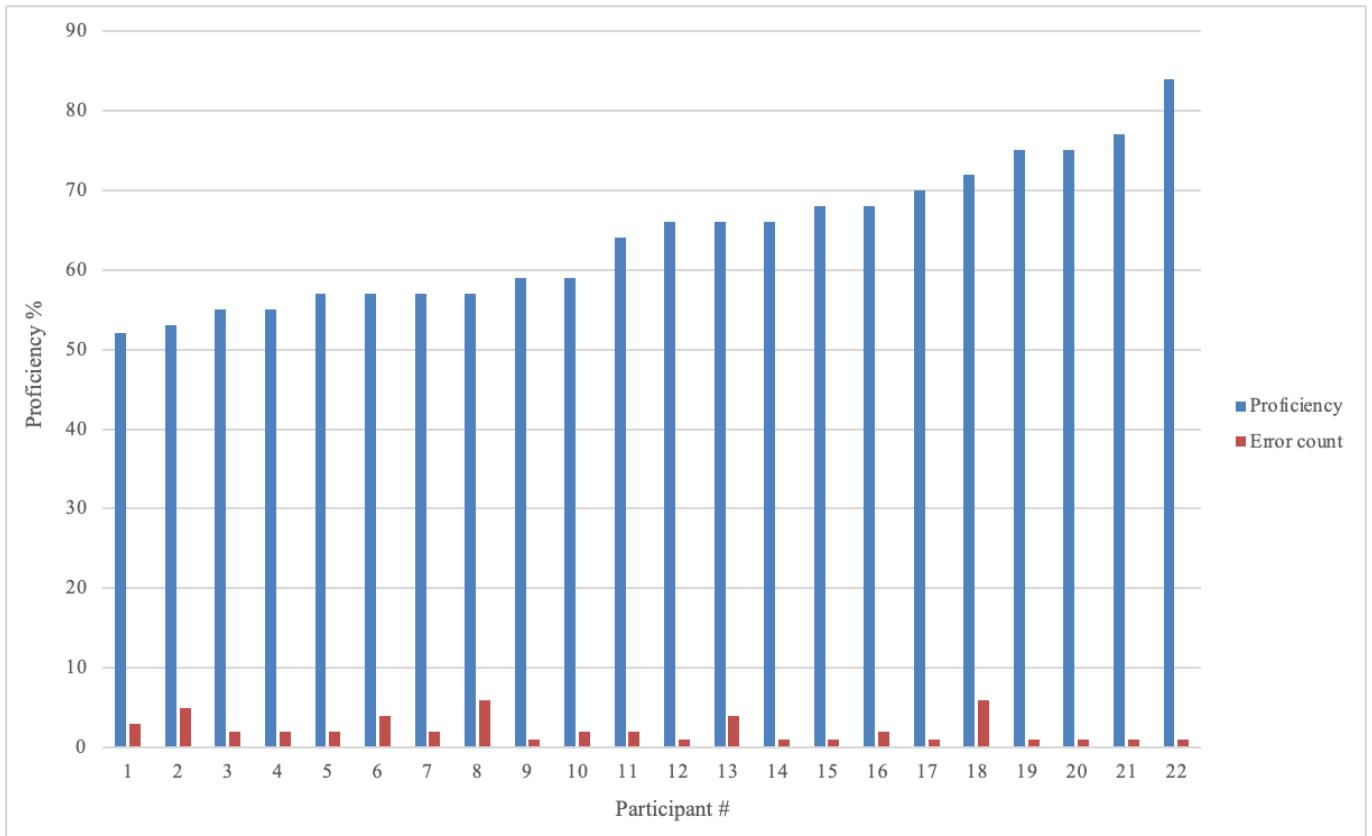
*Note.* Values in the table are counts. HL = heritage language speaker group; L2 = second language speaker group; L1 = monolingual controls; SW = Sweden; SP = Spain, IT = Italy; Gender f-m = female form overextended to male contexts; Gender m-f = male form overextended to female; Number sg-pl = singular number overextended to plural context; Number pl-sg = plural form overextended to singular context, incongruity = the target word's L1 cognate differs for gender marker; NA = not applicable.

Overall, all groups apart from the L1 Spanish L2 Italian group committed few errors. Based on the typological similarity of the gender systems, the Spanish groups were expected to have an advantage in the acquisition of gender, contrary to fact since the HLSs and L2Ss recruited in Sweden performed similarly to HLSs dominant in Spanish in number of errors. AFE, however, moderated the results to the extent that the HL group dominant in Spanish committed less errors (5) than the corresponding L2 group recruited in Spain (52), modulo that differences in terms of the quality and quantity of input received may also account for the finding. More specifically, the L2 group with L1 Spanish committed the highest number of gender agreement errors where gender incongruency figures with the highest rate (22 counts or 42% of the total 52 errors committed), followed by overextension of a singular for a plural form (11 instances, approximately 21% of the total number of errors). The errors for gender incongruency pertained three words, Italian <*la buca*.FEM> → Spanish <*el agujero*.MASC>, Italian <*la mappa*.FEM> → Spanish <*el mapa*>, and Italian <*il tavolo*.MASC> → Spanish <*la mesa*.FEM>. An example of each is reported in (5a-c).

In (5a), the speaker shows a congruency effect by incorrectly assigning MASC gender to *buca* as evidenced by the albeit correctly gender agreeing determiner *il* and clitic *lo*. Similarly, in (5b), the same speaker incorrectly assigns MASC to *mappa*. In both cases, the error is likely to be related to Spanish close cognates to *buca*, *agujero*, ‘the hole’, and *mappa*, *mapa*, ‘map’, bearing MASC rather than FEM gender. Finally, in (5c), the gender incongruity error is observed for the word <tavolo.MASC>, <mesa.FEM> in Spanish<sup>4</sup>. Overall, then, unlike previous studies of L2 and heritage Spanish, few overextensions of MASC to FEM contexts were observed. Instead, most gender-related errors were linked to congruency effects. As the proficiency level of participants in the L2 group may be implicated in the error rates, the distribution of errors by proficiency level is plotted in Figure 2.

<sup>4</sup> A reviewer notes that another possibility for the errors with *buca* and *tarola* are near-synonyms *buco*.MASC and *tarolo*.MASC respectively.

Figure 2. *Distribution of agreement errors in the priming task by proficiency in the L1 Spanish L2 Italian group*



Although counts remain low for any generalisations to be drawn, the data suggests no clear relationship between proficiency and error rate as higher error counts (taller red bars in Figure 2) do not correlate necessarily with higher proficiency (taller blue bars). We, thus, tentatively exclude an effect of proficiency and conclude that an effect of age of exposure only is relevant to explaining the gender congruency effect found in the use of clitics in the priming task.

## 7.2. Grammaticality judgment task

Accuracy rates in judgment of gender forms are shown in Table 7.

Table 7. *Raw scores for critical items in the grammaticality judgment test*

Groups	Country	N	Correct		Incorrect		Total	
			Count	%	Count	%	Count	%
HL	SW	12	403	81	92	19	495	100
	SP	13	541	87	73	13	614	100
L2	SW	12	346	82	73	18	419	100
	SP	30	1198	85	209	15	1407	100
L1	IT	27	1161	91	106	9	1267	100

*Note.* HL = heritage language speaker group; L2 = second language speaker group; L1 = monolingual controls; SW = Sweden; SP = Spain, IT = Italy. Responses missing from the table included those faster than 1sec, timed-out, and results from participants whose scores were at perfect ceiling (i.e., 100% accurate). Missing responses: HL SW = 17% of data; HL SP = 2%, L2 SW = 25%; L2 SP = 3%; L1 IT = 2%.

All groups score highly regardless of typological similarity or age of first exposure factors with accuracy ranging between 81-87% in the HL groups and 83-85% in the L2 groups. More of interest are the incorrect responses as they may coincide with the items for which gender-marking errors were more frequent in the production task. A closer look at the incorrect answers reveals the items that participants most often misjudged were not those presenting gender incongruity, but ungrammaticality as in the ungrammatical versions of items 1, 9, and 21:

Item 1: \*Le bollette, Alice li paga ogni mese  
the bills.OBJ.FEM.PL Alice them.cl.OBJ.MASC.PL pays every month  
Target: Le bollette, Alice le paga ogni mese

Item 9: \*I vestiti, Alice le compra a saldi  
the clothes.OBJ.MASC.PL Alice them.cl.OBJ.FEM.PL buys on sale  
Target: I vestiti, Alice li compra a saldi

Item 21: \*Pietro, il marinaio la salva dalle onde  
Pietro.OBJ.MASC.SG the sailor him.cl.FEM.SG saves from-the waves  
Target: Pietro, il marinaio lo salva dalle onde

Moreover, the errors above were committed by participants across all groups and not only the L1 Spanish L2 Italian group who committed high numbers of errors in the production task.

In conclusion, all groups were accurate in the production of gender with rates above 91%. A more detailed analysis revealed the highest number of errors was committed by the L1 Spanish L2 Italian group, suggesting an AFE effect in interaction with typological similarity. In other words, the data showed that speakers of Italian exposed to it after the age of 13 (i.e., L2Ss) acquire gender to a worse degree than early learners (i.e., HLSs) when the L1, in this case Spanish, is typologically similar, given the L2 and HLSs who were native in Swedish did not produce a comparable number of errors (i.e., typological similarity resulted in a negative effect). By contrast, in the GJT, all groups were similarly accurate in judging gender agreement with rates ranging between 81 and 87%. A detailed analysis revealed, unlike the production task, that errors were more likely due to judging some ungrammatical items, and thus judging of ungrammaticality, rather than lexical issues such as gender incongruity, suggesting neither an effect of AFE or typological similarity.

## 8. DISCUSSION

The purpose of this study was two-fold. On the one hand, it set out to examine whether the acquisition of gender in Italian is affected by typological similarity between the two languages known by the bilingual. This was achieved by design via a comparison of groups whose dominant/L1 gender system was either different (Swedish) or highly similar (Spanish) to Italian. In turn, the controversial role of AFE was also investigated

by further subdividing the two groups during recruitment into speakers with either AFE 0 (i.e., HLSs) or AFE starting at age 13 (i.e., L2Ss).

In terms of typological similarity, no advantage was found for speakers of two highly similar gender systems. In both production and judgment, all groups displayed high levels of accuracy in their knowledge of gender marking on the object clitics. However, in the production task, it was found that typological similarity between the lexicon and morphology of Spanish and Italian had negative transfer effects, leading to lower accuracy in the L1 Spanish L2 Italian group. In particular, it was observed that Italian *<la buca.FEM>* → Spanish *<el agujero.MASC>*, Italian *<la mappa.FEM>* → Spanish *<el mapa>*, and Italian *<il tavolo.MASC>* → Spanish *<la mesa.FEM>* resulted in a large number of errors but only in the L1 Spanish L2 Italian group. Such an outcome indicates an interaction between AFE and typological similarity, corroborated also by the more general finding that L1 Spanish L2 Italian group committed the highest number of gender and number assignment errors. number of gender incongruity errors observed for *mappa*, *tavolo*, and *buca*, it would appear that speakers of a typologically similar language who begin acquiring the target language later in life have difficulty reassembling semantic features in the lexicon when the semantically equivalent word in the dominant language is specified for the other gender value. Given the high number of gender incongruity errors observed for *mappa*, *tavolo*, and *buca*, it would appear that speakers of a typologically similar language who begin acquiring the target language later in life have difficulty reassembling semantic features in the lexicon when the semantically equivalent word in the dominant language is specified for the other gender value: Italian *la mappa* {map, SG, FEM} → Spanish *el mapa* {map, SG, MASC}; Italian *il tavolo* {table, SG, MASC} → Spanish *la mesa* {table, SG, FEM}, Italian *la buca* {hole, SG, FEM} → Spanish *el agujero* {hole, SG, MASC}. We interpret this result to indicate that later AFE interacts with typological similarity leading to a negative effect. It was further ascertained that there was no direct correlation between proficiency level and error rate, thus excluding that gender errors were related to lower proficiency levels (Figure 2). All in all, pedagogically-speaking, this finding recommends acquiring Italian at an earlier age when the other language spoken by the bilingual is typologically similar for a given grammatical property. Such a conclusion is, nevertheless, moderated by the fact the study was not originally meant to test gender congruency and should, thus, be followed with caution given the limited number of items included to test the effect. Future studies examining typological similarity effects need to be implemented with tasks that include a balance of gender congruent and gender incongruent words in the vein of Fuchs and Zeng (2024), Paolieri *et al.* (2019), and Rodina *et al.* (2020). As the congruency effect is manifest in both directions, from MASC to FEM and vice versa, no gender value is affected more than the other.

Another meaningful finding is the lack of evidence for masculine forms acting as default forms in both production and comprehension, a pattern largely attested for Spanish (Montrul, Potowski, 2007; Alarcón, 2020; Montrul *et al.*, 2013; Cuza, Pérez-Tattam, 2016; Martínez-Nieto, Restrepo, 2021). Recall from Table 6 that gender agreement errors in production were equally distributed between MASC → FEM and FEM → MASC overextensions with counts of 10 in both cases, while in judgment, errors resulted mostly from processing ungrammatical sentences rather than from difficulties with gender features. Therefore, the relative success in acquiring Italian gender found in the present study contrasts with the persistent difficulty shown for the acquisition of gender in L2 and heritage Spanish (McCarthy, 2008; Montrul *et al.*, 2008, 2013; Grüter *et al.*, 2012; Franceschina, 2005; Faber, 2017 among others) and reiterates findings elsewhere (Romano, 2023). Future studies factoring in proficiency by examining production and comprehension of gender by including lower proficiency levels are needed to conclude

that Italian sets itself apart from Spanish in this respect, as our results are limited to intermediate-advanced learners.

One final aspect of the data meriting discussion is the asymmetry in errors across task types. In particular, while the production task elicited a high number of errors in the L2 group dominant in Spanish, the same did not obtain in the GJT where all groups performed at similar accuracy levels (81-87%) and tended to commit more errors when the items involved ungrammaticality.

The same asymmetry between task types holds for the gender incongruity effect found in production which accounted for more than any other errors in the L1 Spanish L2 Italian group. In the GJT, neither the L1 Spanish L2 Italian nor HLSs dominant in Spanish showed any particular difficulty with gender incongruent words, *buca*, *tavolo*, and *mappa*. In consequence, it is possible that being dominant in a non-typologically similar language, Swedish in the case at hand, can lead to advantages in the production of gender, higher ultimate attainment of gender assignment and unhindered (re)assembling of features in the lexicon. Yet another possibility is that the asymmetry could be accounted for along the lines of processing limitations (Trenkic, 2007 among others).

## 9. CONCLUSION

The acquisition of gender poses less difficulty in Italian than Spanish as a target language. In contrast to previous studies on the acquisition of Spanish gender by heritage and L2Ss which have shown consistent divergence in comprehension and production between these groups and monolingual speakers in the mainland, the acquisition of a highly similar gender system such as that of Italian is relatively straightforward. In this context, findings from Italian also set themselves apart in terms of a default gender form insofar as the masculine form attested as a default for Spanish does not serve the same function in Italian. Moreover, the relative success in ultimate attainment of Italian gender is largely invulnerable to AFE or typological similarity effects. Speakers dominant in a typological similar language do not present any intrinsic advantages over speakers of less similar languages to Italian, rather they may be hindered by considerable L1-L2 overlap when the L2 noun is incongruent in gender value to its L1 equivalent. In this context, L2Ss of typologically similar languages have difficulty assigning gender, albeit only in production, putatively due to missed reassembly of gender features in the lexicon. This effect is, nevertheless, may be moderated by AFE, whereby only L2Ss who begin acquiring the L2 at or after the age of 13 are affected by L1-L2 gender incongruity. Future studies designed from the outset to test gender congruency effects are needed, however, as the data shown indicating difficulty in reassembling gender features in the presence of AFE and two typologically similar languages was limited.

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## REFERENCES

Arai M., Van Gompel R. P. G., Scheepers C. (2007), “Priming ditransitive structures in comprehension”, in *Cognitive Psychology*, 54, 3, pp. 218-250: <https://doi.org/10.1016/j.cogpsych.2006.07.001>.

Alarcón I. (2020), “Early and late bilingual processing of Spanish gender, morphology, and gender congruency”, in *Borealis: An International Journal of Hispanic Linguistics*, 9, 1, pp. 175-208: <https://doi.org/10.7557/1.9.2.5523>.

Bernardini P. (2009), *Cross-linguistic influence does not occur in all grammatical domains: evidence from grammatical gender in code-mixed DPs*. Unpublished doctoral dissertation, University of Lund.

Bernolet S., Hartsuiker R. J., Pickering M. J. (2013), “From language-specific to shared syntactic representations: The influence of second-language proficiency on syntactic sharing in bilinguals”, in *Cognition*, 127, 3, pp. 287-306: <https://doi.org/10.1016/j.cognition.2013.02.005>.

Bianchi G. (2013), “Gender in Italian-German bilinguals: a comparison with German L2 learners of Italian”, in *Bilingualism: Language and Cognition*, 16, 3, pp. 538-557: <https://doi.org/10.1017/S1366728911000745>.

Bock K. (1986), “Syntactic persistence in language production”, in *Cognitive Psychology*, 18, 3, pp. 355-387.

Branigan H. P., Pickering M. J. (2017), “An experimental approach to linguistic representation”, in *Behavioral and Brain Sciences*, 40, e282: <https://doi.org/10.1017/S0140525X16002028>.

Cai Z. G., Pickering M. J., Branigan H. P. (2011), “Mapping concepts to syntax: Evidence from structural priming in Mandarin Chinese”, in *Journal of Memory and Language*, 64, 3, pp. 265-279.

Chang F., Bock K., Goldberg A. E. (2003), “Can thematic roles leave traces of their places?”, in *Cognition*, 90, 1, pp. 29-49: [https://psycnet.apa.org/doi/10.1016/S0010-0277\(03\)00123-9](https://psycnet.apa.org/doi/10.1016/S0010-0277(03)00123-9).

Chini M. (1995), *Genere grammaticale e acquisizione. Aspetti della morfologia nominale dell’italiano L2*, FrancoAngeli, Milano.

Chini, M. & Ferraris, S. (2006). ”Morfologia del nome”, in Giacalone-Ramat A. (ed.), *Verso L’Italiano*, Carocci, Roma.

Cleland A. A., Pickering M. J. (2006), “Do writing and speaking employ the same syntactic representations?”, in *Journal of Memory and Language*, 54, 2, pp. 185-198: <https://doi.org/10.1016/j.jml.2005.10.003>.

Collier V. P., Thomas W. P. (2017), “Validating the power of bilingual schooling: Thirty-two years of large-scale, longitudinal research”, in *Annual Review of Applied Linguistics*, 37, pp. 203-217: <https://doi.org/10.1017/S0267190517000034>.

Cuza A., Pérez-Tattam R. (2016), “Grammatical gender selection and phrasal word order in child heritage Spanish”, in *Bilingualism: Language and Cognition*, 19, 2, pp. 332-350: <https://doi.org/10.1017/S1366728914000893>.

Faber A. (2017), “Assigning grammatical gender to novel nouns in L1 and L2 Spanish” [Unpublished doctoral dissertation], University of Massachusetts Amherst.

Ferreira F. (2003), “The misinterpretation of noncanonical sentences”, in *Cognitive Psychology*, 47, 2, pp. 164-203: [https://doi.org/10.1016/S0010-0285\(03\)00005-7](https://doi.org/10.1016/S0010-0285(03)00005-7).

Foote R. (2009), “Transfer in L3 acquisition: The role of typology”, in Leung Y.-K. I. (ed.), *Third language acquisition and universal grammar*, Multilingual Matters, Bristol, pp. 89-114: <https://doi.org/10.21832/9781847691323-008>.

Franceschina F. (2005), *Fossilized second language grammars: The acquisition of grammatical gender*, John Benjamins, Amsterdam.

Fuchs Z. (2021), “Facilitative use of grammatical gender in heritage Spanish”, in *Linguistic Approaches to Bilingualism*, 12, 6, pp. 845-871:  
<https://doi.org/10.1075/lab.20024.fuc>.

Fuchs Z., Zeng W. (2024), “Facilitative processing of grammatical gender in heritage speakers with two gender systems”, in *Heritage Language Journal*, 21, 1, pp. 1-33:  
<https://doi.org/10.1163/15507076-bja10028>.

Giacalone Ramat A. (2012), “Typology and second language acquisition”, in Chapelle C. A. (ed.), *The encyclopedia of applied linguistics*, Wiley-Blackwell, Oxford:  
<https://doi.org/10.1002/9781405198431.wbeal1233>.

Grüter T., Lew-Williams C., Fernald A. (2012), “Grammatical gender in L2: A production or a real-time processing problem?”, in *Second Language Research*, 28, 2, pp. 191-215:  
<https://doi.org/10.1177/0267658312437990>.

Gudmundson A. (2012), *L'accordo nell'italiano parlato da apprendenti universitari svedesi: uno studio sull'acquisizione del numero e del genere in una prospettiva funzionalista* [Doctoral dissertation, Stockholm University]. Retrieved from:  
<https://urn.kb.se/resolve?urn=urn:nbn:se:su:diva-78854>.

Halle M., Marantz A. (1993), “Distributed Morphology and the pieces of inflection”, in Hale K., Keyser S. J. (eds.), *The view from building 20: essays in linguistics in honor of Sylvain Bromberger*, MIT Press, Cambridge (MA), pp. 111-176.

Harris J. W. (1991), “The exponence of gender in Spanish”, in *Linguistic Inquiry*, 22, 1, pp. 27-62.

Hartsuiker R. J., Kolk H. H. (1998), “Syntactic persistence in Dutch”, in *Language and Speech*, 41, 2, pp. 143-184: <https://doi.org/10.1111/j.0956-7976.2004.00693.x>.

Heaton J. B. (1966), *Composition through pictures*, Longman, London.

Holmes P., Hinchliffe Ian. (2013<sup>3</sup>), *Swedish. A Comprehensive Grammar*, Routledge, New York-London.

Hopp H. (2013), “Grammatical gender in adult L2 acquisition: Relations between lexical and syntactic variability”, in *Second Language Research*, 29, 1, pp. 33-56:  
<https://doi.org/10.1177/0267658312461803>.

Hopp H. (2016), “Learning (not) to predict: Grammatical gender agreement in non-native processing”, in *Second Language Research*, 32, 2, pp. 277-307:  
<https://doi.org/10.1177/0267658315624960>.

Jackson C. N., Ruf H. T. (2017), “The priming of word order in second language German”, in *Applied Psycholinguistics*, 38, 2, pp. 315-345:  
<https://doi.org/10.1017/S0142716416000205>.

Johannessen J. B., Lundquist B., Rodina Y., Tengesdal E., Kaldhol N. H., Türker E., Fyndanis V. (2024), “Cross-linguistic effects in grammatical gender assignment and predictive processing in L1 Greek, L1 Russian, and L1 Turkish speakers of Norwegian as a second language”, in *Second Language Research*:  
<https://doi.org/10.1177/02676583241227709>.

Kupisch T. (2013), “Adjective placement in simultaneous bilinguals (German-Italian) and the concept of cross-linguistic overcorrection”, in *Bilingualism: Language and Cognition*, 17, 1, pp. 222-233: <https://doi.org/10.1017/S1366728913000382>.

Lee Y. Y. A. (2022), “A conceptual analysis of typological distance and its potential consequences on the bilingual brain”, in *International Journal of Bilingual Education and Bilingualism*, 9, pp. 3333-3346:  
[https://www.researchgate.net/publication/359428332\\_A\\_conceptual\\_analysis\\_of\\_typological\\_distance\\_and\\_its\\_potential\\_consequences\\_on\\_the\\_bilingual\\_brain#:~:text=https%3A//doi.org/10.1080/13670050.2022.2052790](https://www.researchgate.net/publication/359428332_A_conceptual_analysis_of_typological_distance_and_its_potential_consequences_on_the_bilingual_brain#:~:text=https%3A//doi.org/10.1080/13670050.2022.2052790).

Leivada E., Guenther F., Masullo C., Duñabeitia J., Westergaard M., Rothman J. (2025), “A multi-metric analysis of 50,000 linguistic profiles provides sparse evidence that language distance modulates bilingual cognition”, *PsyArXiv Preprints*: [https://doi.org/10.31234/osf.io/9uqbm\\_v2](https://doi.org/10.31234/osf.io/9uqbm_v2).

Levy-Scherrer L. P., Lindemalm K. (2014), *Rivstart A1 + A2 Textbok*, Natur och Kultur, Stockholm.

Mahowald K., James A., Futrell R., Gibson E. (2016), “A meta-analysis of syntactic priming in language production”, in *Journal of Memory and Language*, 91, pp. 5-27: <https://doi.org/10.1016/j.jml.2016.03.009>.

Martínez-Nieto L., Restrepo M. A. (2021), “Grammatical gender in Spanish child heritage speakers”, in *Linguistic Approaches to Bilingualism*, 11, 4, pp. 563-589: <https://doi.org/10.1075/lab.20042.mar>.

McCarthy C. (2008), “Morphological variability in the comprehension of agreement: An argument for representation over computation”, in *Second Language Research*, 24, 4, pp. 459-486: <https://doi.org/10.1177/0267658308095739>.

Mercan G., Gürel A. (2016), “Structural priming in L2 Turkish”, in *Second language acquisition of Turkish*, pp. 313-332: <https://doi.org/10.1075/lald.59.12mer>.

Montrul S. (2004), *The acquisition of Spanish: Morphosyntactic development in monolingual and bilingual L1 acquisition and adult L2 acquisition*, John Benjamins, Amsterdam.

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”, in *Language Learning*, 58, 3, pp. 503-553: <https://doi.org/10.1111/j.1467-9922.2008.00449.x>.

Montrul S. (2010), “How similar are L2 learners and heritage speakers? Spanish clitics and word order”, in *Applied Psycholinguistics*, 31, 1, pp. 167-207: <https://doi.org/10.1017/S014271640999021X>.

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

Montrul S. (2018), “Heritage language development: Connecting the dots”, in *International Journal of Bilingualism*, 22, 5, pp. 530-546: <https://doi.org/10.1177/1367006916654368>.

Montrul S. (2023), *Native speakers, interrupted: Differential object marking and language change in heritage languages*, Cambridge University Press, Cambridge.

Montrul S., de la Fuente I., Davidson J., Foote R. (2013), “The role of experience in the acquisition and production of diminutives and gender in Spanish”, in *Second Language Research*, 29, pp. 87-118: <https://doi.org/10.1177/0267658312458268>.

Montrul S., Potowski P. (2007), “Command of gender agreement in school-age Spanish bilingual children”, in *International Journal of Bilingualism*, 11, pp. 301-328: <https://doi.org/10.1177/13670069070110030301>.

Nyqvist E., Lahtinen L. (2021), “Grammatical gender in L2 Swedish in Finnish-speaking immersion students: a comparison with non-immersion students”, in *Nordic Journal of Linguistics*, 44, 3, pp. 281-303: <https://doi.org/10.1017/S0332586520000256>.

Paolieri D., Padilla F., Koreneva O., Morales L., Macizo P. (2019), “Gender congruency effects in Russian-Spanish and Italian-Spanish bilinguals: The role of language proximity and concreteness of words”, in *Bilingualism: Language and Cognition*, 22, pp. 112-129: <https://psycnet.apa.org/doi/10.1017/S1366728917000591>.

Pickering M. J., Branigan H. P. (1998), “The representation of verbs: Evidence from syntactic priming in language production”, in *Journal of Memory and Language*, 39, 4, pp. 633-651: <https://doi.org/10.1006/jmla.1998.2592>.

Prévost P., White L. (2000), “Missing Surface Inflection or Impairment in second language acquisition? Evidence from tense and agreement”, in *Second Language*

Research, 16, 2, pp. 103-133: <https://doi.org/10.1191/026765800677556046>.

Putnam M. T., Carlson M., Reitter D. (2018), “Integrated, not isolated: Defining typological proximity in an integrated multilingual architecture”, in *Frontiers in Psychology*, 8, pp. 1-16: <https://doi.org/10.3389/fpsyg.2017.02212>.

Rodina Y., Westergaard M. (2017), “Grammatical gender in bilingual Norwegian–Russian acquisition: The role of input and transparency”, in *Bilingualism: Language and Cognition*, 20, 1, pp. 197-214: <https://doi.org/10.1017/S1366728915000668>.

Rodina Y., Kupisch T., Meir N., Mitrofanova N., Urek O., Westergaard M. (2020), “Internal and external factors in heritage language acquisition: Evidence from heritage Russian in Israel, Germany, Norway, Latvia, and the United Kingdom”, in *Frontiers in Education*: <https://doi.org/10.3389/feduc.2020.00020>.

Romano F. (2016), “Syntactic planning of English genitives in L1 and L2 production: The animacy rule model”, in *Lingua*, 184, pp. 104-121: <https://doi.org/10.1016/j.lingua.2016.06.004>.

Romano F. (2018), “The basis continuity hypothesis of L1 to L2 production”, in *Second Language Research*, 34, 3, pp. 275-308: <https://doi.org/10.1177/0267658317729423>.

Romano F. (2020), “Ultimate attainment in heritage language speakers: Syntactic and morphological knowledge of Italian accusative clitics”, in *Applied Psycholinguistics*, 41, 2, pp. 347-380: <https://doi.org/10.1017/S0142716419000559>.

Romano F. (2021), “L1 versus dominant language transfer effects in L2 and heritage speakers of Italian: A structural priming study”, in *Applied Linguistics*, 42, 5, pp. 945-969: <https://doi.org/10.1093/applin/amaa056>.

Romano F. (2023), “Ultimate attainment of gender in heritage and L2 Italian”, in Romano F. (ed.), *Studies in Italian as a Heritage Language*, De Gruyter Mouton, pp. 95-126: <https://doi.org/10.1515/9783110759587-005>.

Romano F., Guijarro-Fuentes P. (2023), “Task effects and the yes-bias in heritage language bilingualism”, in *International Journal of Bilingual Education and Bilingualism*, 27, 3, pp. 389-409: <https://doi.org/10.1080/13670050.2023.2206949>.

Scheepers C. (2003), “Syntactic priming of relative clause attachments: Persistence of structural configuration in sentence production”, in *Cognition*, 89, 3, pp. 179-205: [https://doi.org/10.1016/S0010-0277\(03\)00119-7](https://doi.org/10.1016/S0010-0277(03)00119-7).

Serratrice L., Sorace A., Filiaci F., Baldo M. (2012), “Pronominal objects in English-Italian and Spanish-Italian bilingual children”, in *Applied Psycholinguistics*, 33, pp. 725-751: <https://doi.org/10.1017/S0142716411000543>.

Stensson L. (2013), *A grammar of Swedish: The Runeberg Project*, Linköping University: <https://www.lysator.liu.se/language/Languages/Swedish/Grammar.html#nouns>.

Szekely A., Jacobsen T., D’Amico S., Devescovi A., Andonova E., Herron D., Bates E. (2004), “A new on-line resource for psycholinguistic studies”, in *Journal of Memory and Language*, 51, 2, pp. 247-250: <https://doi.org/10.1016/j.jml.2004.03.002>.

Traxler M. J. (2008), “Structural priming among prepositional phrases: Evidence from eye movements”, in *Memory & Cognition*, 36, 2, pp. 269-280: <https://doi.org/10.3758/MC.36.3.659>.

Trenkic D. (2007), “Variability in second language article production: Beyond the representational deficit vs. processing constraints debate”, in *Second Language Research*, 23, 3, pp. 289-327: <https://doi.org/10.1177/0267658307077643>.

VanPatten B., Lee J. F., Ballman T. L., Dvorak T. (1992), *¿Sabías que...?*, McGraw-Hill, New York.

Von Grebmer Zu Wolfsturn S., Gupta A., Pablos L., Schiller N. O. (2023), “When left is right: The role of typological similarity in multilinguals’ inhibitory control performance”, in *Bilingualism: Language and Cognition*, 26, 1, pp. 165-178: <https://doi.org/10.1017/S1366728922000426>.

Westergaard M., Mitrofanova N., Mykhaylyk R., Rodina Y. (2017), “Crosslinguistic influence in the acquisition of a third language: The linguistic proximity model”, in *International Journal of Bilingualism*, 21, pp. 666-682:  
<https://doi.org/10.1177/1367006916648859>.

