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# Gender strategies in the perception and production of mixed nominal constructions by New Mexico Spanish-English bilinguals

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## Abstract

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This study investigated gender assignment strategies in mixed noun phrases containing a Spanish determiner and an English noun among Spanish-English bilinguals ( $n = 38$ ) in New Mexico (U.S.A.). Previous research has reported different gender assignment strategies based on a preference for a default determiner, the gender of the translation equivalent, or shape-based cues from the other language. The present study consisted of (i) a language background questionnaire, (ii) a two-alternative forced-choice judgment task, and (iii) two director-matcher tasks: a forced-switch task and a spontaneous card game. The results of the judgment task indicate that participants preferred the gender of the translation equivalent, i.e., *la window* ‘the.FEM window’ following the gender of the Spanish noun *la ventana*. Results from the production tasks also show that participants produced both gender congruent and incongruent mixed NPs, with Late English bilinguals producing more congruent mixed NPs, similar to the translation equivalent strategy found in the judgment task. These findings differ from those found in naturalistic speech in other New Mexican communities, which display a preference for a masculine default strategy. We suggest that the nature of participants’ bilingual profile and the community norms (urban setting, heterogeneous and diverse language contact profiles) may play a key role in the observed code-switching patterns in mixed noun phrases.

**Keywords:** code-switching, Spanish-English bilinguals, mixed NPs, gender assignment, New Mexico.

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## 1. Introduction

The study of gender assignment in mixed noun phrases (NPs) has been the focus of much research in the code-switching (CS) literature<sup>1</sup> (see Bellamy & Parafita Couto 2022 for an overview). How gender is assigned in mixed noun phrases is of particular interest for theories of CS since it constitutes a so-called “conflict site”, that is, a point where the two grammars do not align (Poplack & Meechan 1998). The conflict for Spanish-English bilinguals resides in the fact that English lacks grammatical gender, while Spanish has a binary masculine-feminine system. An example of a mixed Spanish-English noun phrase is *Ella es un renaissance woman* ‘She is a renaissance woman’ (Valdés Kroff 2016:291), where the inserted English noun ‘renaissance woman’ is assigned masculine gender, despite the referent being a female animate. Strategies for assigning gender to inserted English nouns have been shown to vary across bilinguals with different profiles, bilingual communities, as well as the type of data or task. Thus, the relative role and importance of structural or linguistic factors, as well as extralinguistic factors, including community norms and bilingual profile, remains to be more carefully unpicked (Parafita Couto, Greidanus Romeli & Bellamy, in press).

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<sup>1</sup> Note that we conceptualize code-switching (CS) here as the alternation of two or more languages in naturalistic discourse.

The current study aims to refine our understanding of the strategies involved when assigning gender in mixed NPs that contain a gendered Spanish determiner (*el<sub>M</sub>/la<sub>F</sub>*) and an ungendered English noun. More specifically, we examine the assignment of grammatical gender in mixed NPs as perceived and produced by Spanish-English bilinguals in New Mexico, U.S. The bilinguals in our study include speakers who actively use both Spanish and English, but who differ on the age they have been exposed to each language. As multiple studies and varied results have been reported on gender assignment in mixed NPs in Spanish and English language contact scenarios in the U.S., including in New Mexico (e.g., Clegg & Waltermire 2009; Aaron 2015), this study examines the nature of the gender strategies preferred and produced by this particular set of participants with their specific bilingual profiles. In particular, this study focuses on new data from Spanish-English mixed NPs in an urban setting in New Mexico (vs. rural communities in previous studies) and includes both perception and production tasks (vs. perception or production tasks in previous studies).

## 2. Background

In this section, we provide the necessary background and findings of previous studies in three areas. We begin with a summary of the characteristics of grammatical gender in Spanish (Section 2.1). We then review studies on gender assignment in mixed NPs, which are summarized based on (i) the types of assignment strategy used, and (ii) the nature of the tasks used in studies (i.e., perception and production tasks; Section 2.2). We conclude with a summary of research on mixed NPs based on the particular characteristics of the speaker communities, with a focus on New Mexico and its neighboring communities (Section 2.3).

### 2.1 Grammatical Gender in Spanish

In English there is no grammatical gender, whereas in Spanish all nouns belong to either the masculine or feminine gender class. The gender of nouns is important as Spanish syntactic rules require that all descriptors of the noun, namely determiners and adjectives, agree in gender with that noun (e.g., Corbett 1991). In Spanish, most animate nouns that have a biologically female referent in the real world correspond to feminine gender class, while most nouns with a male referent belong to the masculine gender class. In contrast, the gender classification of inanimate nouns is less transparent. In some cases, gender assignment follows a morphophonological pattern: *-o* is the canonical word ending for masculine nouns and *-a* for feminine nouns; the non-canonical word endings *-e* and *-consonant* can be either masculine or feminine (Agirre 2016; Kirova & Camacho 2021). The canonical word ending is considered the unmarked form in Spanish whereas the non-canonical ending is the marked counterpart (Harris 1991). In this regard, the majority of nouns in Spanish ending with *-o* are masculine (99.87%) and those with *-a* are feminine (96.30%) (Parafita Couto et al. 2015:306). The gender of words with non-canonical endings is harder to predict. However, in addition to */-a/* and */-o/* classified as canonical endings for feminine and masculine Spanish nouns, respectively, other researchers include */-n/*, */-r/*, */-s/*, */-e/*, and */-l/* as canonical endings for masculine Spanish nouns and */-ad/*, */-ion/*, and */-is/* as canonical endings for feminine Spanish nouns (Clegg & Waltermire 2009).

Nevertheless, when an English noun is inserted into a Spanish frame, it must be assigned a specific gender, either masculine or feminine, when co-occurring with

gender-bearing elements (determiners, adjectives) to fulfill the agreement requirements of Spanish syntax. In Spanish, masculine has also been reported to be the unmarked (or default) gender in comparison with the feminine in studies on loanwords (De la Cruz Cabanillas et al. 2007), first language acquisition (Pérez-Pereira 1991), and psycholinguistics (Domínguez et al. 1999). We will review briefly how this is done in the following sections.

### *2.2. Gender Assignment in Mixed NPs*

Previous research has reported three main gender assignment strategies in mixed NPs. The first is a preference for a default determiner, usually masculine, as in many Spanish-English communities (e.g., Balam 2016 in Northern Belize; Valdés-Kroff 2016 in Miami, Florida; Otheguy & Lapidus 2003 in New York City), as well as in various other language pairs, such as Russian-English, American Norwegian-English and American Lithuanian-English (Chirsheva 2009). That said, a feminine default has also been attested in American German-English and American Yiddish-English (Weinreich 1953:45). According to the second strategy, speakers assign the gender of the translation equivalent to the inserted noun; this strategy is also referred to as the ‘analogical criterion’ or ‘analogical strategy’ in some studies (e.g., Liceras et al. 2008). Language pairs in which this strategy has been reported include Tsova-Tush—Georgian (Bellamy & Wichers Schreur 2022), Russian-Estonian (Zabrodskaia 2009), and German-English (Fuller & Lehnert 2000). Liceras et al. (2008) also report a preference for this strategy amongst L1 Spanish-L2 English speakers in Spain. The third strategy takes morpho-phonological cues (in either spoken or written form) from the language of the inserted noun and reanalyses them as indicators of gender in the recipient language. This strategy is particularly visible in mixed Basque-Spanish NPs (Parafita Couto et al. 2015) and in the P’urhepecha-Spanish acceptability judgment task reported in Bellamy, Parafita Couto and Stadthagen-González (2018).

Various methods are used to investigate gender assignment strategies in mixed NPs, including, but not restricted to, spontaneous speech (i.e., a corpus), semi-spontaneous speech as elicited through structured interviews, or interactive tasks such as the director-matcher task used in the present study (Gulberg, Indefrey & Muysken 2009). It is noteworthy that some multi-method studies have reported different assignment strategies in different tasks: For P’urhepecha-Spanish (Mexico), Bellamy et al. (2018) found an overwhelming preference for the masculine default strategy in a production task, but a preference for the shape-based strategy in an online acceptability judgment task. Similarly, Bierings et al. (2019) also found what is likely to be a task effect with Kaqchikel-Spanish bilinguals in Guatemala. As such, naturalistic and elicited data should be collected and analyzed for both production and perception in order to tease apart naturalistic patterns from possible task effects (Bellamy & Parafita Couto 2022).

### *2.3. Gender Assignment in mixed Spanish-English NPs: New Mexico and similar communities in the U.S.*

According to the United States Census Bureau (2019), a little more than 26% of the New Mexican population speaks Spanish at home. Bilingual competence does not prompt CS but rather “natural CS usually requires that the other person be not just bilingual, but natively bilingual of the same background” (Bills & Vigil 2008:166). This has been demonstrated in studies on New Mexican Spanish-English bilingual communities that attest to the presence of CS phenomena among this bilingual

community, such as the incorporation of lone English-origin nouns into Spanish discourse (Aaron 2015; Clegg & Waltermire 2009), and the use of bilingual compound verbs (Wilson & Dumont 2015; Jenkins 2003).

The present study focuses on the gender assignment strategies preferred and produced by Spanish-English bilinguals in New Mexico. The preference and use of these strategies have been documented to vary according to the nature of bilingual profiles. In northern New Mexico, Aaron (2015) found a preference for the use of masculine default in naturalistic speech. Similarly, Clegg and Waltermire's (2009) results from the analysis of more naturalistic bilingual speech from sociolinguistic interviews in northern New Mexico also confirm the preference for a masculine default strategy.

A more recent usage-based study on the use of mixed NPs in New Mexico using the New Mexico Spanish-English Bilingual (NMSEB) corpus (Torres Cacoullos & Travis 2018), Trawick and Bero (2022) found that a variety of constraints (e.g., analogical gender, phonological shape, syntactic role, and determiner definiteness) influenced gender assignment for 707 mixed NPs containing only inanimate nouns. That said, their results on the rates of gendered determiner assignment (15% feminine, 85% masculine) are in line with previous work on gender assignment to English nouns in Spanish discourse. Regarding analogical gender, they found that feminine analogical equivalency increases the likelihood, though does not guarantee, that English nouns will be produced with a feminine determiner than English nouns with masculine translation equivalents. For phonological shape, they attribute the disproportionate use of the masculine default to the productivity of the masculine gender in monolingual Spanish. Lastly, for syntactic role and definiteness, they found that English nouns tended to be assigned feminine gender when they functioned as a subject and occurred with an indefinite determiner. They concluded that bilingual outcomes (i.e., mixed NPs) can be influenced by both bilingual constraints (e.g., analogical gender) and monolingual constraints (e.g., phonological shape, syntactic role, and definiteness).

Detailed information of the profile of the speakers was not provided except for the fact that all of them were “minimally third-generation *Nuevomexicanos* who regularly use both Spanish and English without change in topic, situation, or interlocutor, and without specific rhetorical motivation” (Trawick & Bero 2022:185). The similar results shared by the abovementioned studies related to New Mexico Spanish-English bilingual communities may be attributed to the similarities in data collection methods and participants' language profiles. Neither study utilized experimental tasks (i.e., forced-choice judgment task or toy tasks) to collect data; rather, they analyzed sociolinguistic interviews from two separate corpora: the New Mexico-Colorado Spanish Survey (NMCROSS) and the New Mexico Spanish-English Bilingual corpus (NMSEB). The participants from the NMCROSS were all Spanish-English bilinguals who were born and raised in New Mexico, or southern Colorado, and acquired Spanish during their childhood (Bills & Vigil 2008:25), while the participants from the NMSEB were early bilinguals who regularly used Spanish and English in the same conversation, that is, they regularly code-switched (Aaron 2015:461). Additionally, CS utterances found in both mentioned corpora correspond to speech from previous decades.

Chaston (1996) and DuBord (2004) analyzed CS in noun phrases in neighboring states to New Mexico. Chaston's (1996) study reveals examples of mixed noun phrases found in the naturalistic speech of Spanish-English bilinguals of Mexican

heritage in Texas. All participants maintained competent communicative abilities in both languages, and were university students, who had learned Spanish in the home and other informal environments, without formal training or instruction in the language. He suggests that words assigned non-traditional gender markers were likely learned outside of the home environment and likely to be English cognates. Out of the total of 42 mixed noun phrases, 40 were examples of masculine default strategy. According to Chaston, these results could be due to a tendency to use the masculine when unsure of the assigned gender or a tendency to use the masculine with English words or new cognates (Chaston 1996:201; see also Delgado 2018 on Spanish-English bilinguals in Chicago).

Data from Mexican-American English and Spanish speakers in Southern Arizona also confirms a preference for a masculine default strategy (DuBord 2004). All interviews were conducted either in pairs (seven interviews) or with multiple people present (11 interviews). Participants' ages ranged from 18 to 56 years old. The language profile for bilinguals (4 interviews were from Spanish monolinguals) consisted of three Spanish-dominant bilinguals, six balanced bilinguals, and five English-dominant bilinguals. Of the 174 tokens examined in mixed NPs, 130 were examples of the masculine default strategy (74.7%) and 43 (24.7%) were assigned feminine gender. Biologically masculine animate referents received masculine assignment in 96% of cases, while feminine assignment to feminine animates was 75%. Phonologically masculine nouns were assigned masculine gender in 82% of cases vs. 39% with feminine gender. Phonologically neutral tokens were assigned masculine gender primarily (71%). The preference for masculine gender with phonologically and biologically feminine nouns was interpreted as an indicator of a default strategy. Another study with CS data from Southern Arizona was conducted by Cruz (2021) using the *Corpus del Español en el Sur de Arizona* (CESA) corpus (Carvalho 2012). The study included 76 sociolinguistic interviews of one hour from 53 Spanish-English bilingual speakers with ages ranging from 22 to 63 years old. Participants in Cruz' study grew up either simultaneous or sequential *child* bilinguals (i.e., Ortega 2020). The data from CESA corpus provides support for biological gender as a reliable predictor for gender assignment in CS. Masculine is a prevailing default gender in the corpus, which is consistent with previous findings in areas surrounding New Mexico (Dubord 2004; Clegg & Waltermire 2009; Aaron 2015).

The Spanish-English language contact situation in New Mexico and surrounding areas, though comparable to other communities where the same languages interact, is unique due to the diverse nature of bilingual profiles. Such is the case regarding the gender strategies employed in Granada (Spain), San Juan (Puerto Rico, U.S.A.), and El Paso, Texas (U.S.). Królikowska et. al (2019) compared data on gender assignment in mixed noun phrases in these communities, using data from a director-matcher task. They found that the translation equivalent and default strategies were used in all communities, either with similar frequency (El Paso and Granada), or one strategy was used more frequently than the other, such as the masculine default strategy in Puerto Rico. Bilinguals from Puerto Rico showed the highest rate of codeswitching at around 24%, while bilinguals from Granada had the lowest at 2%. These data suggest that the more the bilinguals engage in CS, the greater their likelihood to employ a default masculine strategy in mixed NPs (see also Beatty-Martínez & Dussias 2019). These findings related to the frequency of CS may be a reflection of community norms and not necessarily generalizable and applicable to

other bilingual speakers with the same language pair (in this case, Spanish and English: Aaron 2015; Beatty-Martínez et al. 2018).

The naturalistic speech of Spanish-English bilinguals from Miami, Florida (U.S.A.), as recorded in the Bangor Miami corpus, has also been examined (Valdés-Kroff 2016). In this sample, 62% of speakers were females, 73% rated their proficiency as high in both languages, and ages ranged from nine to 66 years old. Valdés-Kroff (2016) found that the preferred gender assignment strategy was overwhelmingly the masculine default. The following table, Table 1, summarizes the main findings, participants and tasks in similar linguistic interactional bilingual contexts to New Mexico in the US.

**Table 1.** Overview of studies on Spanish-English mixed NPs in the US

<b>Studies- mixed NPs (Spanish-English)</b>	<b>Area in the US</b>	<b>Participants</b>	<b>Task(s)</b>	<b>Gender assignment strategy</b>
<i>Chaston 1996</i>	<i>Texas</i>	<i>18 Spanish-English young adults bilinguals of Mexican heritage</i>	<i>Naturalistic speech</i>	<i>Preference masculine default</i>
<i>DuBord 2004</i>	<i>Southern Arizona</i>	<i>4 Spanish monolinguals, 3 Spanish-dominant bilinguals, 6 balanced bilinguals, and 5 English-dominant bilinguals</i>	<i>Naturalistic speech</i>	<i>Preference masculine default</i>
<i>Clegg &amp; Waltermire 2009</i>	<i>Northern New Mexico &amp; Southern Colorado</i>	<i>4 speakers from the NMCOSS corpus and 11 from NM</i>	<i>Naturalistic speech</i>	<i>Preference masculine default</i>
<i>Aaron 2015</i>	<i>Northern New Mexico</i>	<i>20 Spanish-English bilingual speakers from the NMSEB corpus</i>	<i>Naturalistic speech</i>	<i>Preference masculine default</i>
<i>Valdés-Kroff, 2016</i>	<i>Florida</i>	<i>85 Spanish-English bilinguals from the Bangor Miami corpus</i>	<i>Naturalistic speech</i>	<i>Preference masculine default</i>
<i>Królikowska et.al. 2019</i>	<i>Puerto Rico &amp; Texas</i>	<i>Subset of data from 100 Spanish-English bilingual young adults from different communities (San Juan, PR and El Paso, TX with similar interactional contexts to NM)</i>	<i>Director Matcher</i>	<i>Bilinguals in San Juan (PR)- preference for masculine default. Bilinguals in El Paso (TX)- preference for translation equivalents</i>
<i>Cruz 2021</i>	<i>Southern Arizona</i>	<i>53 Spanish-English bilingual speakers from the CESA corpus</i>	<i>Naturalistic speech</i>	<i>Preference for masculine default</i>



<i>Trawick &amp; Bero 2022</i>	<i>Northern New Mexico</i>	<i>40 speakers from the NMSEB corpus</i>	<i>Naturalistic Speech</i>	<i>Preference for masculine gender. However, analogical gender, phonological shape, definiteness, and syntactic role influence the use of feminine gender in mixed NP with nouns with feminine translation equivalents.</i>
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To conclude this section, it is important to note that previous studies on gender assignment of mixed Spanish-English noun phrases in similar communities to New Mexico focus on production data from naturalistic speech, primarily from corpora (Aaron 2005; Clegg & Waltermire 2009; DuBord 2004; Valdés-Kroff 2016), with the exception of the findings reported by Królikowska et. al (2019) from director-matcher tasks.

### 3. The Present Study

Following the on-going discussion of gender assignment in mixed NPs, the goal of the present study is to identify and explain the strategy, or strategies, that Spanish-English bilinguals living in New Mexico (U.S.A.) employ when applying Spanish gender to inserted English nouns. New Mexican Spanish is abundant in code-switched utterances (Bills & Vigil 2008; Wilson & Martinez 2011), therefore this variety of Spanish represents a good additional test case for better understanding gender assignment in bilingual speech. Our study builds on previous research and findings by means of perception and production tasks, which enable us to compare results with similar communities to New Mexico in terms of types of bilinguals and community norms. We address the following research questions:

1. What strategy or strategies do New Mexican Spanish-English bilinguals employ to assign gender to English nouns in otherwise Spanish speech? More specifically:
  - 1.1. Do they prefer the gender of the translation equivalent?
  - 1.2. Do they prefer the phonological, or shape-based criterion? And/or:
  - 1.3. Do they prefer a default gender, likely masculine?
2. Is there a difference in strategy assignment in terms of task type?
3. Does the profile of the bilingual (and/or other factors) influence the strategy assignment per task? If so, how?

### 4. Methodology

#### 4.1 Participants

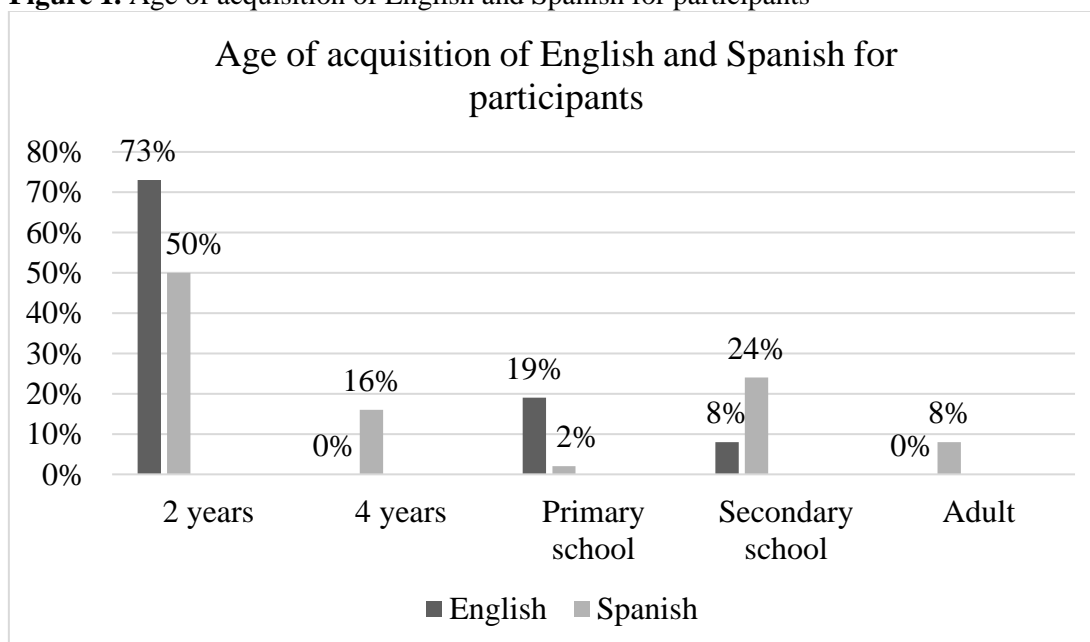
Thirty-eight bilinguals in the state of New Mexico (U.S.A.) participated in the present study. Participants were recruited from the Albuquerque metropolitan area, New Mexico's largest city (2022 population estimate: 942,000). The bilingual profiles of these participants differ from those of previous studies of Spanish-English bilinguals

in New Mexico and similar areas in the United States. The participants in other New Mexico studies (see Clegg & Waltermire 2009, Aaron 2015, and Trawick & Bero 2022) had spent most of their lives in more rural communities in northern New Mexico (Torres Cacoullous & Travis 2015:376). In contrast, the bilingual speakers in our study are more representative of the diversity of population in the metropolitan area of Albuquerque and surrounding areas. As such, 39.5% of participants reported having lived in New Mexico only ( $n = 15$ ), while more than 60% ( $n = 23$ ) of participants lived in different parts of the U.S. (e.g., Texas, California, and Illinois) or other countries (e.g., Colombia, Costa Rica, and Mexico) before moving to New Mexico. From the latter group of participants, 57% ( $n = 13$ ) reported to have lived in New Mexico for the last 10 years or more (mean number of years = 19, ranging from 10 to 48 years living in the state).

Taking all this information together, the participants in our study were primarily either born in New Mexico and have lived there since birth or had lived in the state for at least a decade at the time of participation. This diverse sample reflects the overall population landscape of the metropolitan area of Albuquerque. According to the U.S. Census population estimates from 2019 (included in World Population 2019-2022), about 53% of the population of Albuquerque was born in the state of New Mexico, while about 36% was born in another U.S. state or territory. The remaining 11% of the Albuquerque population was born outside of the U.S., with approximately 38,000 individuals, or 7%, born in Latin American countries.

All participants in the present study were college students, with an age range of 19 to 57 years old (mean = 25,  $SD = 9.94$ ). In terms of age of acquisition of English and Spanish, 73% of participants ( $n = 27$ ) were exposed to English since they were 2-4 years old, and 66% ( $n = 25$ ) exposed to Spanish since they were 2-4 years old (see Figure 1). As compared to other states where college students may be “transitional” and move out of the state after graduation, the majority of the college students in New Mexico stay, and secure jobs in-state, primarily in Albuquerque and Santa Fe.

**Figure 1.** Age of acquisition of English and Spanish for participants

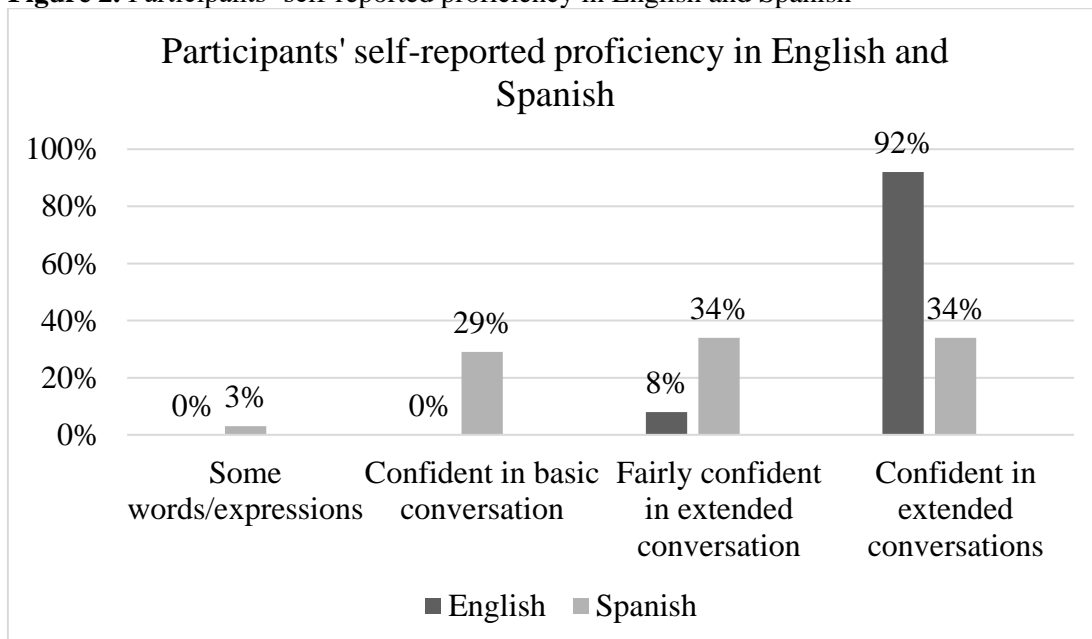


Participants' responses to the background questionnaire were used to identify three groups: 1) Early bilinguals ( $n = 23$ ), 2) Late English bilinguals ( $n = 3$ ), and 3) Late Spanish bilinguals ( $n = 12$ ). Early bilinguals in our study fall within the parameters established in Liceras et al.'s (2008) definition of simultaneous bilinguals, that is, "individuals who acquire their two languages simultaneously from an early age (before puberty)" (p. 828). Additionally, late learners of English or Spanish are those who acquired their second language after puberty. Early bilinguals are individuals who acquired Spanish and English at or before the age of four or during elementary school; Late English bilinguals are individuals who acquired English in middle school, 11-14 years old ( $n = 3$ ); and Late Spanish bilinguals are individuals who acquired Spanish in middle school or as adults.

#### 4.2 Participant Proficiency

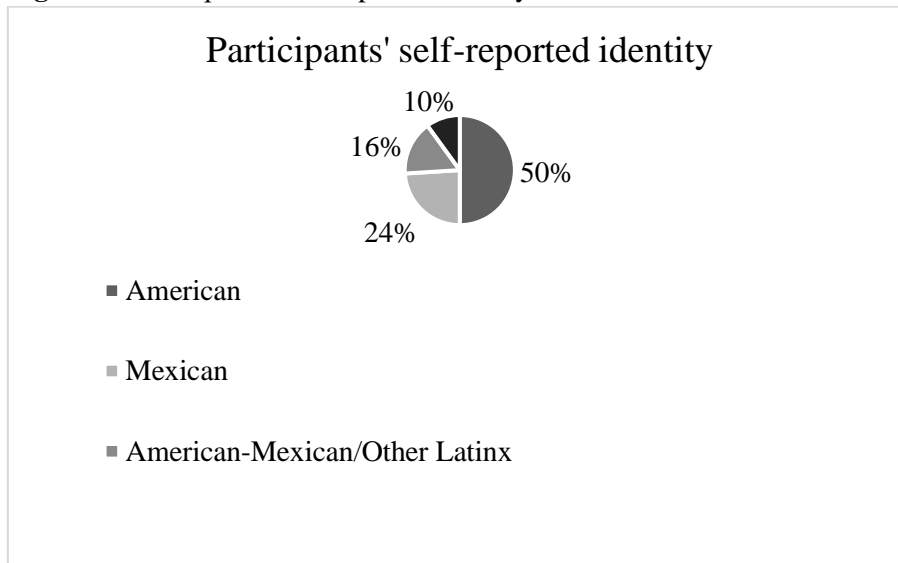
Participants were asked to self-rate how confident they felt when engaging in a conversation in English and in Spanish. Figure 2 reveals that all participants ( $n = 38$ ) felt confident using English in extended conversations. In contrast, 68% participants ( $n = 26$ ) felt confident using Spanish in extended conversations, while 29% of participants ( $n = 11$ ) felt confident in basic conversations in Spanish. One participant reported confidence in Spanish only when using some words or expressions (3%). Overall, results indicated that participants' self-confidence when speaking Spanish is not as high as in English.

**Figure 2.** Participants' self-reported proficiency in English and Spanish



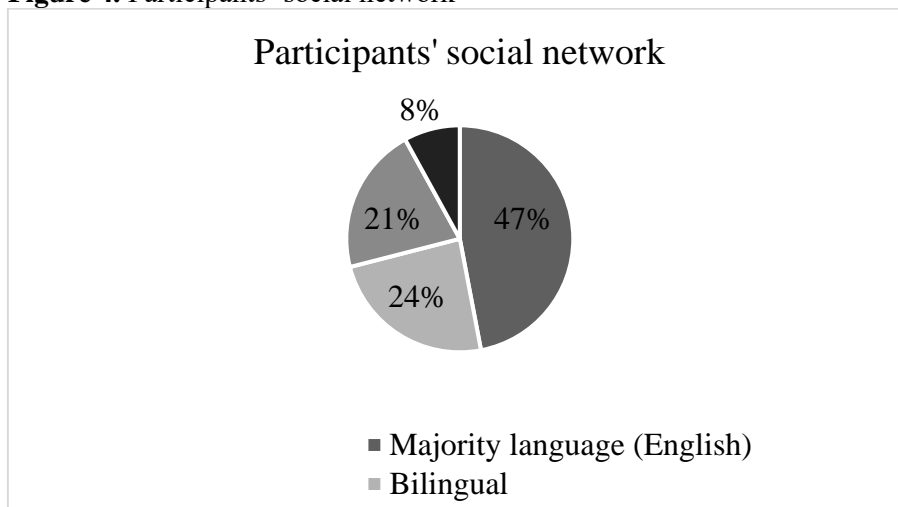
#### 4.3 Participant Identity

With reference to how participants self-reported their social identity, the results were quite varied (Figure 3): 50% ( $n = 19$ ) self-identified as American, 24% ( $n = 9$ ) as Mexican, 16% ( $n = 6$ ) as mixed identities such as American-Mexican, Colombian or Chicax, and 10% ( $n = 4$ ) as Other Latinx (i.e., Puerto Rican, Colombian, Venezuelan, Costa Rican).

**Figure 3.** Participants' self-reported identity

#### 4.4 Social Identity in New Mexico

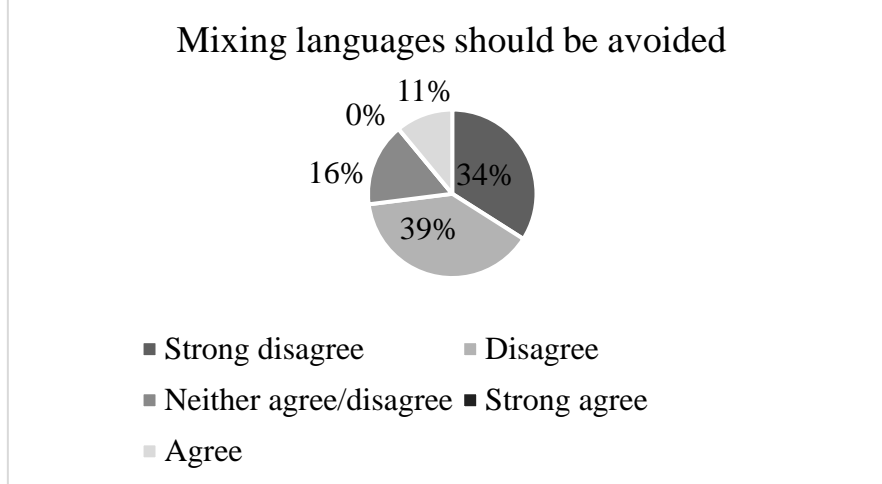
The results of the social network analysis are illustrated in Figure 4. Participants were asked which languages they are exposed to in various contexts, such as household, school, friends, and work. Means were calculated for the main language of speakers' social network in the majority language of New Mexico, English. A result labeled "bilingual" indicates that the speakers use both languages in their social networks. A result labeled "minority language" signifies that Spanish was reported as the main language of speakers' social network. The results here are also quite varied. Participants in our study generally have a bilingual network score (24%), followed by a minority (Spanish) network score (21%), and a majority (English) language score (18%).

**Figure 4.** Participants' social network

#### 4.5 Perceptions of Attitudes regarding Mixing Languages (Spanish-English)

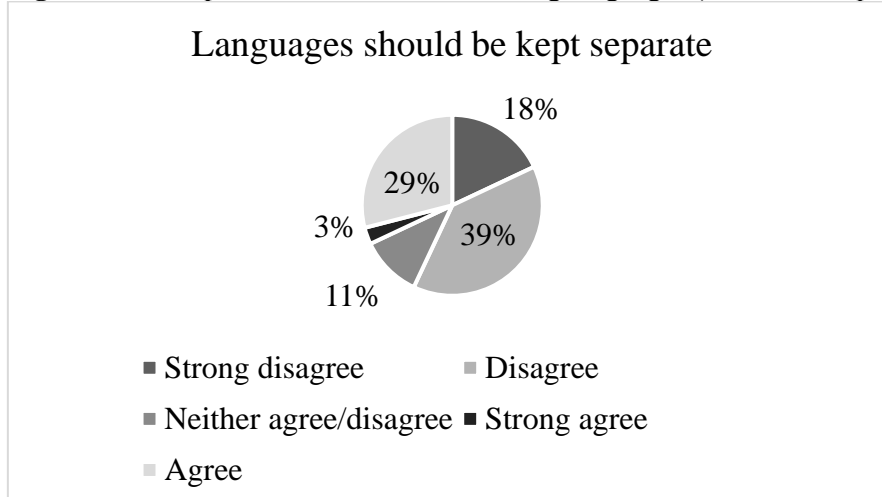
When asked about self-perceptions of mixing languages in their community, participants mostly offered a positive view. As demonstrated in Figure 5, taken together, 73% ( $n = 28$ ) of participants considered that mixing languages should not be avoided, while some others (16%,  $n = 6$ ) either did not show a preference for (dis)agreement with this position. A minority indicated a preference for the avoidance of mixing languages (11%,  $n = 4$ ).

**Figure 5.** Participants' attitudes toward mixing languages (Should be avoided)



The results presented in Figure 5 match with the results concerning whether languages should be kept separate. As shown in Figure 6, 57% of participants ( $n = 22$ ) considered that languages should not be kept separate, while 32% of participants ( $n = 12$ ) indicated that languages should be separated. A minority of participants, 11% ( $n = 4$ ) did not indicate any preference.

**Figure 6.** Participants' attitudes toward mixing languages (Should be kept separate)



#### 4.6 Materials and Procedure

Participants completed a language background questionnaire, a two-alternative forced-choice judgment task (based on Stadthagen-González et al. 2018) and two director-matcher tasks: a forced-switch task and a spontaneous card game, adapted from Gullberg et al. (2009). Researchers greeted participants in the lab in CS mode, mixing both English and Spanish for the duration of the experiment to avoid triggering a language preference and potential priming effects. Participants were not given a Spanish proficiency test as all of them except one were enrolled in advanced Spanish coursework at the University of New Mexico<sup>2</sup>.

##### 4.6.1. Acceptability judgment task

For the acceptability judgment task, twenty-four pairs of sentences containing mixed NPs were presented auditorily using *Superlab* software, where ten pairs included English nouns with a masculine Spanish translation equivalent, and another ten pairs with a feminine equivalent (Examples: *El nose de María es grande* and *La nose de María es grande*). All mixed NPs were in subject position and did not include adjectives. To ensure that participants remained on task, the remaining four pairs of sentences included nonce words, e.g., *Lar book me intrisca bien* and *El book me interesa mucho*. These sentences were not included in this analysis, but it should be noted that they were all answered correctly. In the 20 stimulus pairs, there were five pairs of sentences for each combination of gender and canonical type in Spanish, that is, masculine canonical, feminine canonical, masculine non-canonical, and feminine non-canonical. For this study, canonicity (i.e., canonical and non-canonical endings) refers to the terminal phoneme of the Spanish translation equivalent of stimuli presented or produced in all tasks (see Section 2.1).

Participants were asked to evaluate the acceptability of sentences containing a mixed NP through a two-alternative forced-choice acceptability task (Stadthagen-González et al. 2018). The instructions informed participants that they would hear a series of sentence pairs and asked them to pick the one closer to the way they would speak to another bilingual person. They were asked to make a choice even if both sentences sound ‘right’ or ‘wrong’. Each pair of sentences was presented one at a time and the order of presentation of the pairs was individually randomized for each participant. Participants had to make a choice by pressing a button for each test item before progressing to the next one and were not able to return to previous sentences.

The following provides examples of the distribution of the selected pairs:

	<u>Option A</u>	<u>Option B</u>
(1)	El <sub>M</sub> book es interesante the.M book be.3SG interesting Span. <i>El libro</i> (MASC ending –o, canonical) ‘The book is interesting’	La <sub>F</sub> book[...] The <sub>F</sub> book... ‘The book...’

<sup>2</sup> Performance descriptors in advanced curriculum equivalent to *Advanced Mid* level of proficiency in Spanish following international standardized testing of American Council of Teaching Foreign Languages (ACTFL).

(2)	El <sub>M</sub> bridge cruza todo el río the.M bridge cross.3SG all the river Span. <i>El puente</i> (MASC not ending <i>-o</i> , non-canonical) ‘The bridge crosses the whole river’	La <sub>F</sub> bridge[...] The <sub>F</sub> bridge... ‘The bridge...’
(3)	El <sub>M</sub> window no cierra bien the.M window not close.3SG well Span. <i>La ventana</i> (FEM ending <i>-a</i> , canonical) ‘The window does not close well’	La <sub>F</sub> window[...] The <sub>F</sub> window... ‘The window...’
(4)	El <sub>M</sub> nose de María es grande the.M nose of María be.3.SG big Span. <i>La nariz</i> (FEM not ending <i>-a</i> , non-canonical) ‘María’s nose is big’	La <sub>F</sub> nose [...] The <sub>F</sub> nose... ‘The nose...’

#### 4.6.2. Toy Tasks

Two toy tasks, also known as director-matcher tasks, were run: a forced-switch task and a natural one. In the forced toy task, one participant, the director, instructed the other participant, the matcher, where to locate certain objects (displayed as pictures on individual cards) on a board. In order to elicit mixed noun phrases, participants were asked to speak in Spanish but to name the objects in English to elicit the production of a Spanish masculine or feminine determiner (adapted from Bellamy et al. 2018 for P’urhepecha-Spanish).

In the natural toy task, the director instructed the other participant where to locate the objects on the board but there were no instructions for either of the participants regarding what language they should use when performing the task and/or naming the objects. Since the toy tasks were similar in design, half of the participants (19/38 total) completed the forced toy task first followed by the language background questionnaire, judgment task and natural toy task. The other half of the participants completed the natural toy task first followed by the language background questionnaire, judgment task and forced toy task.

A total of twelve objects were presented in the forced toy task: three nouns in four different conditions: (1) masculine noun ending in *-o* (Spanish *libro* ‘book’, *zapato* ‘shoe’, and *barco* ‘ship’); (2) masculine noun not ending in *-o* (Spanish *avión* ‘plane’, *corazón* ‘heart’, and *tren* ‘train’); (3) feminine noun ending in *-a* (Spanish *ventana* ‘window’, *mesa* ‘table’, and *puerta* ‘door’); and (4) feminine noun not ending in *-a* (Spanish *nariz* ‘nose’, *nube* ‘cloud’ and *torre* ‘tower’). None of the stimuli with feminine translation equivalents ended in the terminal phonemes in Spanish /-ad/ or /-ion/, which Clegg and Waltermire (2009) consider traditionally feminine. In the natural toy task, a total of sixteen objects were presented: we included eight objects from the forced toy task (two per condition- see words displayed in bold in Table 2) and two additional objects per condition were added.

**Table 2.** Objects and conditions used in toy tasks (12 objects in forced-toy task and 16 objects in natural toy task, marked in bold)

Gender and Canonical Type	Stimuli ( <i>Spanish</i> ‘English Translation’)
<i>‘the.M’</i> <i>Spanish masculine ending with –o</i>	1. <i>ojo</i> ‘eye’ 2. <i>queso</i> ‘cheese’ 3. <b><i>libro</i></b> ‘book’ 4. <b><i>zapato</i></b> ‘shoe’
<i>‘the.M’</i> <i>Spanish masculine not ending with –o</i>	1. <i>árbol</i> ‘tree’ 2. <i>puente</i> ‘bridge’ 3. <b><i>avión</i></b> ‘plane’ 4. <b><i>corazón</i></b> ‘heart’
<i>‘the.F’</i> <i>Spanish feminine ending with –a</i>	1. <i>roca</i> ‘rock’ 2. <i>silla</i> ‘chair’ 3. <b><i>ventana</i></b> ‘window’ 4. <b><i>puerta</i></b> ‘door’
<i>‘the.F’</i> <i>Spanish feminine not ending with –a</i>	1. <i>llave</i> ‘key’ 2. <i>leche</i> ‘milk’ 3. <b><i>nariz</i></b> ‘nose’ 4. <b><i>nube</i></b> ‘cloud’

## 5. Results

Table 3 provides an overview of participants’ responses for the three tasks conducted in this study. Gender congruency here refers to those instances where the grammatical gender of the determiner in mixed NPs corresponds to the gender of the noun of the Spanish translation equivalent. The masculine congruent nouns in our study include el.MASC *bridge* Spanish (cf. *el puente*), masculine incongruent nouns include el.MASC *cloud* (cf. *la nube*), feminine congruent includes *la<sub>Fem</sub> table* (cf. *la mesa*), and feminine incongruent *la<sub>Fem</sub> heart* (cf. *el corazón*). In subsections 5.2 and 5.3, only the data from mixed NPs with a Spanish feminine translation equivalent are presented, since these are the only examples where incongruence can be identified.

**Table 3.** Distribution of responses from the three tasks

	Forced-choice Judgment Task	Natural Toy Task	Forced-switch Toy Task
<i>Masculine Congruent</i>	310 (41%)	20 (49%)	271 (53%)
<i>Masculine Incongruent</i>	70 (9%)	0 (0%)	21 (4%)
<i>Feminine Congruent</i>	241 (32%)	13 (32%)	115 (22%)
<i>Feminine Incongruent</i>	139 (18%)	8 (19%)	106 (21%)
<b>TOTAL</b>	760	41	513

Table 3 illustrates that, in all tasks, masculine congruent responses were the most frequent response type, followed by feminine congruent, feminine incongruent and finally masculine incongruent, where it occurs.

### 5.1 Results for forced-choice judgment task

A total of 760 responses were provided by the 38 participants in the forced-choice judgment task. For the translation equivalent of Spanish canonical ending stimuli,



masculine stimuli were congruent in 81.1% of cases and feminine stimuli were congruent in 67.9% of cases (see Table 4)<sup>3</sup>.

**Table 4.** Distribution of responses from forced-choice judgment task for canonical ending stimuli

	<b>Masculine Canonical</b>	<b>Feminine Canonical</b>
<i>Congruent</i>	154 (81.1%)	129 (67.9%)
<i>Incongruent</i>	36 (18.9%)	61 (32.1%)
<b>TOTAL</b>	190	190

Examples (1) and (2), taken from the judgment task, represent stimuli whose Spanish translation equivalents have canonical endings, namely *el libro* ‘book’ and *la ventana* ‘window’. The results from this task indicate that, for both stimuli, participants chose congruent mixed NPs, such as Option A in Examples (1) and (2) more than incongruent mixed NPs, such as Option B (see Table 4; 81.1% vs. 18.9% for masculine nouns, and 67.9% vs. 32.1% for feminine nouns).

Option A

- (1) El book es interesante  
 the.M book be.3SG interesting  
 ‘The book is interesting’

Option B

La<sub>F</sub> book es interesante  
 the.F book be.3SG interesting  
 ‘The book is interesting’

Option A

- (2) La<sub>F</sub> window no cierra bien  
 the.F window not close.3SG well  
 ‘The window does not close well’

Option B

El<sub>M</sub> window no cierra bien  
 the.M window not close.3SG well  
 ‘The window does not close well’

**Table 5.** Distribution of responses from forced-choice judgment task for non-canonical ending stimuli

	<b>Masculine Non-canonical</b>	<b>Feminine Non-canonical</b>
<i>Congruent</i>	156 (82.1%)	112 (58.9%)
<i>Incongruent</i>	34 (17.9%)	78 (41.1%)
<b>TOTAL</b>	190	190

<sup>3</sup> Since the two conditions for gender that were manipulated were only FEM and MASC, the requirements for Thurstone’s law of comparative judgements did not apply. As a result, this analysis was not conducted, following a similar study on mixed P’urhepecha-Spanish nominal constructions, which contains a similar design and also did not perform such a statistical test (Bellamy et al. 2018).

For the stimuli whose Spanish translation equivalents have non-canonical endings, the masculine stimuli were congruent in 82.1% of instances and feminine stimuli in 58.9% (see Table 5). Examples (3) and (4) illustrate the kind of choice participants made, using two non-canonical ending translation equivalents, namely *el puente* ‘bridge’ and *la leche* ‘milk’. The results from this task indicate again that, for both stimuli types, participants chose congruent mixed NPs, such as Option A in Examples (3) and (4) more than Option B.

Option A  
 (3) El<sub>M</sub> bridge cruza todo el río  
 the.M bridge cross.3SG all the river  
 ‘The bridge crosses the whole river’

Option B  
 La<sub>F</sub> bridge cruza todo el río  
 the.F bridge cross.3SG all the river  
 ‘The bridge crosses the whole river’

Option A  
 (4) La<sub>F</sub> milk no me gusta mucho  
 the.F milk not to.me like.3SG much  
 ‘I don’t like milk very much’

Option B  
 El<sub>M</sub> milk no me gusta mucho  
 the.M milk not to.me like.3SG much  
 ‘I don’t like milk very much’

**Figure 7.** Results for two-alternative forced-choice judgment task

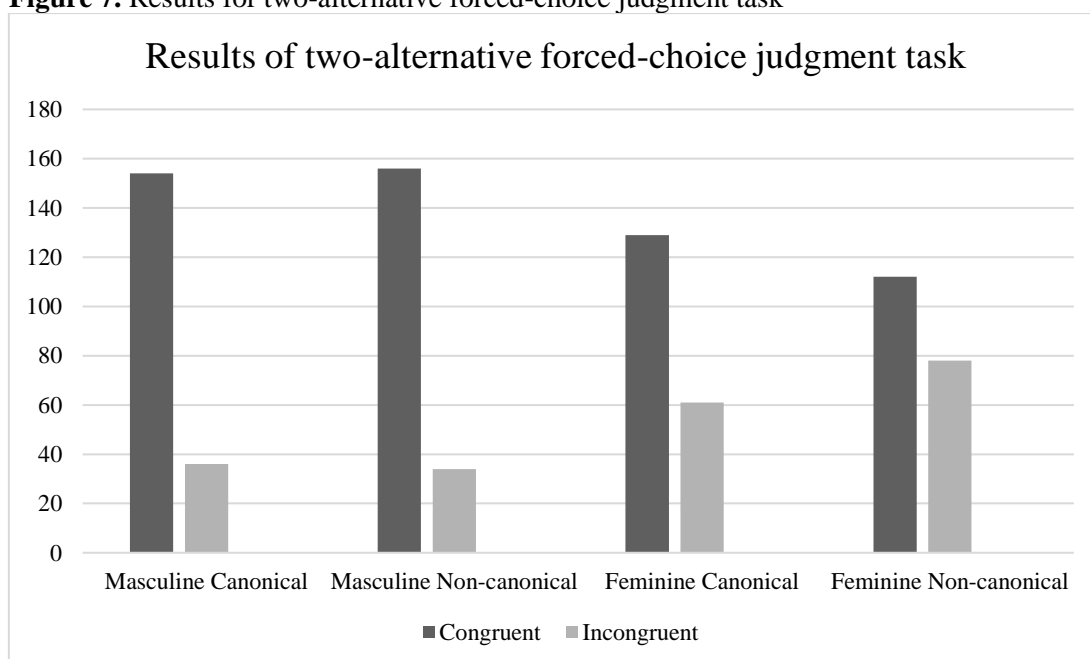


Figure 7 presents the data from Tables 4 and 5. The results from the two-alternative forced-choice judgment task indicate that, regardless of gender and canonical type, masculine stimuli were congruent in 81.6% of all cases and feminine stimuli in 63.4%. That is, participants preferred to match the English noun with the Spanish determiner that represented the gender of the translation equivalent, especially for masculine nouns. These results suggest that the translation equivalent strategy is the preferred strategy.

Table 6 demonstrates the percentage distribution of congruent and incongruent mixed NPs for each bilingual group (i.e., Early, Late Spanish, and Late English) for the forced-choice judgment task; it focuses solely on the responses to stimuli with feminine translation equivalents. We can observe that the participants from the Late English bilingual group exclusively preferred mixed NPs that were congruent with the gender of the Spanish translation equivalent. Sixteen participants (69.6%) from the Early bilingual group preferred congruent mixed NPs, while five participants (21.7%) preferred incongruent mixed NPs, and two participants (8.7%) showed an equal preference for congruent and incongruent mixed NPs. For the Late Spanish bilinguals, half of the participants ( $N = 6$ ) preferred congruent mixed NPs, five participants (41.7%) preferred incongruent mixed NPs, and one participant (8.3%) from this bilingual group preferred congruent and incongruent mixed NPs at the same rate. Overall, all bilingual groups showed a preference for producing congruent mixed NPs, that is, choosing the feminine Spanish determiner with feminine stimuli.

**Table 6.** Congruency percentages for bilingual groups (Stimuli with Spanish feminine translation equivalents)

	Early Bilingual	Late Spanish	Late English
<i>Congruent</i>	16 (69.6%)	6 (50%)	3 (100%)
<i>Incongruent</i>	5 (21.7%)	5 (41.7%)	0
<i>50% Congruent/ 50% Incongruent</i>	2 (8.7%)	1 (8.3%)	0
<b>TOTAL PARTICIPANTS</b>	23	12	3

### 5.2 Results of Natural Toy Task

Of the 905 NPs extracted from 38 natural toy task recordings, only 62 mixed NPs (6.9%) were produced by 16 participants. Of the 62 mixed NPs, 21 contained an English determiner and a Spanish noun (e.g., the *leche*, ‘the milk’), while 41 had a Spanish determiner and an English noun (e.g., *el* tree, ‘the tree’). Since the present study focuses on the strategies used in gender assignment, only the results of the 41 mixed NPs containing Spanish determiners and English nouns will be presented. Of these 41 mixed NPs, 20 had masculine translation equivalents and were congruent, that is, produced with a Spanish masculine determiner. Of the remaining 21, 13 had feminine translation equivalents and were congruent with the Spanish translation equivalent (see Table 7).

**Table 7.** Mixed NPs containing nouns a feminine determiner and an English noun with a Spanish feminine translation equivalent

Mixed NP	Translation Equivalent	Total	Gender & Canonical Type in Spanish
<i>la chair</i>	<i>la silla</i>	4	<i>Feminine Canonical</i>
<i>la window</i>	<i>la ventana</i>	2	<i>Feminine Canonical</i>
<i>la door</i>	<i>la puerta</i>	2	<i>Feminine Canonical</i>
<i>la nose</i>	<i>la nariz</i>	2	<i>Feminine Non-canonical</i>
<i>la cloud</i>	<i>la nube</i>	1	<i>Feminine Non-canonical</i>
<i>la milk</i>	<i>la leche</i>	1	<i>Feminine Non-canonical</i>
<i>la key</i>	<i>la llave</i>	1	<i>Feminine Non-canonical</i>
<b>TOTAL</b>		13	

The remaining eight mixed NPs contained a noun whose Spanish translation equivalent is feminine but were attested with a masculine determiner. Table 8 shows the incongruent mixed NPs that were produced during this task.

**Table 8.** Mixed NPs containing a masculine determiner and an English noun with a Spanish feminine translation equivalent

Mixed NP (de- “of” + el “the”= <i>del</i> )	Translation Equivalent	Total	Gender & Canonical Type in Spanish
<i>del/el cloud</i>	<i>la nube</i>	3	<i>Feminine Non-canonical</i>
<i>del/el rock</i>	<i>la piedra</i>	2	<i>Feminine Canonical</i>
<i>del milk</i>	<i>la leche</i>	1	<i>Feminine Non-canonical</i>
<i>del key</i>	<i>la llave</i>	1	<i>Feminine Non-canonical</i>
<i>del window</i>	<i>la ventana</i>	1	<i>Feminine Canonical</i>
<b>TOTAL</b>		8	

In this task, only three participants produced mixed NPs containing nouns with feminine translation equivalents in Spanish. These three participants share certain characteristics: they are early bilinguals, who also reported having lived in a Spanish-speaking country (two in Mexico and one in Puerto Rico). In this task, one of the three participants produced only one congruent mixed NP, while the other two participants produced both congruent and incongruent mixed NPs. However, the three participants displayed a preference for congruent mixed NPs.

### 5.3 Results of Forced Toy Task

For the forced toy task, a total of 513 mixed NPs were produced by 31 of the 38 participants. The results of this task indicate that, overall, 292 mixed NPs were assigned masculine gender and 221 were assigned feminine gender. Of the 221 mixed NPs assigned feminine gender, a total of 115 mixed NPs were congruent and a total of 106 were incongruent. For the 292 mixed NPs assigned masculine gender, 271 were stimuli with masculine translation equivalents that were produced with a masculine determiner, and the remaining 21 constituted nouns with masculine translation equivalents combined with a Spanish feminine determiner (i.e., *la* or *una*). These results indicate that although the participants do not use one single strategy to assign gender, they preferred to use the gender of the translation equivalent when producing a mixed NP.

As shown in Table 9, all the nouns with feminine translation equivalents in Spanish that were used in this task were produced using the translation equivalent strategy. Nevertheless, the canonical *la ventana* ‘window’ was produced the most with this strategy, while non-canonical *la torre* ‘tower’ was produced the least.

**Table 9.** Mixed NPs produced using the analogical strategy during forced toy task (i.e., stimuli with Spanish feminine translation equivalents)

Mixed NPs Produced by Participants	Total	Canonical Type in Spanish	Spanish Translation
<i>la/una window</i>	24	Canonical	<i>la ventana</i>
<i>la/una table</i>	23	Canonical	<i>la mesa</i>
<i>la/una door</i>	23	Canonical	<i>la puerta</i>
<i>la/una cloud</i>	18	Non-canonical	<i>la nube</i>
<i>la/una nose</i>	16	Non-canonical	<i>la nariz</i>
<i>la/una tower</i>	11	Non-canonical	<i>la torre</i>
<b>TOTAL</b>	<b>115</b>		

106 mixed NPs were produced using a Spanish masculine determiner (i.e., *el* or *un*) with an English noun that has a feminine translation equivalent in Spanish (e.g., *la mesa* ‘table’). Table 10 shows that all stimuli with Spanish feminine translation equivalents used in this task were produced with a Spanish masculine determiner. However, the feminine non-canonical nouns *nube* ‘cloud,’ *nariz* ‘nose,’ and *torre* ‘tower’ were produced with a masculine determiner more frequently than the feminine canonical nouns *ventana* ‘window,’ *mesa* ‘table,’ and *puerta* ‘door’.

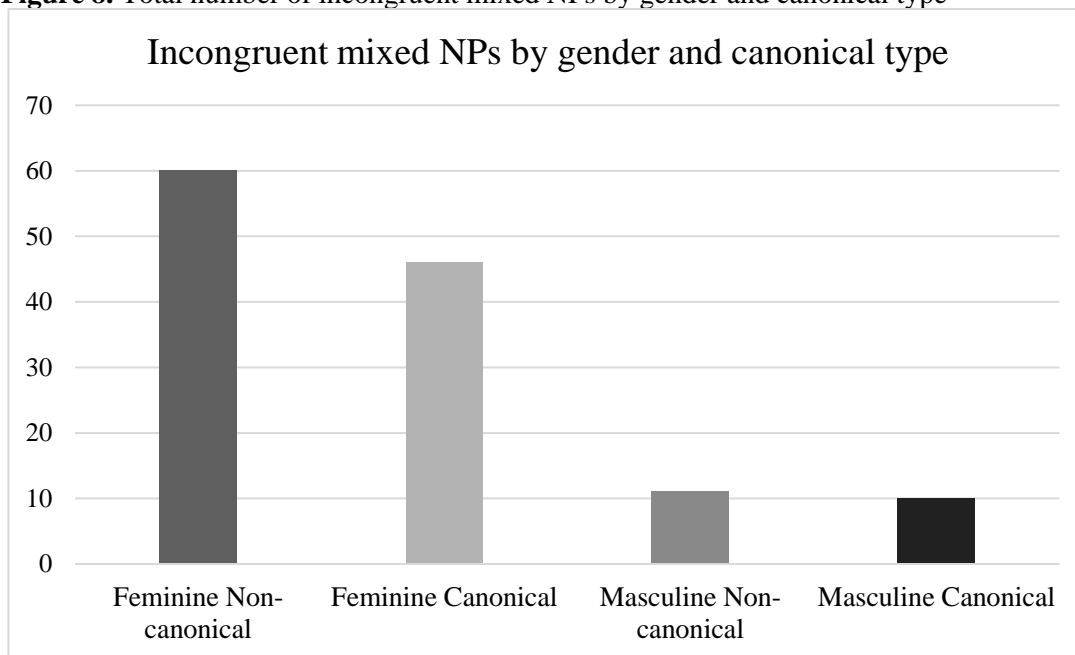
**Table 10.** Mixed NPs produced with a masculine determiner in the forced toy task (i.e., stimuli with Spanish feminine translation equivalents)

Mixed NPs Produced by Participants	Total	Canonical Type in Spanish	Spanish Translation
<i>al/del/el un cloud</i>	27	Non-canonical	<i>la nube</i>
<i>del/el/un nose</i>	23	Non-canonical	<i>la nariz</i>
<i>al/del/un window</i>	18	Canonical	<i>la ventana</i>
<i>del/el/un table</i>	15	Canonical	<i>la mesa</i>
<i>del/el/un door</i>	13	Canonical	<i>la puerta</i>
<i>del/el tower</i>	10	Non-canonical	<i>la torre</i>
<b>TOTAL</b>	<b>106</b>		

These results also indicate that there were more incongruent mixed NPs for feminine nouns (e.g., *el window* (cf. *la ventana*);  $n = 106$ ) than for masculine nouns (e.g., *la shoe* (cf. *el zapato*);  $n = 21$ ). As shown in Figure 8, there were also more incongruent mixed NPs produced for non-canonical nouns than canonical nouns, 56% vs 44%, respectively. However, more incongruent mixed NPs were produced for non-canonical feminine nouns (e.g., *el cloud*, cf. *la nube*) than non-canonical masculine nouns (e.g., *la heart*, cf. *el corazón*), 47% vs 9%, respectively. These results are similar to those of the natural toy task in that stimuli with feminine translation equivalents, regardless of canonical type, were more often incongruent than stimuli with masculine translation equivalents. Seventy of the mixed NPs produced using the translation equivalent strategy had translation equivalents with canonical endings, while the remaining 45 had non-canonical ending translation equivalents (61% vs. 39%,

respectively). These mixed NPs were produced by 26 participants who differed in bilingual profile.

**Figure 8.** Total number of incongruent mixed NPs by gender and canonical type



Further analysis of the feminine translation equivalents indicates that there is an even distribution of individual preferences between producing congruent and incongruent mixed NPs. Of the 28 participants who produced mixed NPs with feminine translation equivalent nouns, three participants show exclusive production of congruent mixed NPs, while three participants show exclusive production of incongruent mixed NPs. A total of five participants produced congruent and incongruent mixed NPs equally; eight participants showed a preference for congruent mixed NPs; and nine participants showed a preference for incongruent mixed NPs. This information is summarized in Table 11.

**Table 11.** Percentage and number of mixed NPs produced by participants (regarding only stimuli with Spanish feminine translation equivalents)

Participant Code	Bilingual Profile	Congruent Percentage	Incongruent Percentage	Total Mixed NPs (Feminine Nouns)
17	Early	100%	0	11
32	Late English	100%	0	12
36	Late English	100%	0	10
3	Early	84.6% (11/13)	15.4% (2/13)	13
24	Late Spanish	83.3% (5/6)	16.7% (1/6)	6
38	Late Spanish	80% (4/5)	20% (1/5)	5

8	<i>Late Spanish</i>	75% (3/4)	25% (1/4)	4
4	<i>Early</i>	62.5% (5/8)	37.5% (3/8)	8
28	<i>Early</i>	62.5% (5/8)	37.5% (3/8)	8
19	<i>Late Spanish</i>	60% (9/15)	40% (6/15)	15
26	<i>Early</i>	60% (6/10)	40% (4/10)	10
1	<i>Early</i>	50% (3/6)	50% (3/6)	6
2	<i>Late Spanish</i>	50% (1/2)	50% (1/2)	2
7	<i>Late Spanish</i>	50% (3/6)	50% (3/6)	6
20	<i>Early</i>	50% (1/2)	50% (1/2)	2
33	<i>Early</i>	50% (4/8)	50% (4/8)	8
9	<i>Early</i>	40% (2/5)	60% (3/5)	5
16	<i>Late English</i>	37.5% (3/8)	62.5% (5/8)	8
18	<i>Early</i>	34.6% (9/26)	65.4% (17/26)	26
12	<i>Late Spanish</i>	33.3% (1/3)	66.7% (2/3)	3
27	<i>Early</i>	33.3% (1/3)	66.7% (2/3)	3
25	<i>Late Spanish</i>	33.3% (3/9)	66.7% (6/9)	9
15	<i>Early</i>	12.5% (1/8)	87.5% (7/8)	8
11	<i>Early</i>	9.1% (1/11)	90.9% (10/11)	11
37	<i>Late Spanish</i>	7.7% (1/13)	92.3% (12/13)	13
10	<i>Early</i>	0	100%	2
34	<i>Early</i>	0	100%	1
35	<i>Early</i>	0	100%	6
<b>TOTAL</b>		52% (115/221)	48% (106/221)	221

Table 12 shows the gender assignment strategies used by the three groups of bilinguals who produced mixed NPs with feminine translation equivalents, that is, Early bilinguals (n= 16), Late English bilinguals (n= 3), and Late Spanish bilinguals (n= 9). Early bilinguals and Late Spanish bilinguals show a slight preference for producing incongruent mixed NPs (53.1% and 52.4%, respectively), while Late English bilinguals show a greater preference for congruent mixed NPs (83.3%).

**Table 12.** Congruency preference by bilingual type for forced toy task (Stimuli with Spanish feminine translation equivalents)

	<b>Early Bilinguals</b>	<b>Late English Bilinguals</b>	<b>Late Spanish Bilinguals</b>
<i>Congruency</i>	60 (46.9%)	25 (83.3%)	30 (47.6%)
<i>Incongruency</i>	68 (53.1%)	5 (16.7%)	33 (52.4%)
<b>TOTAL</b>	128	30	63

#### 5.4. Comparing the results

For the two toy tasks implemented in this study, fewer mixed NPs were produced in the natural task than in the forced task (i.e., 41 vs. 513), and fewer participants produced mixed NPs in the former than the latter (i.e., six vs. 31 participants). These differences can be explained by the nature of the two tasks. In the forced-switch task, participants were told to provide instructions in Spanish but name the object in English, while in the natural toy task, participants were free to choose the language in which to provide instructions. These differences suggest that in a natural context, mixed NPs are not produced as frequently (cf. findings from previous studies in Table 1 from naturalistic speech).

The Early bilingual group was the only group that produced mixed NPs with feminine translation equivalents in both toy tasks. However, this group showed a preference for congruent mixed NPs in both the forced-choice judgment task and the natural toy task, while showing a preference for incongruent mixed NPs in the forced-switch toy task. The Late English bilinguals showed a preference for congruent mixed NPs in the forced-choice judgment and the forced-switch toy tasks, while the Late Spanish bilinguals showed a preference for congruent mixed NPs in the judgment task but a preference for incongruent mixed NPs in the forced toy task. To recapitulate the overall results, Table 13 provides a summary of the congruency preference by each bilingual group for each task.

**Table 13.** Congruency preference per bilingual group per task

<b>Bilingual Group</b>	<b>Judgment</b>	<b>Natural</b>	<b>Forced-switch</b>
<i>Early Bilinguals</i>	<i>Congruent</i>	<i>Congruent</i>	<i>Incongruent</i>
<i>Late English</i>	<i>Congruent</i>	<i>N/A</i>	<i>Congruent</i>
<i>Late Spanish</i>	<i>Congruent</i>	<i>N/A</i>	<i>Incongruent</i>

## 6. Discussion

Regarding the first research question, namely which gender assignment strategy or strategies do New Mexican Spanish-English bilinguals use to assign gender to English nouns in Spanish-English mixed speech, the data from the judgment task and the natural toy task suggest that most participants show a preference for congruent mixed NPs. However, both Early bilinguals and Late Spanish bilinguals show a preference for incongruent mixed NPs in the forced-switch toy task, that is, producing a masculine



Spanish determiner with an English noun with a feminine translation equivalent, while Late English bilinguals show a preference for congruent mixed NPs in the same task.

Overall, the results in the present study, though following a similar pattern to previous studies regarding bilingualism profile, do not indicate a strong preference or support a clear gender assignment strategy for the New Mexican Spanish-English Early bilingual participants. We attribute these findings to the more diverse community of bilingual speakers interacting with other kinds of bilinguals as compared to previous research on CS in other communities of practice. This difference between participants' place of origin and diverse language interactions in multiple regions in the United States may account for the preference for congruent mixed NPs due to a more monolingual norm presence in rural communities. Note as well that CS utterances found in the corpora used in previous studies relate to speech from previous decades. The participants and the CS data collected in our study, however, were representative of a more diverse and contemporary sample.

Regarding the second research question (i.e., whether there is a difference in strategy assignment in terms of task type), for the comprehension, or judgment, task, 63.4% (n= 241) of the responses for stimuli with feminine translation equivalents were congruent. Early and Late English bilingual participants in our judgment task could have relied on cross-language transfer from Spanish (i.e., the gendered language in this study). For this reason, knowledge about feminine nouns in Spanish could have been applied to the selection of feminine determiners in mixed NPs. Previous research on acceptability judgment in Spanish-Basque mixed DPs revealed mixed results regarding the determining factor affecting gender assignment, namely, phonological ending and analogical gender (Parafita Couto et al. 2015; Iriondo 2017). Note that the diverse nature of findings in these studies could arise from several methodological differences, such as the participants' linguistic background (e.g., Licerias et al. 2008; Valdes Kroff 2016; Delgado 2017, all on Spanish-English bilinguals).

Furthermore, the type of task may have affected the way gender was assigned in mixed NPs with feminine translation equivalents. Previous studies on mixed NPs have reported an influence of the type of task used and the type of bilingual on the gender strategy adopted. As such, findings from Spanish-English adult bilinguals in areas in the United States similar to New Mexico have shown a preference for the masculine default option in spontaneous speech, irrespective of the gender of the translation equivalent of the English insertion in an otherwise Spanish utterance (see Table 1 above; see also similar findings in other areas of the United States in Jake et al. 2002, Otheguy & Lapidus 2003, and other language pairs using a toy task such as Spanish and P'urhepecha in Bellamy et al. 2018).

Moreover, the comparison between present findings and previous reports in similar areas in the United States is problematic due to the lack of multi-method tasks reported so far for New Mexico and neighboring CS communities of practice. Most previous research on NM and southern areas of the United States (see Table 1) used production naturalistic speech data collected from interviews (cf. Królikowska et al. 2019). The natural toy task is more aligned with data collected in previous studies, namely semi-experimental production task vs. (sociolinguistic) interviews. In this regard, previous studies that focused on naturalistic speech of mixed NPs in Spanish-English bilingual communities in New Mexico have demonstrated a preference for assigning masculine gender to mixed NPs (Trawick & Bero 2022; Aaron 2015; Clegg & Waltermire 2009), while the present study shows Early bilinguals preferred producing congruent mixed NPs with feminine translation equivalents in the natural

toy task (akin to the translation equivalent strategy). Indeed, this task elicited more naturalistic speech than the forced-switch toy task. However, since only three bilinguals code-switched in this task, the findings from this particular task are not sufficient to make a claim in terms of a clear strategy used as compared to previous reports. The results from the judgment task in the present study also cannot be compared to other similar communities of practice due to the lack of use of the task itself with similar bilingual profiles. The results from the production forced toy task in our study are comparable to those reported by Królikowska et.al. (2019) on bilingual speakers from Puerto Rico and El Paso, Texas. The data from El Paso matches, to a certain extent, the findings in our forced toy task for the use of both masculine and feminine determiners produced with nouns with feminine translation equivalents.

Lastly, bilingual profile (i.e., Early, Late English, and Late Spanish) may also be a conditioning factor regarding the use of a masculine or feminine determiner with English nouns with Spanish feminine translation equivalents. As demonstrated in Table 6, Late English bilinguals showed an exclusive preference for congruent mixed NPs in the judgment task, while only 70% of Early bilinguals and 50% of Late Spanish bilinguals showed a preference for congruency. These findings indicate that the participants who learned Spanish (i.e., the gendered language) first prefer the translation equivalent, aligning with previous findings. However, this preference was not observed in the forced-switch toy task for Early bilinguals and Late Spanish bilinguals, who showed a slight preference for incongruent mixed NPs in the forced toy task; Late English bilinguals' preferred gender assignment strategy remained the same in the forced-switch toy task (i.e., the translation equivalent). Nevertheless, in the natural toy task, only three Early bilinguals produced mixed NPs with feminine translation equivalents, demonstrating a preference for the translation equivalent strategy for this type of bilingual in a more naturalistic setting.

The results of this study indicate that not all Spanish-English bilinguals produce congruent and incongruent mixed NPs similarly. For example, in this study, only Early bilinguals produced mixed NPs with feminine translation equivalents in the natural toy task, while all bilingual types produced this type of mixed NP in the forced-switch toy task. However, in the forced-switch task, most participants who produced mixed NPs with feminine translation equivalents were Early bilinguals, while, in the natural toy task, there were only three participants, all Early bilinguals, who produced mixed NPs with feminine translation equivalents. In the natural task, just one of the participants produced 16 out of the total 21 mixed NPs with feminine translation equivalents; this participant also showed a preference for congruent mixed NPs in the forced toy task. For this reason, the limited number of cases of mixed NPs involving feminine nouns produced by only three participants in the natural toy task (see Tables 7 and 8) make the interpretation of the results inconclusive and difficult to compare with previous CS data from naturalistic speech from corpora interviews (see Trawick & Bero 2022; Aaron 2015; Clegg & Waltermire 2009).

In conclusion, the present study continues the existing body of literature on Spanish-English CS utterances in the nominal phrase by including data from different tasks and participants in a southern state in the U.S. The participants included in our study were habitual CSers in an urban setting and with diverse profiles of language contact and interaction with other languages and varieties of a given language. The inclusion of multiple tasks and a profile of bilingual speakers in an urban setting in New Mexico with more speakers interacting with other kinds of speakers (cf. Figures 3, 4 and 5 regarding social network and reported use of CS), advances previous

research and acknowledges the importance of the uniqueness of community practices that are constantly exposed to language change and variation. Further research is needed which includes additional data from participants outside university settings in similar urban settings in the state of New Mexico (i.e., non-college students, local community members in the Albuquerque and Santa Fe area, for instance). Additionally, it would be of exceptional value to create new corpora of naturalistic speech for Spanish and English in New Mexico, with data reflecting recent years of speech collection from both urban and rural settings.

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