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Linguistic factors modulating gender assignment in Spanish–English bilingual speech

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Research Article

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Abstract

Drawing on naturally-occurring bilingual speech from a well-defined codeswitching community in Southern Arizona, this study examined the influence of semantic gender (a.k.a. biological gender), analogical gender, and other-language phonemic cues in modulating gender assignment in Spanish–English codeswitched speech. Thirty-four Spanish–English early bilinguals completed a forced-choice elicitation task involving two codeswitching environments: Spanish determiner–English noun switches (Task 1) and English–Spanish switched copula constructions (Task 2). The results revealed that for human-denoting nouns, bilinguals assigned grammatical gender based on the presupposed sex of a noun's referent in both syntactic environments tested. As for inanimate nouns, bilinguals were more likely to assign masculine over feminine gender to such nouns in determiner–noun switches, but not in switched copula constructions. Other-language phonemic cues did not influence the assignment mechanism. A methodological implication is that the study replicated the codeswitching patterns observed in naturally-occurring bilingual speech from the same bilingual community.

Introduction

A unique feature of bilingual communication is that many bilinguals intentionally and fluidly alternate between languages when interacting with other bilinguals. This hallmark of bilingual speakers is known as CODESWITCHING, and occurs at particular syntactic or prosodic boundaries (Bullock & Toribio, 2009; Torres Cacoullos & Travis, 2018; Poplack, 1980; Zentella, 1997). For instance, codeswitching at the det(erminer)–noun syntactic juncture illustrated in (1) is a prevalent linguistic behavior among Spanish–English bilinguals; these examples were taken from the *Corpus del Español en el Sur de Arizona* (The CESA Corpus, Carvalho, 2012).

(1) (a) y siempre tenía **un wand** […] pero él cargaba **el wand**
and always have-IMP.3SG a.**M** wand […] but he carry-IMP.3SG the.**M** wand
'and he always had a wand […] but he would carry the wand' (CESA020)
(b) él hasta a veces lo saco sin **la leash**
'he [a dog] sometimes CL.ACC take-PST.1SG out without the.**F** leash'
'sometimes I even take him [the dog] out without the leash' (CESA028)

An intriguing linguistic property of the codeswitched junctures in (1) is that the English words *wand* in (1a) and *leash* in (1b) are assigned to the masculine (M) and feminine (F) Spanish gender categories, respectively. The sorting of nouns into two (or more) gender categories demonstrated in (1) is known as *gender assignment* in linguistic research (Corbett, 1991; Comrie, 1999). The syntactic dependencies that different gender categories trigger upon agreeing targets like determiners and/or adjectives serve as a bootstrap for the establishment of gender assignment in a speaker's mental grammar, whether or not this mental grammar is bilingual (Corbett, 1991; Cruz, 2021; Delgado, 2018; Poplack, Pousada & Sankoff, 1982). Because Spanish exhibits grammatical gender and English does not, this raises the question of how bilinguals assign gender to English nouns occurring in Spanish–English codeswitched speech. In the case of the switched syntactic junctures in (1), gender assignment is overtly expressed in the corresponding Spanish determiners 'el' and 'la' to the English nouns *wand* and *leash*. Gender can also trigger agreement via a Spanish adjective marked for gender in English–Spanish switched copula constructions (e.g., *I'm not terca* 'stubborn-F') (Pfaff, 1979; Woolford, 1983).

Codeswitching is tied to social and pragmatic bilingual community norms, and it remains primarily a spoken language phenomenon (Bullock & Toribio, 2009; Torres Cacoullos & Travis, 2018; Zentella, 1997). However, researchers agree that experimental techniques that are carefully designed to reflect the codeswitching behavior of a well-defined codeswitching community can serve as a complementary source of valuable data for a better characterization

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of the bilingual lexicon and the bilingual experience more generally (Beatty-Martínez, Navarro-Torres & Dussias, 2020; Beatty-Martínez, Valdés Kroff & Dussias, 2018; Beatty-Martínez & Dussias, 2017; Gullberg, Indefrey & Muysken, 2009; Guzzardo Tamargo, Valdés Kroff & Dussias, 2016; Munarriz-Ibarrola, Ezeizabarrena, de Castro Arrazola & Parafita Couto, 2021; Valdés Kroff, Dussias, Gerfen, Perrotti & Bajo, 2017; Valdés Kroff & Fernández-Duque, 2017).

Spanish–English bilingual speakers who live and work in Southern Arizona, U.S. are well-known to engage in habitual codeswitching practices (Besset, 2017; Casillas, 2013; Cruz, 2016, 2018; DuBord, 2004; Kern, 2019). Drawing on naturally-occurring bilingual speech from this well-defined codeswitching community in Southern Arizona, in the present experimental study I examine the linguistic information that Spanish–English bilinguals who live and work in this bilingual community may deploy when asked to assign Spanish gender to English nouns in experimentally elicited responses to Spanish det–English noun switches (e.g., ***el/la*** *key* 'the.M/F') and English–Spanish switched copula constructions (e.g., *The key está rot-**o/a*** 'is broken-M/F'). I focus on three linguistic factors previously identified to modulate gender assignment in such syntactic environments: semantic gender (or the presupposed sex of a noun's referent) and analogical gender (or the gender of the Spanish translation equivalent). Assuming that analogical gender is applied, I also ask whether the /o/-/a/ phonemic cues that strongly correlate with gender assignment in Spanish (Teschner & Russell, 1984) influence the assignment mechanism applied in codeswitched speech.

This experimental study aims to supplement the spontaneously elicited data from the CESA Corpus reported in Cruz (2021). By doing so, the study seeks to provide a better characterization of the codeswitching practices and language use of a well-defined codeswitching community in Southern Arizona. This experimental design may also shed new light on how representative experimental research is of naturally-occurring codeswitched speech.

The distribution of gender assignment in Spanish and English

Gender assignment is fundamentally about sorting nouns into different gender categories (or noun classes) on the basis of linguistic properties that correlate with gender assignment such as animacy and/or humanness; this assignment mechanism can also operate in an arbitrary fashion with artifacts (Corbett, 1991; Kramer, 2015).[1] Spanish and English, the languages that concern us here, exhibit different distributional pattens in terms of gender assignment. In particular, Spanish has a binary-gender system in which every noun is assigned to the masculine (M) or feminine (F) gender categories, and the distribution of these gender categories is approximately equal in the Spanish lexicon (53% masculine, 47% feminine) (Teschner & Russell, 1984). While most Spanish nouns are presumably assigned gender arbitrarily (Harris, 1991), some phonemes strongly correlate with gender assignment in this language. For example, Spanish nouns ending in the phoneme /o/ are masculine in 99.87% of cases (*el libr**o*** 'the.M book') and those ending in the phoneme /a/ are feminine in 96% of cases (*la mes**a*** 'the.F table'), respectively (Teschner & Russell, 1984).

In fact, Spanish-speaking children are sensitive to the /o/-/a/ phonemic gender contrast when determining the gender of a Spanish noun or a novel word with Spanish phonotactics (Mariscal, 2008; Lindsey & Gerken, 2012; Pérez-Pereira, 1991). Similarly, Spanish second language (L2) learners and heritage speakers exploit such gender cues when establishing gender assignment/agreement in Spanish (Alarcón, 2011; Montrul, Foote & Perpiñán, 2008). Therefore, in the present study I take a step further and ask whether the /o/-/a/ gender cues of the Spanish translation equivalents influence how Spanish–English bilinguals assign gender to English nouns occurring in elicited responses to Spanish–English codeswitched speech. It is important to mention that this potential assignment strategy should not be confused with a 'shape-based assignment strategy' where the phonemic make of the switched noun, and not the phonemic make up of the translation equivalent of the switched noun, serves as a cue to gender assignment in codeswitched speech (e.g., see Munarriz-Ibarrola et al., 2021).

English, on the other hand, has a pronominal gender system whereby pronouns agree with the presupposed sex of human referents (e.g., *The doctor said **she/he** could see me tomorrow.*) (Corbett, 1991; Comrie, 1999). Moreover, English has a handful of human-denoting nouns that are morphologically marked for feminine gender (e.g., *actress, princess, duchess*, etc.) (McConnell-Ginet, 2013). English then has a pronominal gender system which operates on the basis of the presupposed sex of a noun's referent, but grammatical gender is absolute with non-human referents.

Gender assignment strategies in spontaneously elicited bilingual speech

Gender assignment in codeswitched speech is a promising research agenda in bilingualism (Balam, 2016; Jake, Myers-Scotton & Gross, 2002; Herring, Deuchar, Parafita Couto & Moro Quintanilla, 2010; Parafita Couto, Munarriz, Epelde, Deuchar & Oyharçabal, 2015; Pfaff, 1979, among many others). The main question in this line of research is how bilingual speakers determine the grammatical gender of an otherwise genderless noun occurring in switched determiner phrases, as illustrated in (1). In (2), I list the most commonly-attested gender assignment strategies that may promote gender assignment in spontaneously elicited codeswitched speech (see Bellamy & Parafita Couto, 2022 for comprehensive review):

(2) Gender assignment strategies in spontaneously elicited codeswitched speech
   (a) A semantic gender assignment strategy (a.k.a. biological gender) where the presupposed sex of a noun's referent determines the grammatical gender of human-denoting nouns occurring in codeswitched speech.
   (b) A gender transfer strategy in which the genderless noun is assigned the grammatical gender of its translation equivalent (a.k.a. analogical gender).
   (c) A shape-based assignment strategy in which some phonemic cues of the otherwise genderless noun occurring in codeswitched speech correlate with a certain gender category in the gendered language.
   (d) A default assignment strategy attributed to bilingual community norms rather than the internal mechanisms of gender assignment in the gendered language.

[1]Following this definition of gender assignment, throughout this paper I may interchangeably refer to gender as either (a) how speakers assign a gender to nouns or (b) which nouns go to into which gender category.

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While the assignment strategies in (2) are well-attested across bi-/multilingual communities, they are not representative of a specific bilingual community. For instance, Spanish–English bilinguals in the Bangor Miami Corpus (Deuchar, Davies, Herring, Parafita Couto & Carter, 2014) overwhelmingly adopted a masculine default assignment strategy even with human-denoting nouns (Valdés Kroff, 2016), whereas Spanish–English bilinguals from the New Mexico Spanish–English Bilingual Corpus (Torres Cacoullos & Travis, 2018) applied semantic gender as defined in (2a) in a categorical fashion with human nouns (Trawick & Bero, 2021). The default assignment strategy defined in (2d) is a prevalent codeswitching behavior across Spanish–English bilingual communities in the U.S. and has been found to be present as early as age seven for Spanish–English bilingual children (Balam, Lakshmanan & Parafita Couto, 2021). The shape-based assignment strategy defined in (2c) is attested in spontaneous Spanish–Basque codeswitched speech (Parafita Couto et al., 2015) and further confirmed in experimental settings in the same language pair (Munarriz-Ibarrola et al., 2021).

Gender assignment in the spontaneous codeswitched speech of a Spanish–English bilingual community from Southern Arizona, U.S. is particularly relevant for the purpose of the present study. Spanish is in consistent contact with English in Southern Arizona, and Spanish–English bilinguals who live and work in this geographical region are well-documented to engage in codeswitching practices on a daily basis (Besset, 2017; Casillas, 2013; Cruz, 2016, 2018; DuBord, 2004; Kern, 2019). A large sample of Spanish–English bilingual speakers from this well-defined codeswitching community is documented in the CESA Corpus (Carvalho, 2012). Recently, Cruz (2021) examined gender assignment in Spanish det–English noun switches (e.g., *el wand* 'the.M') in 76 sociolinguistic interviews of approximately one hour each from the CESA Corpus. Fifty-three Spanish–English bilinguals from the 76 interviews analyzed in Cruz's study produced Spanish det–English noun switches. These bilinguals self-reported being exposed to Spanish and English either simultaneously from birth or sequentially but at a very young age, mainly receiving exposure to English through daycare and/or school. Importantly, they also reported to engage in habitual codeswitching practices.

In his analysis, Cruz found that feminine analogical gender was restricted to a small set of English inanimate nouns with Spanish feminine translation equivalents, whereas bilinguals overwhelmingly adopted a masculine default assignment strategy with the majority of inanimate nouns. Human-denoting nouns were an exception to the masculine default strategy observed with inanimate nouns. With this set of nouns, bilinguals assigned grammatical gender based on the presupposed sex of a noun's referent, so that male nouns are masculine and female nouns are feminine in a categorical fashion; see also DuBord (2004) for similar findings from another sample of Spanish–English bilinguals from Southern Arizona.

The present experimental study is a follow-up to the gender assignment strategies observed for the bilinguals in the CESA Corpus. This experimental design aims to delimit the extent to which the Spanish gender system (or analogical gender) mediates gender assignment in experimentally elicited responses to Spanish–English codeswitched speech by a bilingual sample from the same community as the informants of the CESA Corpus. This experimental design is important because (i) feminine gender is much less frequent than masculine gender with non-human nouns and (ii) human nouns are infrequent in the CESA Corpus. But most importantly, this study may shed new light on how representative experimental research is of naturally-occurring codeswitched speech.

Experimental studies on gender assignment in bilingual speech

Codeswitching is by definition a pragmatically and socially driven language phenomenon, and experimental designs that seek to minimize variables of no interest compromise its spontaneous nature. Yet, scholars agree that experimental research can contribute to a better understanding of this linguistic behavior unique to bilinguals (Beatty-Martínez et al., 2018; Gullberg et al., 2009; Munarriz-Ibarrola et al., 2021; Valdés Kroff et al., 2017; Valdés Kroff & Fernández-Duque, 2017). Given the asymmetry of grammatical gender in Spanish and English, a logical question from an experimental perspective is whether Spanish–English bilinguals who engage in codeswitching practices apply analogical gender as defined in (2b) when asked to assign gender to English nouns occurring in different codeswitching environments. Although the empirical evidence indicates that Spanish–English bilinguals gravitate toward a masculine default assignment strategy, feminine analogical gender also plays a role in experimentally elicited responses to codeswitched speech.

For instance, in a codeswitching picture naming task where the labels of the target pictures were equally divided for masculine and feminine Spanish labels, Fairchild and Van Hell (2017) found that Spanish–English bilinguals produced the masculine determiner 'el' with English nouns whose Spanish translation equivalents are feminine only 7.2% of time. This finding suggests that bilinguals applied feminine analogical gender with most English nouns with feminine Spanish translations. On the other hand, Denbaum and de Prada Pérez (2020) found that Spanish–English bilinguals were more likely to adopt a masculine default strategy with most English nouns occurring in codeswitched speech, rather than applying analogical gender, in a story telling task. Similarly, Valenzuela, Faure, Ramírez-Trujillo, Barski, Pangtay and Diez (2012) did not find support for analogical gender in an acceptability judgement task targeting Spanish det–English noun switches. Importantly, these last two studies also examined the potential influence of the /o/-/a/ gender cues of the Spanish translation equivalents in modulating gender assignment in codeswitched speech. The results, however, indicated that such phonemic cues did not modulate the assignment mechanism since masculine was predominantly the default gender.

Of relevance to the present study, Valenzuela et al. (2012) also examined gender assignment in Spanish copula constructions where a Spanish adjective controlled for gender agreement of an English noun (e.g., *Está crud-o/a* '[the meat] is raw-M/F'). They reported that gender congruency based on the gender of the Spanish translation equivalent was relatively low for feminine gender in Spanish det–English noun switches (56%) compared to Spanish copula constructions (71%), whereas masculine gender was at ceiling in both syntactic environments. This particular finding opens the possibility that feminine gender may be more prevalent in switched copula constructions than switched determiner phrases – a question I explore in the present study.

Language processing studies have also revealed important findings in terms of gender assignment in Spanish–English codeswitched speech. For instance, Beatty-Martínez and Dussias (2017) emphasized that feminine gender is restricted to English

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nouns with Spanish feminine translations (e.g., *la spoon* 'the.F', congruent condition with feminine translation equivalent) in spontaneously elicited codeswitched speech, whereas masculine gender does not extend to feminine Spanish translations (e.g., *la fork* 'the.F', incongruent condition with masculine transition equivalent). Using event-related potentials (ERPs), they found that Spanish–English bilinguals who habitually engage in codeswitching practices exhibited greater difficulty when processing incongruent switches (e.g., *la fork* 'the.F') compared to the congruent condition, suggesting that these bilinguals are rarely exposed to the incongruent condition. Taking the same gender asymmetry studied in Beatty-Martínez and Dussias (2017), Valdés Kroff et al. (2017) employed the visual world paradigm technique (eye-tracking data) to codeswitching and showed that only the feminine article 'la', but not its masculine counterpart 'el', facilitated the upcoming of English nouns with Spanish feminine translations (e.g., *la house* 'the.F'). Together, these language processing studies confirmed that Spanish–English bilinguals attended to both masculine and feminine analogical genders when processing Spanish–English codeswitched speech on real time.

While current experimental studies indicate that masculine gender is the prevailing gender in Spanish–English codeswitched speech similar to spontaneously elicited data, current studies have not been able to validate their experimental data with spontaneously elicited data from the same bilingual community, with the exception of Beatty-Martínez and Dussias (2017). The present study is a step toward this goal.

The present study

The present study aims to delimit the extent to which analogical gender is empirically supported in experimentally elicited responses to codeswitched speech from a well-defined codeswitching community in Southern Arizona, U.S. If analogical gender is at work, I further explore the potential influence of other-language phonemic cues in modulating the assignment mechanism. I also study the role of semantic gender in determining the grammatical gender of human-denoting nouns. These linguistic factors are examined in two codeswitching environments: Spanish det–English noun switches (e.g., *el/la key* 'the.M/F') and English–Spanish switched copula constructions (e.g., *The key está rot-o/a* 'is broken-M/F'). While codeswitching within the determiner phrase is well-attested in spontaneous codeswitched speech, English–Spanish copula constructions are admittedly less common (Pfaff, 1979; Poplack, 1980; Woolford, 1983). Yet, the existing experimental evidence indicates that Spanish–English bilinguals exhibited higher gender congruency for feminine analogical gender in Spanish copula constructions compared to switched determiner phrases (Valenzuela et al., 2012). Unlike Valenzuela et al.'s study where Spanish copula constructions were used, the present study includes switched copula constructions consisting of an English determiner and a noun followed by one of the Spanish copula verbs *ser* or *estar*, both meaning 'to be'.

Methods

Participants

Thirty-four Spanish–English bilingual speakers (27 females) between the ages of 18 and 29 ($M = 20.65$; $SD = 2.71$) participated in this study. They represented early bilinguals immersed in a bilingual experience from birth or as early sequential bilinguals – that is, they were first exposed to Spanish in the family at an age that ranged from 0 to 5 years ($M = .34$, $SD = 1.08$) and to English at an age that ranged from 0 to 12 years ($M = 3.63$, $SD = 2.56$). All participants were recruited in Tucson, Arizona, U.S. This particular geographical region of the U.S. was chosen because Spanish–English bilinguals who live and work in Southern Arizona, including Tucson, are well-known to engage in habitual codeswitching practices (Besset, 2017; Casillas, 2013; Cruz, 2016, 2018; DuBord, 2004; Kern, 2019).

All participants completed a modified version of the Language and Social Background Questionnaire (LSBQ) originally developed by Anderson, Mak, Keyvani Chahi and Bialystok (2018). The LSBQ elicited participants' demographics, language background information, and self-ratings of proficiency in both Spanish and English. All participants gave informed consent approved by Georgetown University Institutional Review Board and were paid $15 for their participation. Twenty-nine (or 85.3%) of the 34 sample were born and raised in Southern Arizona, including Tucson; four participants were born and raised in California but were working or studying in Arizona at the time of the study, and only one participant was born in Oklahoma but raised in Arizona. The majority of the participants (31 of the 34 total sample, or 91.17%) were enrolled in an undergraduate degree program at a large public institution in Southern Arizona; two participants (or 5.89%) were enrolled at a community college in the same region, and one participant (or 2.94%) had completed only high school at the time of the study.

A self-report measure where 1 indicates not proficient at all and 7 indicates highly proficient was used to assess participants' linguistic proficiency in reading, writing, speaking, and listening in both Spanish and English. Proficiency in Spanish was also assessed through the Spanish Elicited Imitation Task (EIT) in Bowden (2016), a slightly modified version of a shortcut measure of language proficiency developed by Ortega, Iwashita, Norris, and Rabie (2002) and widely used for research purposes in many languages including Spanish (Park, Solon, Henderson & Dehghan-Chaleshtori, 2020) and English (Wu, Tio & Ortega, 2022). The EIT scores are taken as independent evidence for proficiency that complements the self-report data collected in the language questionnaire. Participants were also asked whether they codeswitch and what percentage of the time they codeswitch on a weekly basis with parents, siblings, friends, classmates, and social media. Importantly, self-reported measures of codeswitching are a reliable tool to determine a Spanish–English bilingual's production of English in otherwise Spanish discourse (Cox, LaBoda & Mendes, 2020; Valdés Kroff & Fernández-Duque, 2017). The full set of participants' bilingual experience and language proficiency is reported in Table 1.

All participants reported that they learned Spanish at home but were fully schooled in English. More specifically, participants' mean onset age of exposure to Spanish was .34 years ($SD = 1.08$, min = 0 and max = 5 years), whereas mean age of first exposure to English was 3.62 years ($SD = 2.56$, min = 0 and max = 12 years). In other words, the bilingual profile of this bilingual sample indicates that some of the participants were immersed in a bilingual experience from birth (simultaneous bilinguals), while others are early sequential bilinguals who experienced a short period of monolingual learning and were subsequently exposed to English during the first years of life through daycare and/or preschool (e.g., Armon-Lotem & Meir, 2019; Ortega, 2020). As for language

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Table 1. Characteristics of Spanish–English early bilinguals

		M (*SD*)	min–max
Age at testing (years)		20.65 (2.71)	18–29
Onset age of exposure to Spanish		0.34 (1.08)	0–5
Onset age of exposure to English		3.73 (2.52)	0–12
Self-rated Spanish proficiency			
	reading	6.11 (0.91)	4–7
	writing	5.50 (1.23)	1–7
	speaking	6.20 (0.94)	4–7
	listening	6.79 (0.47)	5–7
Overall self-rated proficiency in Spanish		6.15 (0.52)	
Self-rated English proficiency			
	reading	6.70 (0.62)	4–7
	writing	6.47 (0.82)	4–7
	speaking	6.58 (0.74)	4–7
	listening	6.88 (0.32)	6–7
Overall self-rated proficiency in English		6.66 (0.17)	
Spanish EIT Scores		113.23 (8.75)	82–120
Codeswitching practices per week			
	with friends	56.76 (29.00)	0–100
	with siblings	48.52 (31.24)	0–100
	with classmates	35.30 (28.52)	0–100
	in social media	35.90 (31.34)	0–100

Note. Self-ratings are from 1 = not proficient at all to 7 = highly proficient. Spanish EIT maximum total score is 120. Codeswitching is expressed in percent per week.

use, participants reported that they speak Spanish and English with their siblings at home but only Spanish with their parents. With the exception of a few participants (or 5.89% for the 34 sample), 32 (or 94.11%) participants reported that they codeswitch on a daily basis, especially with friends and social media.

In terms of language proficiency, participants assigned themselves high proficiency for both languages in the self-reporting measure. Based on these scores, a one-factor multivariate analysis of variance (MANOVA) was conducted to compare self-reported scores for proficiency in English vs. Spanish. The four language skills in the self-reporting measure served as the dependent variables in the analysis, and language (Spanish vs. English) comprised the independent variable. The results from the MANOVA were statistically significant according to Wilk's Λ (0.79), $F(4, 63) = 3.950$, $p = .006$. Separate univariate tests on the outcome variables revealed statistically significantly differences on reading $F(1, 66) = 9.56$, $p = .003$ and writing $F(1, 66) = 14.48$, $p = .000$, but non-significant differences on speaking $F(1, 66) = 3.43$, $p = .068$ or listening $F(1, 66) = 0.788$, $p = .378$. In other words, participants scored themselves higher in reading and writing in English compared to Spanish, but they are balanced bilinguals when it comes to oral communication. These results are not surprising since participants indicated that they were fully schooled in English, whereas Spanish is often limited to the home environment. The EIT global proficiency measure confirmed participants' very high proficiency in Spanish with a 113.23 mean accuracy rate, very 'high' in the sense that the highest mean reported in Bowden (2016) for her 'very advanced' group was a 109.3 mean accuracy.

In summary, participants are highly proficient Spanish–English bilinguals who frequently engage in codeswitching practices. Since they live and work in a well-defined codeswitching community in Southern Arizona, it is also fair to suggest that they are exposed to codeswitched speech on a daily basis. Importantly, the bilingual profiles of these participants mirror the language profiles of the bilinguals studied in Cruz (2021).

Materials

The critical stimuli included 80 English nouns equally divided into human-denoting nouns (e.g., boy, girl, nephew, etc.) and inanimate nouns (e.g., spoon, door, key, etc.). 68 nouns from another set were used as distractors, including 12 human-denoting nouns with context-dependent gender which could occur more than once in the distractor item condition (e.g., coach, friend, witness, etc.) and 56 English inanimate nouns with masculine and feminine Spanish translations for a total of 68 nouns (see Appendix S1 in Supplementary Materials for list of target and distractor items). All target nouns (n = 80) were equally divided for grammatical gender based on their Spanish translation equivalents (analogical gender). Target nouns were further subdivided into three conditions representing the three linguistic variables that concern us in the present study.

Variable 1 is 'semantic gender,' represented in 40 human nouns equally divided into male and female referents whose Spanish translations are masculine and feminine, respectively. These human nouns have lexico-semantic gender (e.g., nephew vs. niece), as opposed to context-dependent gender (e.g., coach or doctor). Variable 2 is 'analogical gender,' represented in 40 English inanimate nouns equally divided into masculine and feminine analogical gender based on the gender of their Spanish translation equivalents (e.g., English *key* is feminine in Spanish, *la llave*). Variable 3 represents 'other-language phonemic cues.' For this variable, the 80 target nouns were equally divided into four conditions based on the phonemic make up of their Spanish translations: highly reliable phonemic cue for masculine gender (e.g., *-o* in *vestido* 'dress,' n = 20), no phonemic cue for masculine gender (e.g., -Ø in *lápiz* 'pencil,' n = 20), highly reliable phonemic cue for feminine gender (e.g., *-a* in *puerta* 'door,' *n* = 20), and no phonemic cue for feminine gender (e.g., -Ø in *sal* 'salt,' *n* = 20).

The majority of inanimate nouns used in the present study are frequent nouns found in the CESA Corpus analyzed in Cruz (2021). However, most of the human-denoting nouns may be less representative of occurring in codeswitched speech since such nouns are relatively infrequent in the CESA Corpus. These 80 target nouns occurred in two syntactic environments which are described next.

Procedure

Although codeswitching is a socially and pragmatically driven linguistic behavior (Bullock & Toribio, 2009; Torres Cacoullos & Travis, 2018; Zentella, 1997), every effort was made in order to foster ecological validity in this experimental design. Two forced-

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choice elicitation tasks were developed to examine the deployment of linguistic information when determining the gender of an English noun occurring in codeswitched speech. Task 1 elicited evidence for gender assignment in Spanish det–English noun switches. For Task 1, a total of 80 Spanish–English codeswitched sentences embedding a target noun along with a Spanish verb and prepositions was created by the researcher (e.g., *Ya estamos en __ plane* 'We are already in __ plane'). The target noun was the only switch site in these carrier sentences. Although the carrier sentences were not exactly the same utterances observed in the CESA Corpus, they were constructed after an analysis of English nouns inserted in otherwise Spanish-initiated conversations in this corpus (see Cruz, 2021 for relevant data), and their likelihood as a possible site for codeswitching was confirmed by two bilingual speakers who engage in codeswitching. All carrier sentences consisted of no more than 8 words whereby the target noun always appeared either after the second or the third word in the sentence. The Spanish masculine article *el* and the feminine article *la* were used as the possible syntactic elements that could complete the carrier sentences in a binary response-choice.

Another set of 75 Spanish–English switched sentences (e.g., *No sabe __ password* 'S/he doesn't know __ password') served as the carrier sentences for the distractor items in Task 1. The Spanish possessive adjectives *su* meaning 'his/her/its/their' and *mi* meaning 'my' were the possible syntactic elements that could complete the distractor carrier sentences in a binary response-choice. Importantly, only the Spanish articles *el* and *la*, but not *su* and *mi*, are marked for gender in Spanish. A participant then saw a total of 155 stimuli sentences in Task 1.

A follow-up task to Task 1 was also developed to further examine gender assignment in English–Spanish switched copula constructions (e.g., *The key está rot-o/a* 'is broken-M/F') with the same target nouns used in Task 1. This particular syntactic juncture is important to include in the present study because Valenzuela et al. (2012) found that Spanish–English bilinguals exhibited higher gender congruency for feminine analogical gender in Spanish copula constructions compared to switched determiner phrases in a forced-choice elicitation task. Therefore, Task 2 aims to provide further empirical evidence of gender assignment in different syntactic environments by the same sample of bilinguals who participated in Task 1.

For the purpose of Task 2, a total of 80 carrier phrases was created by the researcher, and the phrases' likelihood as possible sites for codeswitching was confirmed by the two bilinguals who rated the sentences of Task 1. The carrier phrases consisted of an English determiner and a target noun followed by one of the Spanish copula verbs *ser* or *estar*, both meaning 'to be'. The carrier phrases triggered an attributive adjective as the potential syntactic element that could complete the carrier phrase (e.g., *The key está* ___ 'The key is ___'). The binary response-choice consisted of a masculine (e.g., an adjective ending in *-o*, *roto* 'broken-M') and a feminine Spanish adjective (e.g., the same adjective ending in *-a*, *rota* 'broken-F'). A total of 45 Spanish attributive adjectives morphologically marked for gender was used as the response-choice for Task 2.

Another set of 75 carrier phrases was also created for the same distractor items used in Task 1. The binary response-choice for the distractor items for Task 2 consisted of a Spanish adjective unmarked for gender and its English equivalent (e.g., Spanish *triste* and English *sad*). All target adjectives used in Task 2 are frequent Spanish adjectives extracted from the EsPal dataset (Duchon, Perea, Sebastián-Gallés, Martí & Carreiras, 2013; retrieved from https://www.bcbl.eu/databases/espal/). Importantly, grammatical gender is the only difference between the binary response-choice in Task 2 since the target adjective marked for gender did not differ in meaning. In Task 2, a participant then saw a total of 155 carrier phrases embedding the same target nouns used in Task 1 (see Appendix S2 in Supplementary Materials for list of carrier sentences).

Participants completed the experiment individually in a quiet room at an educational institution. They completed a language questionnaire on paper and were subsequently guided to read the instructions of the experiment on a computer screen. The instructions were presented in English and indicated that participants would see a list of short sentences missing information and that their task was to complete the sentences with the information appearing underneath in a way that sounded as natural as possible to them. The carrier sentences (or phrases) embedding the target noun were presented on a 13.75″ × 9.48″ computer screen using PsychoPy3 (Peirce, Gray, Simpson, MacAskill, Höchenberger, Sogo, Kastman & Lindeløv, 2019). The carrier sentence and the binary response-choice appeared simultaneously for both the target and distractor items and in both tasks. The 80 carrier sentences and their respective response-choices were pseudo-randomized among the 75 distractor sentences (phrases) in both tasks; the binary response-choice was also randomized so that *el* and *la* (or a Spanish adjective marked for gender in Task 2) could appear either on the left or the right of the screen. All stimuli sentences were presented in an untimed manner; this was necessary to ensure that participants were selecting the response-choice that sounded most natural to them – that is, their preferred codeswitching practice. Participants were instructed to press a key on a computer keyboard to select their responses accordingly.

Participants completed a trial of eight practice items. The researcher stood in the room while participants completed the practice trial to make sure that participants had no questions. Once the practice trail was over, the PsychoPy code guided the participants to the target trials for Task 1. When Task 1 was completed, participants were thanked for completing the task and were further invited to continue to Task 2; they could take a break between tasks if desired. When the experiment was done, participants completed the EIT proficiency assessment reported in Table 1. The whole session took about 50 minutes.

Analyses

The responses elicited from Task 1 and Task 2 were analyzed using mixed-effects logistic regression models with a logistic linking function appropriate for categorical data (Jaeger, 2008; Sommet & Morselli, 2017) and with random intercepts for participants and items (Baayen, Davidson & Bates, 2008). Regression analyses were performed using the lme4 package (Bates, Maechler, Bolker & Walker, 2015) in the statistical software application R (R Core Team, 2018). Mixed-effects logistic regression analyses are ideal for the categorical variable that concerns us here because they perform analyses on the participants' individual responses rather than mean responses per condition (Jaeger, 2008). The model was fitted to the data obtained from Task 1 and Task 2 with response (congruent = 1, incongruent = 0) as the categorical dependent variable and semantic gender, analogical gender, and other-language phonemic cues as fixed factors. Treatment coding was used for the fixed factors such that

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positive coefficients would reflect an increase in likelihood of congruent responses (Baayen et al., 2008). The alpha level was set at $p < .001$, for a conservative interpretation of statistical trustworthiness (e.g., a less than one is a thousand chance of being wrong in rejecting the null hypothesis).

Results

Results for Task 1

Task 1 examined the linguistic factors that may promote the likelihood of gender assignment (masculine or feminine) to English nouns occurring in Spanish det–English noun switches (e.g., *Ya estamos en ___ plane* 'We are already in ___ plane'). For sake of clarity, I describe the results in terms of GENDER CONGRUENCY, which refers to the proportion of Spanish determiners whose gender is consistent (gender congruent or gender incongruent) with the Spanish translation equivalent of the English target noun. Table 2 reports the proportions of gender-congruent selections per condition for Task 1.

The descriptive statistics in Table 2 show that gender-congruent selections were at ceiling with human-denoting nouns whereby nouns with male referents are masculine (Conditions 1 & 2 combined: $M = .92$, $SD = .25$) and those with female referents are feminine (Conditions 5 & 6 combined: $M = .92$, $SD = .26$), and this is true across the board and regardless of the other-language phonemic cues variable. As for inanimate nouns, proportions of gender-congruent selections were higher for masculine gender (Conditions 3 & 4 combined: $M = .89$, $SD = .29$) compared to feminine gender (Conditions 7 & 8 combined: $M = .62$, $SD = .47$). Descriptively, gender-congruent selections were higher for feminine gender with English nouns whose Spanish translations lack gender cues (e.g., honey, *miel*; $M = .70$, $SD = .45$) compared to translation equivalents that exhibit gender cues (e.g., border, *frontera*; $M = .55$, $SD = .49$).

To test the sensitivity to gender congruency for Task 1, the descriptive statistics in Table 2 were further analyzed using mixed-effects logistic regression models. The dependent variable for Task 1 was response-choice to gender selection (masculine or feminine). First, I ran a model containing only by-participant and by-item random intercepts. Since this model yielded changes of its intercept values when each predictor was added individually, I then fitted another model which included analogical gender with four levels (female + feminine, male + masculine, inanimate + masculine, inanimate + feminine) and the other-language phonemic cues variable for all items with two levels (strong, no cue) as fixed factors as well as an interaction between analogical gender and other-language phonemic cues. The data were treatment-coded with 'inanimate + masculine' and 'strong cue' as the reference levels for the model. The results of the best fitting model are reported in Table 3. As a reminder, positive estimates (β) indicate a greater likelihood of the outcome 1 (congruent response) and negative estimates a greater likelihood of 0 (incongruent response).

Table 3 shows that there was a main effect for analogical gender with inanimate nouns. More specifically, the negative estimate for feminine analogical gender ($\beta = -2.16$; $SE = 0.44$; $z = -4.84$, $p < .001$) indicates that participants are more likely to assign masculine gender over feminine gender to English inanimate nouns. Since gender assignment was almost categorical with human-denoting nouns (see Table 2), semantic gender was not a significant predictor when compared to the reference level. Contrary to our predictions, the other-language phonemic cues variable was not a significant predictor for gender assignment in Task 1 ($\beta = .66$; $SE = 0.48$; $z = 1.36$, $p = .173$), and no interaction between semantic or analogical gender and the other-language phonemic cues variable was observed. Next, I turn to the results for Task 2.

Results for Task 2

Task 2 tested gender assignment in English–Spanish switched copula constructions (e.g., *The key está rot-o/a* 'is broken-M/F').

Table 2. Proportions of gender-congruent selections per condition for Task 1

Male nouns + masculine +/− phonemic cue		Target nouns	*M*	*SD*
1.	male, strong cue	nephew = sobrino	0.94	0.23
2.	male, no cue for gender	king = rey	0.91	0.28
3.	masculine, strong cue	roof = techo	0.87	0.33
4.	masculine, no cue for gender	pencil = lápiz	0.92	0.26
Female nouns + feminine +/− phonemic cue				
5.	female, strong cue	niece = sobrina	0.94	0.23
6.	female, no cue for gender	actress = actriz	0.90	0.28
7.	feminine, strong cue	movie = película	0.55	0.49
8.	feminine, no cue for gender	salt = sal	0.70	0.45

Note. Total possible score per condition is 10, one point per noun.

Table 3. Summary of mixed logistic regression model for variables predicting participants' likelihood of gender-congruent selections for Task 1

Predictor	*β*	*SE*	*z*	*p*
(Intercept)	**2.41**	**0.35**	**6.81**	**0.001***
Semantic gender (female + f)	0.75	0.49	1.53	0.124
Semantic gender (male + m)	0.76	0.49	1.55	0.119
Analogical gender (f)	**−2.16**	**0.44**	**−4.84**	**0.001***
Phonemic cue (no)	0.66	0.48	1.36	0.173
Semantic gender (female + f) × Phonemic cue (no)	−1.04	0.70	−1.49	0.136
Semantic gender (male + m) × Phonemic cue (no)	−1.05	0.69	−1.50	0.131
Analogical gender (f) × Phonemic cue (no)	0.11	0.64	0.18	0.857
Random Effects	Variance	*SD*		
Intercept | Subject	0.430	0.656		
Intercept | Sentence	0.728	0.853		

Note. f = feminine, m = masculine; the parameter estimate (β), standard error of the parameter estimate (SE), z-value and p-value for predictor variables and their interaction.
Note. *$p < .001$.

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Table 4. Proportions of gender-congruent selections per condition for Task 2

Male nouns + masculine +/− phonemic cue		Target nouns	*M*	*SD*
1.	male, strong cue	nephew = sobrino	0.96	0.19
2.	male, no cue for gender	king = rey	0.93	0.25
3.	masculine, strong cue	roof = techo	0.74	0.43
4.	masculine, no cue for gender	pencil = lápiz	0.82	0.37
Female nouns + feminine +/− phonemic cue				
5.	female, strong cue	niece = sobrina	0.96	0.17
6.	female, no cue for gender	actress = actriz	0.91	0.28
7.	feminine, strong cue	movie = película	0.64	0.47
8.	feminine, no cue for gender	salt = sal	0.60	0.48

Note. Total possible score per condition is 10, one point per noun.

For Task 2, GENDER CONGRUENCY refers to the proportions of Spanish adjectives whose gender is consistent with the Spanish translation equivalent of the English target noun. Table 4 reports the proportions of gender-congruent selections per condition for Task 2.

Similar to Task 1, gender-congruent selection with human-denoting nouns was almost categorical in Task 2, regardless of other-language phonemic cues. Unlike Task 1 where participants exhibited higher gender-congruent selections with masculine gender, proportions of gender-congruent selections with inanimate nouns were relatively low for both masculine and feminine gender in Task 2, although masculine gender is slightly higher (Conditions 3 & 4 combined: $M = .78$, $SD = .40$) than feminine gender (Conditions 7 & 8 combined: $M = .62$, $SD = .48$).

The descriptive statistics in Table 4 were further submitted to a mixed-effects logistic regression analysis. The fixed factors for the analysis in Task 2 were operationalized as in Task 1 – that is, the data were treatment-coded with 'inanimate + masculine' as the reference level. Table 5 reports the results of the best-fitting model.

Similar to Task 1, the best fitting model for Task 2 indicates that semantic gender was the only significant predictor for gender congruency. More specifically, nouns with male referents are almost categorically masculine (β=2.40; $SE = .47$; $z = 5.03$, $p < .001$) and those with female referents are feminine (β=2.50; $SE = .48$; $z = 5.16$, $p < .001$). Although the descriptive statistics in Table 4 indicate a tendency for a masculine default strategy in Task 2, the analysis did not exert a significant value for masculine gender compared to feminine gender with inanimate nouns occurring in English–Spanish switched copula constructions, in contrast to Task 1. Similar to Task 1, other-language phonemic cues did not exert any main effects, and no interaction between semantic or analogical gender and the other-language phonemic cues variable was observed.

In summary, gender assignment with human-denoting nouns was almost categorical in both tasks, and regardless of the other-language phonemic cues variable. On the contrary, proportions of gender-congruent selections for feminine gender were relatively low with inanimate nouns in both tasks, whereas masculine gender exerted higher gender-congruent selections in these tasks. The logistic regression model picked up on the observed asymmetry of higher gender-congruent selections for feminine gender when it comes to female referents but very low proportions of gender-congruent selections for feminine gender when it comes to inanimate nouns. In the next section, I discuss how the current findings corroborate or deviate from the broader consensus on gender assignment in Spanish–English codeswitched speech and the implications of the current findings for a better understanding of the codeswitching practices of Spanish–English bilinguals who live and work in a well-defined codeswitching community in Southern Arizona, U.S.

Table 5. Summary of mixed-logistic regression model for variables predicting participants' likelihood of gender-congruent selections for Task 2

Predictors	β	*SE*	*z*	*p*
(Intercept)	1.27	0.30	4.23	0.001 *
Semantic gender (male + m)	**2.40**	**0.47**	**5.03**	**0.001***
Semantic gender (female + f)	**2.50**	**0.48**	**5.16**	**0.001***
Analogical gender (f)	−0.59	0.40	−1.51	0.130
Phonemic cue (no)	0.62	0.40	1.53	0.125
Semantic gender (male + m) × Phonemic cue (no)	−1.26	0.65	−1.93	0.053
Semantic gender (female) × Phonemic cue (no)	−1.54	0.65	−2.36	0.018
Analogical gender (f) × Phonemic cue (no)	−0.80	0.55	−1.43	0.152
Random Effects	Variance	*SD*		
Intercept | Subject	0.410	0.640		
Intercept | Sentence	0.595	0.771		

Note. f = feminine, m = masculine; the parameter estimate (β), standard error of the parameter estimate (SE), z-value and p-value for predictor variables and their interaction.
Note. *$p < .001$.

General discussion

The point of departure in the present study was the observation that gender assignment is a ubiquitous linguistic feature in the bilingual speech of a well-defined Spanish–English codeswitching community in Southern Arizona, U.S., and that experimental evidence from the same bilingual community can be a valuable source of new insights into the distributional codeswitching patterns from this particular community. Drawing on the spontaneously elicited data documented in the CESA Corpus (Carvalho, 2012), the present experimental study examined the potential influence of semantic gender (a.k.a. biological gender), analogical gender, and other-language phonemic cues in modulating gender assignment in two syntactic codeswitching environments: Spanish det–English noun switches (Task 1) and English–Spanish switched copula constructions (Task 2). Importantly, only Spanish, but not English, exhibits grammatical gender, and so the results of the present study can shed new light on the intricate question of whether the gender of the translation equivalent (analogical gender) mediates the assignment mechanism applied in codeswitched speech or whether this mechanism operates independently of the other-language gender system.

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Human-denoting nouns can be classified according to properties of their real-world referents, and I reasoned that bilinguals would evoke the presupposed sex of a noun's referent when classifying such nouns into the masculine or feminine gender categories in codeswitched speech because semantic gender and grammatical gender coincide in Spanish (Harris, 1991). I also emphasized that this set of nouns is particularly important to examine in experimental settings because such nouns are relatively infrequent in spontaneously elicited codeswitched speech across Spanish–English bilingual communities (Cruz, 2021), and no experimental study has tested this set of nouns. The results demonstrated that bilinguals classified male-denoting nouns to masculine gender and female-denoting nouns to feminine gender in a categorical fashion, and in both syntactic environments tested. In other words, bilinguals evoked the presupposed sex of a noun's referent to determine its grammatical gender in codeswitched speech. With the exception of the Bangor Miami Corpus (Deuchar et al., 2014) where a masculine default strategy overrides semantic gender (Valdés Kroff, 2016), the results of the present study concur with the majority of corpora studies which have reported that semantic gender is a strong predictor for gender assignment in spontaneously elicited codeswitched speech across Spanish–English bilingual communities in the U.S. (Clegg & Waltermire, 2009; Cruz, 2021; DuBord, 2004; Otheguy & Lapidus, 2003; Poplack et al., 1982; Trawick & Bero, 2021). From a methodological perspective, the results suggest that human nouns should not be conflated with inanimate nouns in laboratory-based studies.

English inanimate nouns lack gender information altogether, and both corpora and experimental studies indicate that Spanish–English bilinguals gravitate toward a masculine default assignment strategy with such a set of nouns. Feminine analogical gender, on the other hand, is restricted to some English nouns with Spanish feminine translation equivalents (Cruz, 2021). The present study followed a balanced two-gender system equivalence with Spanish, giving participants the same chances to respond to masculine (with 20 items) and feminine gender (with 20 items) with inanimate nouns in the syntactic environments tested. However, the logistic regression model revealed that participants were significantly more likely to assign masculine gender compared to feminine gender to inanimate nouns occurring in Spanish det–English noun switches (Task 1). In the case of English–Spanish copula constructions (Task 2), no statistical significance for masculine gender was observed. That is, proportions of gender-congruent selections were relatively low for both masculine (78%) and feminine gender (62%) in Task 2, although masculine is still descriptively higher than feminine gender.

Assuming that analogical gender is at work in codeswitched speech, I took a step further and asked whether phonemic cues that strongly correlate with gender assignment in Spanish (e.g., the /o/-/a/ contrast) modulate the assignment mechanism in experimentally elicited responses to codeswitched speech. All target nouns were equally divided into 'strong cues' and 'no cues' relevant to masculine and feminine analogical gender on the basis of the phonemic make up of their Spanish translation equivalents. The statistical analysis revealed no interaction between analogical gender and the /o/-/a/ gender cues of the Spanish translation equivalents. Valenzuela et al. (2012) and Denbaum and de Prada Pérez (2020) also reported negative results on the potential influence of other-language phonemic cues – namely, the /o/-/a/ contrast – in modulating gender assignment in Spanish–English codeswitched speech. In short, the results indicate that the prevalence for a masculine default assignment strategy trumps the potential retrieval of analogical gender in experimentally elicited responses to codeswitched speech, even when the target nouns were equally divided for analogical gender based on the Spanish translation equivalents of the target English nouns.

The gender asymmetry observed in the present study – where feminine gender elicited relatively low proportions of gender-congruent selections and masculine gender exerted a default status in Spanish det–English noun switches – merits further exploration in terms of the codeswitching behavior of our bilingual sample. At first glance, the prevailing preference for masculine gender in Spanish det–English noun switches (Task 1) seems to reflect the default status of masculine gender in Spanish, or "preferences that are internal to Spanish" in Aaron's (2015) terms (p. 470). However, and despite the fact that English lacks grammatical gender, the distributional patterns of gender assignment in other bilingual communities challenge this intuition. In other words, if the preference for masculine gender in Spanish–English codeswitched speech is mediated by a default assignment mechanism internal to the morphosyntax of gender in Spanish (see Harris, 1991 for such mechanism), it is logical to expect masculine gender to be the preferred gender in codeswitching environments where only Spanish exhibits grammatical gender. This prediction, however, does not hold up across bilingual communities where Spanish is involved in codeswitching.

For instance, Parafita Couto et al. (2015) reported that feminine gender, and not masculine gender, is the preferred gender in Spanish–Basque spontaneous codeswitched speech – a language pair where only Spanish exhibits grammatical gender. Although there is some evidence indicating that masculine is the preferred gender in Purepecha–Spanish codeswitching where a Spanish adjective controls gender agreement (Bellamy, Parafita Couto & Stadthagen-Gonzalez, 2018), the fact that feminine gender is the preferred gender in Spanish det–Basque noun switches indicates that bilingual communities adopt different assignment strategies.

In particular, in this paper I suggest that the prevailing preference for masculine gender in Spanish det–English noun switches (e.g., *el wand* 'the.M') is better attributed to the codeswitching norms of the well-defined codeswitching community of Southern Arizona where our participants live and work. In this Spanish–English bilingual community, masculine gender is overwhelmingly preferred with English nouns in spontaneously elicited codeswitched speech regardless of the gender of their Spanish translation equivalents (Cruz, 2021; DuBord, 2004). This interpretation is congenial with the burgeoning evidence indicating that codeswitching patterns across bilingual communities conform to community-based codeswitching norms (Beatty-Martínez & Dussias, 2017; Bellamy & Parafita Couto, 2022; Królikowska, Bierings, Beatty-Martínez, Navarro-Torres, Dussias & Parafita Couto, 2019, cited in Beatty-Martínez & Dussias, 2019; Ramírez Urbaneja, 2020; Torres Cacoullos & Travis, 2018; Valdés Kroff, 2016). In other words, and granted that codeswitching at the determiner phrase is a suitable and preferred syntactic juncture for Spanish–English bilinguals to codeswitch in spontaneous speech, the preference for masculine gender at this syntactic juncture reflects community-driven codeswitching patterns rather than having been triggered by some internal mechanism of the morphosyntax of Spanish. This explanation points to the observation that feminine gender applies only when bilingual speakers reflect on the translation equivalent of an English noun occurring in codeswitched speech. The question

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of WHEN, or in what context, bilinguals are more likely to reflect on the translation equivalent of an English noun occurring in codeswitched speech merits a careful investigation in laboratory-based research. I leave this question for future research.

Finally, this study also asked what similarities or differences might ensue from examining gender assignment in Spanish det–English noun switches (Task 1) versus English–Spanish copula constructions (Task 2). While gender assignment with human nouns was almost categorical in both tasks, proportions of gender-congruent selections for masculine gender reached statistical significance only in Task 1, but not in Task 2, with nouns that lack gender information altogether. The rationale for including switched copula constructions in the present study was in response to Valenzuela et al. (2012) who reported higher proportions of feminine gender with Spanish copula constructions (71%) compared to Spanish det–English noun switches (56%). In the present study, proportions of feminine gender were equally low with inanimate nouns in both tasks (62%). Higher proportions of feminine gender in Valenzuela et al.'s study could be due to the fact that the entire copula construction was in Spanish (e.g., *Está crud**o**/**a*** 'It's raw-M/F'), whereas the target English noun initiated the switched construction in the present study (e.g., *The meat está crud**o**/**a*** 'is raw-M/F'). Furthermore, it is important to note that the Spanish–English bilinguals studied in Valenzuela et al.'s study lived and worked in Canada, whereas our participants lived and worked in the U.S. at the time of the present study.

How then can we interpret the discrepancy between Task 1 and Task 2 in terms of masculine gender in the present study? First, I should emphasize that codeswitching at copula constructions is rarely attested in Spanish–English spontaneous codeswitched speech (Pfaff, 1979; Poplack, 1980; Woolford, 1983). Therefore, a plausible explanation for the observed discrepancy is that participants experienced more difficulty with Task 2 compared to Task 1. If this potential difficulty can be attributed to the fact that switched copula constructions are rarely attested in spontaneous bilingual speech, then it is reasonable to suggest that participants were actually deploying their codeswitching norms in Task 1, where a preference for a default gender in Spanish det–English noun switches was observed in line with the spontaneously elicited data from the same bilingual community. Reaction times of an online task could help us determine whether bilinguals indeed experienced more difficulty with Task 2 compared to Task 1. The tasks employed in the present study were untimed for ecological validity purposes, and this is a limitation to the present study. Future studies should determine whether reaction times would be informative for the study of gender assignment in experimentally elicited responses to codeswitched speech.

The results for Task 1 align with the gender assignment strategies observed in spontaneously elicited Spanish–English codeswitched speech from a well-defined codeswitching community in Southern Arizona, U.S. (Cruz, 2021; DuBord, 2004). The experimental stimuli in the present study were modeled after the codeswitching patterns from this bilingual community studied in Cruz (2021). Participants were also recruited in Southern Arizona, and they reported to engage in habitual codeswitching practices themselves. Therefore, it is fair to suggest that an experimental design that reflects the codeswitching behavior of a well-defined codeswitching community can provide insightful information for a better characterization of the bilingual lexicon and the bilingual experience more generally. Future studies can apply an experimental approach to assess variation in codeswitching practices and language use across Spanish–English bilingual communities in the U.S. In particular, an experimental approach to the study of codeswitching can help us determine whether Spanish–English bilingual communities in the U.S. show similar or different gender assignment criteria in codeswitched speech on the basis of geographical proximity (e.g., Southern U.S. versus Northeastern U.S.). I hope future studies will shed some light in this direction.

Conclusion

The present study adopted an experimental design to examine gender assignment in Spanish–English codeswitched speech from a well-defined codeswitching community in Southern Arizona, U.S. Importantly, the experimental data corroborated the codeswitching patterns observed in naturally-occurring bilingual speech from the same bilingual community. I suggested that the prevailing preference for masculine gender in both naturally-occurring bilingual speech and experimentally elicited responses to codeswitched speech provides strong evidence of the codeswitching norms of this bilingual community. I emphasized the importance of applying experimental designs that reflect the codeswitching behavior of bilingual communities and the need to explore variation in codeswitching practices across Spanish–English bilingual communities on the basis of geographical proximity.

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Competing interests. The author declares none.

Supplementary Material. For supplementary material accompanying this paper, visit https://doi.org/10.1017/S1366728922000839
Appendix S1: List of target and distractor items
Appendix S2: List of carrier sentences for Task 1 & Task 2

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