

Article

# His or Her? Errors in Possessive Determiners Made by L2-English Native Spanish Speakers

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**Abstract:** Native Spanish speakers commonly confuse third person singular possessive determiners when making gender agreements, which is considered an error-prone grammatical feature because there are syntactic differences in their use between English and Spanish. This study conducted an elicited production task to explore whether proficiency in English affects the correct use of his/her by Spanish speakers in speech production, whether participants make more errors depending on the gender match or mismatch between the possessor and the possessum in the noun phrase, and whether there are differences in the number of errors made due to the gender of the possessor. The results showed that sentences with a gender mismatch condition had higher error rates and that advanced L2 speakers made fewer mistakes than less proficient ones. However, proficiency did not mitigate the number of errors in sentences which required the use of the feminine possessive determiner, which is in line with the theory of the default masculine gender in Spanish. The study provides valuable insights into the challenges faced by native Spanish speakers when producing possessive gender agreements in English and highlights the need for more targeted instruction to address these issues in the teaching of English as a foreign language.

**Keywords:** possessive determiners; EFL; Spanish-native speakers; transfer; elicited production task



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## 1. Introduction

Numerous researchers have endeavoured to explain why second language (L2) speakers make errors when speaking in their non-native language (Montrul 2011; Hopp 2013). Factors such as age of acquisition, learning environment, quality and quantity of input for both languages, and language similarity have been identified as key determinants of L2 errors (Hartsuiker et al. 2004; Marchman et al. 2010). Although various approaches have been proposed to account for L2 processing errors, it is generally agreed that these arise from how L2 learners execute linguistic procedures. Errors can be persistent or temporary (Sabourin and Stowe 2008), and persistent errors may be caused by deficient or abundant automatization, which refers to the automatic application of a specific morphological or syntactic procedure. When automatization is deficient, such as when the L2 requires a specific morphological or syntactic procedure that is not required in the L1 and the L2 speaker fails to implement it, persistent errors occur. Achieving automatization in the L2, even when the grammar rule is easy to learn, can be quite challenging. For example, gender agreement errors are commonly observed in L2 learners when the gender agreement system in the L1 differs from that in the L2, which may be due to morphological structures such as possessives, adjectives, or determiners (as in Spanish) that require gender agreement but are absent in the L2 (as in English). On the other hand, abundant automatization, also known as L1 transfer, occurs when L2 learners assign the same lexical and grammatical rules to the L2 that they use in their L1 (Antón-Méndez 2011; Kroll et al. 2008). This phenomenon may lead to grammatical errors, such as the incorrect placement of adjectives in English, where they precede the noun, unlike in Spanish where they follow it. Gender

agreement errors are a frequent type of L2 error made with possessives between English and Spanish. Research has explained this by attributing the problem to the pressure during production of morphological accuracy, which differs from comprehension in that the former involves actual action on the part of the speaker while the latter is a form of perception (Hopp 2013; Truscott and Smith 2004). The use of possessives requires both syntactic and lexical knowledge (Antón-Méndez et al. 2002) and involves gender agreement and gender assignment. Given the syntactic differences in their use between English and Spanish, possessives are a particularly error-prone grammatical feature.

### 1.1. Transfer and Errors in L2

L2 errors are often attributed to transfer, which occurs when lexical, phonological, or syntactic rules from one language are automatically assigned to another language. This can lead to grammatical, phonological, and lexical errors due to abundant automatization. According to Poulisse (1999), both L1 and L2 are activated during the production of one language, which increases the likelihood of transfer from L1 to L2 or vice versa (Antón-Méndez 2011; Kroll et al. 2008; Balabakgil et al. 2015). However, other studies suggest that transfer only occurs when dissimilar constructions are present in L1 and L2 (Marchman et al. 2010; Tokowicz and MacWhinney 2005).

Transfer, which occurs when both the L1 and L2 are activated simultaneously, has been considered a significant cause of L2 errors (Poulisse 1999). However, research has shown that not all L2 speakers make mistakes due to transfer, as some are able to inhibit one language to avoid cross-linguistic influence and use the appropriate lexicon in their L2 (Kovac 2011). This inhibitory effect is directly related to abundant automatization and can explain why some L2 speakers are able to avoid transfer errors (Antón-Méndez 2011). Kroll et al. (2008) also found that participants living in an L2 environment were able to inhibit their L1 to avoid making errors in their L2, suggesting that L1 inhibition depends on the L2 speaker's proficiency level (Green 1986). The present study recruited intermediate and advanced L2 English speakers to investigate the role of proficiency level in transfer.

According to theories on language production and transfer, the maturational state hypothesis (Johnson and Newport 1989) suggests that the acquisition of any language should occur early in childhood in order to fully develop all language levels (such as phonology and grammar). This can minimize negative transfer effects (errors) regardless of the number of languages acquired (Johnson and Newport 1989; Clahsen and Felser 2006). Some studies also suggest that factors such as working memory and grammatical similarity between languages should be taken into account when analysing language production errors (Foucart and Frenck-Mestre 2012). In the study conducted by Clahsen and Felser (2006), three groups of participants were examined: L1 adults, L1 children, and L2 adults. Results showed that L1 adults and L1 children were able to parse grammar constructions accurately, as they both adhered to syntax parsing rules. However, subtle differences observed in children were attributed to their not-fully-developed working memory. On the other hand, critical differences were found in the L2 adults' group, as their L1 had an influence on sentence processing, resulting in transfer errors. This highlights that the age of acquisition of the L2 and the level of proficiency can increase the number of errors in L2 production. For the present study, all participants were of age so that cognitive skills and working memory could be at a maturational level in order to avoid possible bias. However, it is important to note that individual differences may still be present in the study, as these capacities were not measured or controlled for within or between groups.

### 1.2. English and Spanish Possessives

Spanish possessives were frequently used five centuries ago (Company Company 2006), but their use has declined in certain contexts over time. For instance, Spanish used to employ possessives for body parts (e.g., "*le duele su cabeza*"), but now the more common form is "*le duele la cabeza*", whereas in English the possessive form "*his head hurts*" has always been used. However, Spanish children typically master possessives before the age

of four (Padilla and Lindholm 1976; Perez-Pereira 1991), and by that age, they can generally differentiate between masculine and feminine. Nonetheless, Spanish possessives can have various uses. They can function as adjectives or determiners (i.e., *mío, mía, tuya, nuestro...*), where they agree with the gender and number of the possessum that they precede or follow (e.g., “*nuestra casa*”, “*el libro vuestro*”). They can also function as pronouns, replacing the possessum while agreeing with its gender and number (e.g., “*este es mío*”, where “*mío*” can replace a masculine singular possessum such as *libro, perro, or tenedor*).

English and Spanish differ notably in their approach to possessive constructions. In English, possessive determiners (e.g., *my, your, his, her, its, our, their*) do not engage in syntactic gender agreement. Instead, these determiners often align with the gender of the referent when it signifies a person. For example, in “*She wants to go to her favourite café*”, the determiner “*her*” corresponds to a female referent. However, it is important to emphasize that English lacks syntactic agreement between the subject’s gender and the possessive determiner, as evidenced by the grammatical correctness of sentences like “*He wants to go to her favourite café*”. In contrast, Spanish uses gender-neutral possessive pronouns such as “*su*” that do not differentiate between male and female referents. The interplay of syntactic and semantic agreement, underlined by studies like that of Schoenmakers et al. (2022), is pivotal in understanding these differences. The concept of animacy further nuances this discussion. It is essential to differentiate between “*animate*” nouns, referring to sentient beings capable of movement, thought, and emotion, and “*inanimate*” nouns, which denote non-living entities or abstract concepts like “*time*” or “*rock*”. This differentiation serves as a foundational element of our study. English also uses possessive pronouns (*mine, yours, his, hers, its, ours, theirs*), which require agreement with the grammatical person and gender of the third person singular possessive (e.g., “*this house is hers*” when referring to Susan). Additionally, English uses the genitive construction (e.g., “*the dog of my father*”), which requires the particle “*of*” between the possessor and possessum. This construction is more common in Spanish since the language lacks a prenominal genitive. Spanish speakers use this possessive construction more frequently (e.g., “*El primo de mi padre*”) than English speakers, who tend to prefer the Saxon genitive over the genitive construction (e.g., “*my father’s cousin*” instead of “*the cousin of my father*”). Finally, English uses the Saxon genitive (e.g., “*my father’s dog*”), which attaches to the possessor and precedes the possessum (Seppänen 1980; Van Peteghem 2012).

To summarise, both languages require possessives to agree with the possessor in person (e.g., “*Tus lápices están ahí*” or “*Your pencils are there*”, both referring to the personal pronoun “*you*”), but gender and number agreement depend on different lexical and syntactic constructions in each language. For example, in the Spanish sentence “*Esta es su casa*”, it is impossible to determine whether the possessive refers to *his, her, its, or their* house, whereas in English, the possessive does agree in gender and number (“*This is his house*”). Among all types of possessives in both languages, Spanish speakers tend to make more gender errors with possessive determiners, hence the focus of this study.

In English, possessive forms are required when denoting body parts, personal belongings, and material possessions. In contrast, Spanish often adopts a structure using the definite article, leading to potential redundancy when overused (Antrim 1996; Losada-Durán 1991; Montoya 2011). When assessing Spanish speakers’ acquisition of English as a second language (L2), a notable phenomenon emerges: the overuse of possessive adjectives, particularly in the context of inalienable nouns like kinship terms. These terms are considered animate nouns. Montoya’s (2011) research provides valuable insights into this behaviour. It was observed that second-generation Spanish speakers in New York, even when primarily communicating in English, exhibit a pronounced tendency to use possessive adjectives with inalienable nouns compared to their first-generation peers. This pattern suggests the occurrence of syntactic transfer in the use of possessives, regardless of whether English is the dominant language or a secondary one.

In English, possessives are also used to avoid ambiguity. Without a possessive (e.g., “*the red car*”), it is unclear whose car is being referred to. In Spanish, possessives are only

used when the possessum is the subject of the sentence, and only to avoid ambiguity when multiple subjects are involved. Unlike in English, where only the third person singular possessive determiner agrees in gender with the possessor, possessive determiners in Spanish agree only in number with the possessum. This means that the possessor's gender is often ambiguous in Spanish, as in the phrase "*Sus casas son muy bonitas*". For instance, the possessive determiner "*sus*" in the aforementioned phrase can be rendered in English as either "*his houses are very beautiful*", "*her houses are very beautiful*", or "*their houses are very beautiful*", introducing a degree of ambiguity in the resulting English translation.

The pro-drop syntactic feature of Spanish (Sabourin and Stowe 2008), which allows for subject omission, can lead to errors in English possessives. For example, in the sentence "*Ella habla inglés muy bien*", meaning "*She speaks English very well*", the pronoun "*Ella*" is typically left out since "*habla*" inherently implies the third person singular due to its conjugation. Conversely, in English, subject pronouns are generally required because verbs, apart from specific exceptions in the present simple tense (e.g., he plays, she swims, it grows) and a few irregular verbs (e.g., am/is/are for "to be" or has for "have"), do not indicate the subject through their conjugation. This feature can make it difficult for Spanish speakers to express the gender of the possessor in English correctly. In summary, errors in English possessives made by Spanish speakers may be due to differences in gender assignment and agreement between Spanish and English possessives, as well as the fact that possessive determiners are not as commonly used in Spanish as in English. To use English possessives correctly, Spanish speakers must remember both the gender and person features of the possessor.

### 1.3. Production Tasks and Research on L2 Gender Errors

Errors due to deficient and abundant automatisations are typically found only in natural speech production, as studies examining comprehension and offline tasks generally show native-like performance for L2 speakers (Grüter et al. 2012; Lee-Ellis 2011). However, research on possessives has shown that while proficient L2 learners may perform at ceiling levels in comprehension tasks, they still make errors in elicited production tasks (Antón-Méndez 2011; Grüter et al. 2012; Pozzan and Antón-Méndez 2017). Gender agreement errors in possessives made by an English-as-a-foreign-language speaker do not arise from a lack of knowledge of English grammar rules for possessive determiners, but rather from the activation of relevant gender knowledge during real-time production (Kroll et al. 2008). This theory is supported by the fact that comprehension tasks consistently yield native-like results for L2 speakers, indicating that they have a solid understanding of how possessive determiners work in English. However, when it comes to real-time production tasks, L2 speakers often struggle to apply this knowledge, leading to errors in their use of possessive determiners.

Comprehension and production tasks impose different cognitive demands; production tasks require more working memory and cognitive control. Furthermore, producing an utterance involves automatic processes of formulation and articulation (Kormos 2006), which may lead to errors. Retelling an utterance can be a challenging cognitive procedure due to time pressure, possible fatigue, and lack of attention (Kovac 2011). Given the high cognitive demand of elicited production tasks, they can be considered appropriate indicators of L2 proficiency and can be used to investigate the occurrence of errors in real-time production.

Elicited production tasks have been the focus of studies such as Antón-Méndez (2011), Wolford (2006), and Santesteban et al. (2010) with Spanish students of English as a foreign language (EFL). These studies showed that participants make gender errors on elicited production tasks when possessive determiners precede animate possessums and the possessor and possessum do not agree in gender. In Antón-Méndez (2011), sixty-two L2 English speakers (Spanish, Italian, and Dutch speakers) carried out an elicited production task in English where they had to listen to utterances in the present tense and retell them in the past tense as if talking about somebody else, using the problematic third person

singular possessive. The study revealed a significant difference between Spanish and Italian speakers compared to Dutch speakers, who have a grammar more similar to English. Spanish and Italian speakers had more problems with mismatch sentences including animate nouns than with mismatch sentences including inanimate nouns due to the fact that only biological gender exists for animate nouns in both languages, but inanimate nouns do not have a grammatical gender in English (Vigliocco and Franck 1999). In the present study, both animate (e.g., father) and inanimate (e.g., apartment) nouns were used to test whether results like the ones seen in Antón-Méndez (2011) are supported or whether participants make gender errors regardless of the type of animacy of the possessum. This study aims to investigate whether proficiency level has an impact on the number of errors Spanish students of EFL make with animate possessums. Proficiency level was not tested in the studies above, so it is unknown whether the lower error rate seen with inanimate nouns in Antón-Méndez (2011) and Pozzan and Antón-Méndez (2017) was due to the lack of grammatical gender of these nouns in English or to participants' English proficiency. Additionally, only animate nouns were tested in Santesteban et al. (2010).

Match and mismatch sentences were used in both Santesteban et al. (2010) and Antón-Méndez (2011) to determine where participants make more errors. In Woldford (2006), a study conducted with early bilingual Spanish–English children, it was observed that children confused “his” and “her”, even when they learned both languages from birth. These children also used the English genitive construction (i.e., “the jacket of my father”) more frequently than possessive determiners, as the former is more common in Spanish. Studies with native English L2 Spanish speakers and native Turkish L2 English speakers have shown similar results, indicating that L2 possessive structures are influenced by the mother tongue (Balabakgil et al. 2015; Grüter et al. 2012). All of these results provide evidence that errors made in the L2 are due to L1 transfer from syntactic and lexical rules that do not apply in both L1 and L2, which is also reflected in a mixture of deficient and abundant automatisations (Antón-Méndez 2011; Truscott and Smith 2004; Garrod et al. 2014).

In the context of this study, the terms “match condition” and “mismatch condition” refer to the agreement or disagreement in gender between the possessor and possessum. The “match condition” pertains to sentences where the gender of the possessor and the gender of the possessum align, for example, “Brian went to the mall with his father” (both masculine). Conversely, the “mismatch condition” relates to sentences where there is a gender discrepancy between the possessor and the possessum, as in “Brian went to the mall with his sister” (masculine possessor, feminine possessum).

#### 1.4. The Current Study

This study aims to investigate gender agreement and assignment errors observed in Spanish native speakers during an elicited production task with different proficiency levels in L2 English. This study builds upon Antón-Méndez’s (2011) findings, which indicated persistent difficulty in acquiring the third person singular possessive determiner *his* and *her* in English for Spanish speakers, even among advanced L2 English learners. Native Spanish speakers were recruited for this study because previous research has shown that the use of *his* and *her* in production is challenging for them (Patterson 2002).

Unlike previous studies that compared participants with different native languages and involved repeating sentences with minor changes (see Santesteban et al. 2010; Antón-Méndez 2011; Pozzan and Antón-Méndez 2017), this study examines whether Spanish EFL learners differ in their gender errors due to their L2 proficiency level in generating new sentences in response to prompts. The study uses both animate and inanimate nouns in match and mismatch sentences to examine whether errors are more likely to occur in the latter. It is hypothesised that L2 English learners with lower proficiency levels will make more errors in the mismatch condition due to the increased cognitive demand of generating new sentences.

### 1.5. Research Questions and Hypotheses

The present study aimed to investigate the following research questions:

- RQ1. In which condition (match animate/match inanimate/mismatch animate/mismatch inanimate) will Spanish participants make more errors?
- RQ2. Will higher L2 proficiency levels result in fewer errors compared to lower L2 proficiency levels? If so, can we attribute fewer mistakes to higher L2 proficiency?
- RQ3. Is there a difference in the number of errors made depending on whether the possessor is masculine or feminine? If so, do higher L2 proficiency levels mitigate such differences?

Based on the literature review, we hypothesise that sentences with animate possessums that do not agree in gender with the possessor (mismatch condition, e.g., “*Brian went to the mall with his sister*”) will have higher error rates compared to those that do (match condition, e.g., “*Brian went to the mall with his father*”). Furthermore, we hypothesise that advanced L2 English speakers will make fewer mistakes than less proficient ones and will find it easier to correctly implement L2 grammar rules. These advanced L2 English speakers are expected to show lower error rates for both conditions, regardless of whether the possessums are animate or inanimate. Finally, we hypothesise that there will be a significant difference in the number of errors made based on the gender of the possessor.

Our hypotheses aim to shed light on whether transfer and a combination of deficient and abundant automatization can be observed when Spanish participants use their knowledge of grammatical rules when using possessives in English production.

## 2. Materials and Methods

### 2.1. Participants

In this study, a total of 43 participants were recruited, all of whom were native Spanish speakers (mean age = 29,  $SD = 6.2$ ) and for whom English was their second language. Posters were put up around the Division of Psychology and Language Sciences at the University College of London, where the study was conducted, in order to recruit participants. Most participants (86%) reported acquiring English mainly at school, or in their home country (i.e., Spanish-speaking countries), with a mean age of first exposure to English at 7.35 years old ( $SD = 4.023$ ). At the time of testing, all participants were living in London, United Kingdom, with a mean length of residence in an English-speaking country at 29.9 months ( $SD = 44.5$ ). Participants’ level of English proficiency was assessed using the Oxford Placement Grammar Test 2, a tool used to measure an L2 English speaker’s general language proficiency. Upon completion of the experiment, participants were compensated with a GBP 10 reward for their participation. Table 1 provides a summary of the participants’ characteristics.

**Table 1.** Descriptive statistics.

	Mean	Std. Deviation
Age (years)	29.0	6.2
Gender (female %)	60.5%	
Proficiency (OPT <sup>a</sup> )	66.7	14.8
English acquisition at setting environment (%)	86.0%	
L2 Immersion <sup>b</sup> (months)	29.9	44.5
Reading self-rating <sup>c</sup>	8	1.7
Writing self-rating <sup>c</sup>	6.9	1.7
Speaking self-rating <sup>c</sup>	6.8	1.8
Listening self-rating <sup>c</sup>	7.5	1.7

<sup>a</sup> Oxford Placement Test, as explained above. <sup>b</sup> Months spent in English-speaking countries where English was the official language. <sup>c</sup> Scale from 1 to 10, 1 meaning very poor and 10 meaning near-native.

## 2.2. Materials

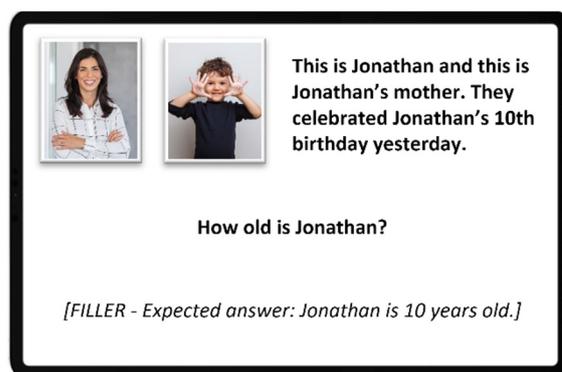
The researchers created a total of 120 short stories (examples of which are provided in Figures 1–3) to investigate whether English proficiency affects the production of his/her adjectives and whether gender matching between the possessor and the possessum (both animate and inanimate) has an impact on the number of errors made. Of the 120 stories, 80 were designed to elicit the use of his/her possessive determiners while the remaining 40 were fillers to prevent participants from guessing the aim of the study. The 80 stories for the *his/her* adjectives were divided into two sets of 40; one set featured animate referent nouns while the other set featured inanimate referent nouns. Each set of 40 stories was further divided into 20 stories with a gender match condition and 20 with a gender mismatch condition. All short stories were composed of two sentences, with an average length of 15 words and a range between 8 and 22 words. The first sentence introduced either two people (for animate referent noun trials) or a person and an inanimate noun (for inanimate referent noun trials), and the second sentence provided additional information related to the first sentence. To create a gender match or mismatch condition, every first sentence was presented with two photographs on the screen. For the 40 short stories with animate referent nouns, the photographs depicted two individuals, resulting in a match condition if the possessor and the possessum genders agreed (e.g., “*This is Elisabeth and this is Elisabeth’s aunt*”, where both *Elisabeth* and *aunt* share the same gender) or a mismatch condition if they disagreed (e.g., “*This is John and this is John’s mother*”, where *John* and *mother* differ in gender). The same procedure was carried out for the 40 short stories with inanimate referent nouns, using the grammatical gender of the Spanish noun to create a match (e.g., “*Marc had a coat*”, as both *Marc* and *coat* are masculine in Spanish) or a mismatch condition (e.g., “*Gabriel wrote a song*”, as *Gabriel* is masculine, but *song* is feminine in Spanish), since English nouns, whether animate or inanimate, do not have grammatical gender.



Figure 1. Examples of animate conditions.



Figure 2. Examples of inanimate conditions.



**Figure 3.** Example of a filler.

The researchers created two lists of 120 short stories in total: 80 stories were designed to elicit the use of possessives, with 40 featuring an animate referent noun and the other 40 featuring an inanimate referent noun. Within each set of 40 stories, 20 had a match condition (where the possessor and possessum genders agreed) and the other 20 had a mismatch condition (where they disagreed). The remaining 40 stories were fillers that had a similar structure to the target stories but did not require the use of possessives. For example, “*This is John and Anthony. They went fishing by the reservoir last weekend. When did John and Anthony go fishing?*” To create the two lists, the 80 target stories were equally divided between them, with each list containing 40 fillers, 10 stories with an animate noun and match condition, 10 with an animate noun and mismatch condition, 10 with an inanimate noun and match condition, and 10 with an inanimate noun and mismatch condition. Both lists were counterbalanced to ensure that they had an equal number of stories and the same type of stories.

The match and mismatch conditions were based on the gender of the possessor (the individual in the photograph) and the gender and nature of the possessum (the referent noun). The possessums were either animate (e.g., *sister, brother*) or inanimate (e.g., *trumpet, jacket*) and could be feminine (e.g., *grandmother, song*) or masculine (e.g., *father, coat*). The gender of the inanimate nouns was determined by the grammatical gender of their Spanish translation, as English inanimate nouns do not have a gender. To ensure consistency across different Spanish dialects, the translation of each noun was checked by three native Spanish speakers. Additionally, the English proper names of the people in the photographs were checked by both English and Spanish speakers to ensure that Spanish speakers were familiar with the names and their gender. To avoid repeating any animate noun, compounds of typical animate nouns (e.g., *mother*) were used instead (e.g., *stepmother, mother-in-law*, etc.). Inanimate nouns were also checked to ensure that participants were familiar with their meaning.

Before starting the task, participants were given four practice sentences to familiarise themselves with the task. Each sentence was recorded by a Southern British native English speaker in a soundproof studio, as this was the accent that participants were exposed to, given that they were residing in London.

### 2.3. Procedure

Participants were recruited through various methods, including online advertisements, word-of-mouth, and the psychology pool of the Language Sciences faculty at UCL. Each participant was tested individually in a quiet room. Prior to conducting the experiment, a questionnaire on possessive determiners in English was administered to ensure that any gender errors with third person singular possessives “*his*” and “*her*” were not related to a lack of grammar knowledge, but rather to transfer issues. The questionnaire consisted of 24 sentences, such as “*Robert called \_ sister to say happy birthday*”, where participants had to choose between “*his*”, “*her*”, or “*their*” to fill in the blank. Eight of the sentences were fillers, such as “*The children proudly put \_ drawings on the table*”. The results of the

questionnaire showed ceiling effects, with 98.5% of responses being correct. This supports previous research suggesting that Spanish speakers do not make gender errors with possessives due to a lack of grammar knowledge, rather than because of a production problem (Slevc et al. 2007). As a comprehension task would not have been sufficient to identify gender errors caused by a mixture of deficient and abundant automatised, one was not included in this study. After completing the questionnaire, participants began the experiment. The stimuli were presented using the *E-Prime 2.0* experiment software on a Windows operating system. Short stories were presented to participants via headphones, and corresponding pictures were displayed on a computer screen. Participants' responses were recorded using a microphone.

The experiment proceeded as follows: Participants were provided with a consent form and asked to fill in a personal questionnaire which included questions about their English exposure and self-ratings of reading, writing, speaking, and listening skills. They then completed the *Oxford Placement Grammar Test 2*, a 30-min test consisting of 100 questions with a maximum possible score of 100 points. Prior to the experiment, participants were given instructions on the screen and any doubts were clarified in Spanish. Once they confirmed their understanding, the task began. A fixation point (a cross) was presented on the screen, followed by two photographs of either two people or one person and one object on a white background, while a sentence was played through headphones to the participants. The images disappeared after seven seconds, and a question about the vignette appeared on the screen for fifteen seconds, during which the participant answered the question aloud, and their response was recorded for transcription later. The experimenter pressed the spacebar to proceed to the next short story as soon as the participant responded, and if the participant took more than 15 s to answer, the next trial was automatically displayed.

Participants were instructed to provide a full sentence answer to prevent them from avoiding the use of possessives, and most trials, including fillers, were in the past tense. This was done to distract the participants from the use of possessives, as it was the only grammar component they were required to use in their answers. Table 2 provides examples of questions and their expected answers.

**Table 2.** Examples of the experimental and filler questions with their expected answers.

Possessum	Question Example	Expected Answer
Match Animate	Who did Amy go to the park with?	Amy went to the park with her niece.
Match Inanimate	What did Andrea want to publish?	Andrea wanted to publish her poem.
Mismatch Animate	Who did Brian go to the mall with?	Brian went to the mall with his sister.
Mismatch Inanimate	What did Valerie lend to a friend?	Valerie lent her apartment to a friend.
Filler	Which subject did Helen have an exam in?	Helen had an exam in biology.

Finally, participants were debriefed to determine if they had guessed the goal of the experiment. As none of them associated the experiment with the correct use of possessives, all data were included in the study analysis.

#### 2.4. Analysis

To test the effect of L2 proficiency on possessive use, data on the responses to each of the 40 sentences were collected and used to create several dependent variables, including errors in match, mismatch, animate, inanimate, match animate, match inanimate, mismatch animate, mismatch inanimate, masculine agreement, and feminine agreement. Linear

regression analyses were then performed to assess the relationship between L2 proficiency (measured by the *Oxford Placement Grammar Test 2* scores) and the number of errors made for each condition. Independent sample *t*-tests were also conducted to determine if there were any differences in the number of errors made due to animacy, condition, and gender of the possessor.

Bivariate correlations were first computed to explore relationships between variables, and several statistically significant correlations between L2 skills and other measured variables were found. Multivariate linear regressions were then carried out to investigate the predictive strength of English proficiency on the number of L2 gender errors. All analyses were performed using SPSS 22.0 statistical software with a significance level of 0.05. Key assumptions of the linear regression model, including normality, linearity, homoscedasticity, and absence of multicollinearity and autocorrelation, were checked and confirmed using the approach recommended by Baños, Fonseca, and Álvarez (Vilà Baños et al. 2019).

### 2.5. Scoring Reliability

Participant responses were transcribed and coded as correct or incorrect based on their use of the third person singular possessive *his/her* in all conditions. There were some answers coded as “det” (i.e., determiner) whenever the participant used a determiner instead of a possessive (e.g., “Anna bought a backpack” instead of “Anna bought her backpack”). Some answers were also coded as “rel” (i.e., relative clause), whenever the participant answered with a relative clause instead of using the possessive (e.g., “He sold 10 copies of a book that he wrote” instead of “He sold 10 copies of his book”). Finally, some answers were coded as “N/A” (i.e., no answer) whenever the participant did not provide an answer at all, and on rare occasions they were coded as “other” if the answer was ungrammatical (e.g., “with mother”). All of these answers were considered neither correct nor incorrect for the purposes of the study. Conversely, if participants used different referent nouns in their answers (e.g., “father” for “grandfather” or “viola” for “guitar”), the answer was coded as correct as long as the grammatical gender of the alternative referent noun corresponded to the original referent noun gender (both of the above examples would be correct as “father” and “grandfather” are masculine, and “viola” and “guitar” are feminine in Spanish). In summary, answers where the gender of the possessive agreed with the possessor’s gender were coded as correct, while those with disagreement were coded as incorrect.

## 3. Results

We calculated the accuracy rates for each condition and animacy by determining the proportion of correct responses (i.e., those using the correct *his/her* possessive determiner) out of the total number of correct and incorrect responses. Responses to filler items were excluded from the analysis, as were responses that did not include a possessive determiner (“det”, “rel”, or “other” responses, as previously explained). Of the 1720 total responses, 937 were correct (54.5%), 225 were incorrect (13.1%), and 482 were determiners (28%), which is the default type of word that Spanish speakers often use instead of possessives. The remaining 76 responses (4.4%) were coded as “rel”, “not answered”, or “other”. It should be noted that the use of determiners (e.g., “Stella left her coat at the bar” vs. “Stella left the coat at the bar”) was not considered correct or incorrect, as it is grammatically valid.

### 3.1. The Effect of Condition on Possessive Agreement Accuracy

In order to explore whether condition has any effect on possessive agreement accuracy, i.e., whether participants make more errors in the use of the possessive *his/her* depending on whether they agree in gender with the possessor (match condition, e.g., “Mary went to have dinner with her sister”) or if they do not (mismatch condition, e.g., “Mary went to have dinner with her brother”), a one-sample *t*-test was performed. The results reflect that Spanish learners of English made more mistakes in the mismatch condition, where the possessor gender and the possessum gender did not match, ( $M = 3.21$ ,  $SD = 2.253$ ),  $t(42) = 9.342$ ,  $p = 0.000$ ,

95% CI (2.52, 3.90), than in the match condition ( $M = 1.47$ ,  $SD = 1.279$ ),  $t(42) = 7.512$ ,  $p = 0.000$ , 95% CI (1.07, 1.86). Furthermore, the effect size ( $d = 8.923$ ) suggests that Spanish EFL learners are much more likely to make a mistake in the use of the masculine or feminine adjective when the possessor does not agree with the gender with the possessum.

### 3.2. The Effect of Possessor's Gender on Possessive Agreement Accuracy

In order to explore whether the gender of the possessor has any effect on possessive agreement accuracy, i.e., whether there is any difference in agreement accuracy when "his" (e.g., "John went out with his sister") or "her" (e.g., "Mary went out with her brother") must be used, a one-sample  $t$ -test was performed. The results reflect that Spanish learners of English made more mistakes when the use of the feminine possessive determiner was mandatory ( $M = 3.74$ ,  $SD = 2.821$ ),  $t(42) = 8.704$ ,  $p = 0.000$ , 95% CI (2.88, 4.61) than when the use of the masculine adjective was grammatically correct ( $M = 1.77$ ,  $SD = 2.057$ ),  $t(42) = 5.635$ ,  $p = 0.000$ , 95% CI (1.13, 2.40). The effect size ( $d = 0.958$ ) also indicates that Spanish EFL learners are much more likely to make mistakes in gender agreement when they need to use "her" rather than "his".

### 3.3. The Effect of L2 Proficiency on Possessive Agreement Accuracy

To investigate whether proficiency in English can predict the number of errors in the use of the masculine and feminine possessive determiners made by L2 speakers, different linear regression analyses were performed to test the effect of the participants' tested proficiency in English ( $M = 66.70$ ,  $SD = 14.788$ ) on the different types of errors. As stated earlier, errors in (i) match, (ii) mismatch, (iii) animate, (iv) inanimate, (v) match animate, (vi) match inanimate, (vii) mismatch animate, and (viii) mismatch inanimate conditions, as well as in (ix) masculine agreement, and (x) feminine agreement were computed as dependent variables.

The participants' L2 proficiency in English showed statistically significant effects on the overall number of errors ( $\beta = -0.435$ ,  $R^2 = 0.189$ ,  $F[1,41] = 9.552$ ,  $p = 0.004$ ), the match condition ( $\beta = -0.429$ ,  $R^2 = 0.184$ ,  $F[1,41] = 9.240$ ,  $p = 0.004$ ), the mismatch condition ( $\beta = -0.348$ ,  $R^2 = 0.121$ ,  $F[1,41] = 5.631$ ,  $p = 0.022$ ), the animate condition ( $\beta = -0.377$ ,  $R^2 = 0.142$ ,  $F[1,41] = 6.810$ ,  $p = 0.013$ ), the inanimate condition ( $\beta = -0.400$ ,  $R^2 = 0.160$ ,  $F[1,41] = 7.816$ ,  $p = 0.008$ ), the match animate condition ( $\beta = -0.441$ ,  $R^2 = 0.194$ ,  $F[1,41] = 9.874$ ,  $p = 0.003$ ), the mismatch inanimate condition ( $\beta = -0.450$ ,  $R^2 = 0.202$ ,  $F[1,41] = 10.389$ ,  $p = 0.002$ ), and the number of errors made when the possessor is masculine ( $\beta = -0.366$ ,  $R^2 = 0.134$ ,  $F[1,41] = 6.356$ ,  $p = 0.016$ ). On the contrary, the factor "proficiency in English" did not appear to be a predictor of the number of errors made in the match inanimate ( $\beta = -0.140$ ) and mismatch animate ( $\beta = -0.247$ ) conditions, nor when the possessor is feminine.

## 4. Discussion

In this study, we aimed to answer the first research question by investigating whether Spanish EFL learners make more errors in mismatch conditions, which has been observed in previous studies. For instance, [Antón-Méndez \(2011\)](#) found that Spanish, Italian, and Dutch speakers who learned English as a second language made more mistakes with animate nouns than with inanimate ones when producing third person singular possessives. Similarly, [Pozzan and Antón-Méndez \(2017\)](#) discovered that both Chinese children and adults who learned English as a second language tended to make gender agreement errors in possessives. This might seem counterintuitive given that Chinese lacks gender-based L1 agreement rules akin to those in Spanish. Nevertheless, the underlying cause of these errors among Chinese speakers can be attributed to Mandarin's third person singular possessives, which, much like Spanish, do not differentiate gender between the possessor and the possessum. An example of this is the Mandarin phrase "tā de fùqīn", which can translate to both "her father" and "his father" in English ([Pozzan and Antón-Méndez 2017](#)). Another study by [Santesteban et al. \(2010\)](#) demonstrated that Spanish and French speakers

made more errors with possessive determiners due to the influence of their L1 agreement rules on the processing of gender agreement in English.

Our study confirms that Spanish EFL learners tend to make more mistakes in the mismatch condition, regardless of their English proficiency. We should note that participants responded with either *his* or *her* preceding the animate noun in all utterances where animate nouns were included, and the responses were deemed correct or incorrect depending on whether they made a gender error. However, with inanimate nouns, they mainly responded with a determiner preceding the noun, possibly due to transfer from L1 syntax to L2. Consequently, they generally did not make any mistakes in the few utterances where they used the possessive determiners *his* or *her* preceding the inanimate noun. This limitation should be addressed in future studies by precluding the elicitation of determiners. Spanish, as well as other Romance languages, has gender and number agreement between determiners and the nouns that follow. However, the third singular person possessive “*su*” is ambiguous most of the time as the same possessive is used for both masculine and feminine. In English, there is number agreement, but gender agreement is only marked for the third person singular (*his/her/its*). It was suggested that when grammatical gender or number rules differ between languages, transfer from one language to the other negatively occurs due to a deficient automatised. According to the results of this study, as the gender agreement does not correspond between English and Spanish grammars, transfer from the participants’ L1 to their L2 fails to occur, and errors are consequently made.

Our results also suggest that both advanced and intermediate L2 English speakers make gender errors regardless of the conceptual gender of the possessums. While previous research indicates that participants make mistakes in all mismatch conditions, further investigation is needed to determine whether a mismatch animate condition has more power. A larger sample size could have provided more data to identify where advanced and intermediate L2 English speakers make more errors.

To provide further insights into the percentage of errors L2 speakers generally make with possessives in this type of task, including a monolingual English group as the control group would have been beneficial. Studies have shown that English speakers also make mistakes with this grammatical feature, particularly with animate nouns, which are less common in English than in other languages. This suggests that while English speakers make gender errors at a conceptual or lexical level, Spanish speakers with L2 English may make them at a syntactic level. However, this hypothesis requires verification in a larger sample of participants from both languages using a similar task to the one described in this study.

With regard to our second hypothesis, the results suggest that sentences containing animate possessums that do not agree in gender with the possessor (mismatch condition) have higher error rates. Both groups of participants differed in the amount of errors made, with the intermediate L2 English speakers making more errors. However, even advanced L2 English speakers showed gender agreement errors, highlighting the influence of second language cross-linguistic effects. These findings could explain the use of only animate nouns in Santesteban et al.’s (2010) study. However, they do not support the results seen in both Pozzan and Antón-Méndez’s (2017) and Antón-Méndez’s (2011) studies, where Spanish participants had a higher error rate with sentences containing animate possessums that did not agree in gender with the possessor (mismatch condition) than with inanimate nouns in the same condition.

As our second hypothesis suggested, Spanish speakers with an intermediate level of English produced more errors than those with an advanced level of English. This result may suggest a proficiency effect, which is consistent with our predictions and previous research (Marchman et al. 2010; Lee-Ellis 2011). The results of this study support transfer in both groups, as found in previous research results. However, it is recommended to conduct future research to provide evidence that the higher the proficiency level of the participants, the lower the error rates. Additionally, future research will explore whether participants who started learning their L2 in a setting environment differ from those who

started learning both languages from birth. Native English participants will participate as the control group. This could shed light on bilingual language production theories by testing whether the age of acquisition of the L2 plays a crucial role or not in production tasks dealing with gender errors, as well as whether errors rely more on the proficiency effect or on transfer from L1 to L2.

The results of this study suggest that there is a competition between the mother tongue and the second language when producing an utterance in the second language, supporting our second hypothesis. This competition has been explained as inhibitory effects, where the mother tongue switches off when producing an utterance in the second language and vice versa (Sabourin and Stowe 2008; Kovac 2011). This has been verified in cases where participants had a proficient mastery in their L2. However, Green (1986) and Truscott and Smith (2004) suggested that L1 inhibition depended on the degree of proficiency of the L2 speaker, and that L1 interference could be avoided when the L2 speaker was highly proficient. Additionally, Radman et al. (2021) suggested that L1 inhibition may also be influenced by the distance between the two languages. However, Cargnelutti et al. (2022) argued that the former may have a greater effect than the latter and suggested that more research is needed on the linguistic distance between languages. These new findings should be taken into account in future research on L1 inhibition.

The results of this study do not fully support Green's claims (1986), as it could be argued that the English proficiency of the L2 advanced group was not high enough to inhibit their L1 (Spanish) from influencing their responses in English. This may explain the presence of errors in both groups. Possessive errors were previously attributed to conceptual processing, where nouns with intrinsic gender were more error-prone than those without intrinsic gender (Antón-Méndez 2010). However, our results suggest that errors could also be syntactically driven, as Spanish and English differ in possessive agreement. In Spanish, the third singular person possessive "su" agrees with the gender of the possessums, whereas in English, "his/her/its" agrees with the gender of the possessor. In addition, inanimate nouns in English lack grammatical gender. The absence of a mismatch effect with English inanimate nouns in our results suggests that interference may be due to syntactic processing rather than conceptual processing. Future research on gender errors with possessives should consider including inanimate nouns in elicited production tasks.

There are two conditions that were not controlled for in this study: the origin of the participants and their experience in the L2 environment. English is not taught the same way in different Spanish-speaking countries, and participants' experience in the L2 environment could affect their proficiency level. To address these limitations, future studies could include participants from different Spanish-speaking countries and analyse characteristics such as frequency of L2 use and the conditions in which the L2 is used to evaluate proficiency level more accurately. In addition, the *OPT* test may not be the most accurate measure of proficiency, and future research could consider using other measures such as exposure to English in conjunction with the test.

It should be noted that the pre-experiment questionnaire completed by the participants showed ceiling effects, which supports the view of deficient automatization. This view suggests that even if L2 speakers have learned the grammar rule, the lack of need for gender agreement with possessives in L1 makes it challenging for them to correctly implement this feature in L2 production. Furthermore, no bias was found in guessing the goal of the experiment after completing the task. Participants were asked about their guesses, and none mentioned possessives, but rather the word order in English or past tense errors.

The default "he" in Spanish is also an important consideration (Vigliocco and Franck 1999; Alpher 1987), as Spanish speakers tend to make more errors when using the masculine possessive "his" due to the default use of the masculine gender. Out of 1162 "his" or "her" responses, 57.3% were "his" responses and 42.7% were "her" responses. Additionally, mistakes due to the use of the masculine gender accounted for 36.3% of errors, whereas mistakes due to the feminine gender accounted for 15.7%. These percentages confirm our hypothesis and support previous research on Spanish speakers' tendency to use the

masculine gender default when using possessive determiners. The study also found a higher percentage of mistakes when using “his” for animate nouns (31.2%) than for inanimate nouns (4.6%). However, L2 proficiency levels did not mitigate this difference, as the factor “proficiency in English” did not appear to predict the number of errors made with feminine possessors and mistakenly using the possessive “his”. Further research may be needed to determine whether this misuse of the masculine gender is mainly caused by the masculine gender default used in Spanish or due to conceptual or syntactic processing during adjective selection.

This study confirmed the second hypothesis, demonstrating that producing utterances with the same or different gender possessors and possessums makes a difference in the L2 English production of Spanish native speakers. Additionally, the present results suggest that higher L2 proficiency levels lead to fewer mistakes with possessive determiners. Future research should consider the heterogeneity of participants in L2 studies, considering their backgrounds, origins, and experiences. Despite the need for further research, this study helps confirm the transfer between L1 Spanish and L2 English in possessive determiner processing, with implications for L2 error causes related to deficient and abundant automatization. The results also support the use of elicited production tasks to study L2 errors, although future research should consider the use of large samples to detect significant interactions.

In light of our findings, several avenues for future exploration emerge. Firstly, examining the neurological underpinnings of gender agreement errors, through modalities like fMRI (functional magnetic resonance imaging) or EEG (electroencephalography), could provide pivotal insights into cognitive processes during ‘match’ and ‘mismatch’ conditions. Simultaneously, understanding the sociolinguistic factors impacting bilingual speakers, such as the influence of their dominant language or their immersion environment, can lend depth to our comprehension. From a pedagogical standpoint, these insights set the stage for creating tailored teaching strategies that specifically target gender agreement challenges. Evaluating the efficacy of such interventions would be a valuable contribution to the field, aiding educators and learners alike.

## 5. Conclusions

Overall, this study provides evidence that L1 transfer occurs in L2 English production for Spanish speakers, even at proficient levels. Although the exact reasons for this interference cannot be determined, syntactic transfer does occur, specifically with respect to possessive determiner structures. The findings demonstrate that gender agreement errors are not random, and that a higher error rate is observed when the possessor and possessum genders do not agree (mismatch condition). This suggests that production gender errors in Spanish L2 English speakers are made at the syntactic level, providing support for both the deficient and abundant automatization procedures that contribute to persistent gender errors in the Spanish population. Furthermore, the results indicate that gender errors are predominantly found in production, underscoring the importance of using elicited production tasks to investigate gender errors. Additionally, the findings highlight the importance of L2 proficiency level, as higher proficiency levels are associated with more native-like results and lower error rates. In conclusion, this study offers insights into L1 transfer in L2 English production for Spanish speakers and suggests that syntactic transfer is a significant factor in possessive determiner gender agreement errors. The findings have important implications for language acquisition research and demonstrate the relevance of elicited production tasks in studying gender errors. Additionally, the results underscore the importance of considering L2 proficiency levels in language acquisition studies. In summary, this research sheds new light on the gender agreement challenges faced by Spanish speakers learning English, providing valuable insights for both the academic community and educators. Our findings have the potential to shape tailored teaching strategies, enhancing language instruction effectiveness. By linking our empirical findings

with pedagogical practices, we aim to foster more efficient and learner-centric language education environments.

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