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CHAPTER THREE

INTERVOCALIC /S/-VOICING IN SPANISH IN CONTACT WITH CATALAN

JUSTIN DAVIDSON[1]

Touted as a hallmark feature of Catalan-speakers' Spanish, the voicing of Spanish intervocalic alveolar /s/ (e.g. 'the friends' *los amigos* [lo.za.mí.ɣos]) has traditionally appeared in impressionistic, dialectological descriptions of the Spanish of Catalan-speaking territories. Whereas Wesch (1997) characterizes Barcelonan intervocalic /s/-voicing as a generally frequent phenomenon, albeit unlinked to any social stratification, Arnal (2011) has claimed that this feature is no longer present in the Spanish of the newest generation of Barcelonan bilinguals. Accordingly, in order to empirically assess the modern status of this phenomenon, the present investigation provides an exhaustive examination of select linguistic and social factors underpinning Barcelonan Spanish intervocalic /s/-voicing. Alongside a near-categorical absence of fully voiced Spanish [z] production in word-initial contexts (the site of a phonemic voicing contrast in Catalan), we argue that intervocalic /s/-voicing is a vital contact feature of Catalonian Spanish.

Key words: Catalan Spanish, voicing, Spanish dialects, sibilant voicing.

1. Introduction

Though the highly variable production of the Spanish voiceless alveolar fricative /s/ constitutes the most widely researched consonantal phenomenon in Hispanic Linguistics, the majority of

studies on Spanish /s/ focus on its aspiration or deletion (Chappell 2016), a trend appropriately echoed in this very volume on Spanish sibilants. Considerably fewer studies investigate the variable voiced or voiceless quality of /s/, and of those that do, the majority are limited to contexts of a following consonant, constituting treatments of variability in regressive voicing assimilation (see for example Campos-Astorkiza 2014, as well as Boomershine's chapter in this volume). The voicing of Spanish /s/ outside of the context of a following (voiced) consonant, or more precisely in syllable-initial or intervocalic contexts, is accordingly perhaps the least studied phenomenon pertaining to /s/ production, and constitutes the focus of the present chapter (though refer to File-Muriel's and Lipski's chapters in this volume for additional treatments).

Ascribed to first-language (L1) transfer from Catalan and considered a minority variant characteristic of the 'Catalanized' Spanish of Catalan-L1 bilinguals (Arnal 2011; Sinner 2002), the intervocalic voicing of /s/ to [z] (e.g. *los años* [lo.**s**á.ɲos] > [lo.**z**á.ɲos] 'the years') has most often been treated in impressionistic and/or dialectological work (e.g. Casanovas 1995; Hualde 2014; Payrató 1985; Serrano 1996; Vann 2001; Wesch 1997). In order to assess its modern vitality and use in Catalonian Spanish, especially given recent claims that phonetic features of Catalonian Spanish, such as intervocalic /s/-voicing, are no longer present in the Spanish of the newest generation of Barcelonan bilinguals (Arnal 2011), we adopt a framework of variationist sociolinguistics (Labov 2001; Tagliamonte 2012) and offer empirical evidence in support of intervocalic /s/-voicing as a regional marker of the Spanish of Catalonia.

This chapter is organized as follows: section 2 consists of a brief overview of linguistic history and language trends in Catalonia in order to better contextualize the sociolinguistic phenomenon in question. Section 3 offers an account of alveolar fricative production in Spanish and Catalan, detailing select prior findings that motivate the current study's research questions.

Section 4 describes the experimental methodology and test instruments. Section 5 discusses data analysis techniques and results from data collection. Section 6 offers a discussion of the results of the present study. Lastly, we conclude in section 7 by offering directions for future study.

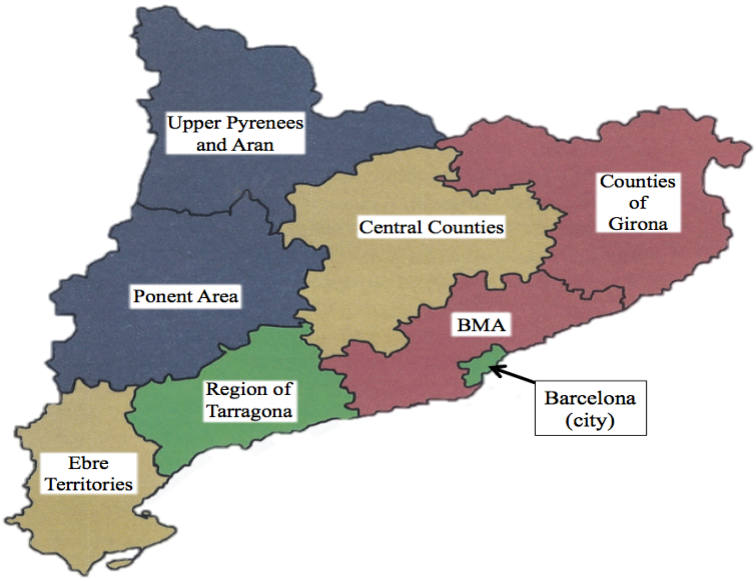
2. Spanish and Catalan in Catalonia

Though contact between Spanish and Catalan is centuries old, practical and widespread societal bilingualism is a relatively recent linguistic outcome in Catalonia's history. Until the formation of the Spanish Crown in 1469, a product of the union between the Arago-Catalan and Castile Kingdoms with the marriage of King Ferdinand II (Aragon) to Queen Isabella (Castile), Catalan was effectively the national and only language of Catalonia (Turell 2000; Vallverdú 1984). This alliance between the kingdoms marked the beginnings of Catalan-Spanish bilingualism in Catalonia, initially restricted to the ruling classes and noblemen, whereas the rest (and majority) of Catalonian society remained monolingual in Catalan. The status of Catalan as the national language of Catalonia was not definitively challenged until the Spanish War of Succession in the early 18th century, once Castilian King Phillip V signed the Ordinance of New Plant, a legislation that suppressed all institutions and privileges (e.g. media, administration, courts, etc.) of territories formerly part of the Arago-Catalan Kingdom (Àngel Pradilla 2001; Blas-Arroyo 2007; Vila-Pujol 2007). Bilingualism via the acquisition of Spanish by a Catalan-speaking populace began to extend from the upper classes down through the middle and lower classes, significantly propelled by the Moyano Law of 1857 that imposed compulsory public education taught in Spanish (Mas 1993; Vallverdú 1984; Vila-Pujol 2007). The ultimate rise of Spanish

hegemony over Catalan came with Spain's fascist dictatorship under General Francisco Franco from 1939 until his death in 1975, throughout which he actively passed legislation to eliminate - or completely Castilianize- all Catalan (and other non-Spanish) public institutions, as well as outlaw Catalan in the public sphere (Àngel Pradilla 2001; Arnal 2011; Newman 2008; Turell 2000; Vallverdú 1984; Vila-Pujol 2007). Three years after Franco's death, Spain's democratic period was inaugurated with the ratification of a new constitution that divided the country into quasi-federal Autonomous Communities (Newman 2008). The Spanish Constitution declares Spanish as the only official national language of Spain, and that all Spaniards have an obligation to know Spanish. Three additional languages of Spain, namely Catalan, Basque, and Galician, are permitted to be co-official alongside Spanish in the particular Autonomous Communities that choose to grant them co-official status (Vila-Pujol 2007: 68). Accordingly, Turell remarks that the Spanish Constitution reflects a conception of Spain in which Catalan, Basque, and Galician are in fact not a question of the State, consigning them as minority languages to asymmetric bilingualism in their respective Autonomous Communities (Turell 2000; Vila 2005; Newman 2008).

With respect to the modern usage of Catalan relative to Spanish in Catalonia, though the aforementioned asymmetric bilingualism unsurprisingly favors Spanish over Catalan, reported competences in Catalan are notably high. Approximately 94% of L1-Spanish speakers in Catalonia (ages 15+) report understanding Catalan and nearly 75% claim speaking competence, whereas the parallel figures for both Spanish competences by L1-Catalan speakers are approximately 100%. The disparity is more evident for immigrant populations in Catalonia for whom neither Spanish nor Catalan is a native language: whereas roughly 77% report understanding Catalan and 51% report speaking competence, the parallel figures for Spanish

competences are respectively 99% and 98% (*Institut d'Estadística* 2014). With regard to language use and the size of the Catalan-L1 population, the Barcelona Metropolitan Area (henceforth BMA, visualized in Map 1) stands as somewhat of an outlier in comparison to the Autonomous Community of Catalonia as a whole. Renowned for having the lowest presence of Catalan and fewest number of L1-Catalan speakers in all of Catalonia (Lleó 2008), approximately 23% of the current (2013) BMA population are L1-Catalan speakers, whereas approximately 64% are L1-Spanish speakers[2] (*Institut d'Estadística* 2014). Moreover, although there are currently over 600,000 (8% of total population of Catalonia [of 7,553,650]) non-native speakers of Catalan who use Catalan as their habitual language in Catalonia, (i.e., native speakers of either Spanish or another language who learned Catalan as a second language), the BMA continues to rank the lowest in all of Catalonia for the number of speakers habitually using Catalan, at approximately 28% of its population, as compared to 60% for habitual Spanish use (Generalitat 2014; *Institut d'Estadística* 2014). A fuller comparison of native and habitual language patterns between the BMA and Catalonia appears in Table 1, in addition to the calculations for Catalonia excluding the BMA, which crucially indicate that were it not for the BMA, Catalan in fact would constitute the majority language in this Autonomous Community.



Map 1. Regional territories of Catalonia (adapted from Generalitat 2009, 2011)

Table 1. 2013 population (%) ages 15+ with Catalan and Spanish as native or habitual language (*Institut d'Estadística* 2014)

		Barcelona Metropolitan Area	Catalonia	Catalonia Excluding BMA
Native Language	Catalan	23.3	31	44.5
	Spanish	64.3	55.1	39.16
Habitual Language	Catalan	27.8	36.3	51.21
	Spanish	60	50.7	34.52

The predominance of Spanish in the BMA (and the city of Barcelona in particular)[3] comes as a direct result of immigration trends consistent since the mid-20th century, led by L1-Spanish speakers both from other territories of Spain and more recently in the 21st century from Latin America. Approximately 21% of the BMA population is comprised by L1-Spanish immigrants from Spain, which is roughly 10 times as many as found in the region with the next to highest

population of Spanish immigrants, Tarragona. Still, despite this territorial pocket of Spanish predominance, the aforementioned Catalan competence census data show that Catalonian society is characterized by a widespread and high degree of Catalan-Spanish bilingualism, which has come about only gradually since the end of the Franco dictatorship with sweeping educational and governmental reforms to revitalize Catalan.

Notably, it has been claimed (see for example Vila-Pujol 2007) that Catalan holds more political power and social prestige than Spanish in Catalonia:

> The social stratification of the two languages in Catalonia is unique because 'even if Spanish is, in principle, the stronger language, from certain perspectives it is also the less prestigious' [Siguan 1988: 454]. This could be so because Catalan 'is the language of a large part of the economic and intellectual middle class, as well as the language of local political power,' [Siguan 1988: 454] while Spanish is the language of the immigrants and the lower social strata (Sinner 2002: 161).

Thus, though Catalan is a stateless language insomuch as the lack of official status throughout the country as a whole, it nonetheless has a very high degree of use and linguistic capital (or afforded prestige and power) throughout Catalonia, giving it arguably more administrative power than Spanish.

3. Prior treatments of (intervocalic) fricative production

3.1 *Prescriptive characterizations of alveolar fricative production in Spanish and Catalan*

Northern-Central Peninsular Spanish features an apical-alveolar voiceless /s/, articulated with a gesture of the tongue-tip toward the alveolar ridge (Dalbor 1997; Hualde 2014; Martínez 2007; Quilis 1981). In monolingual Spanish varieties that do not exhibit aspiration or deletion of /s/ in pre-consonantal positions, such as Mexican Spanish and North-Central Peninsular Spanish, two allophones of /s/, namely voiceless [s] and voiced [z], are found in complimentary distribution via regressive assimilation of voicing to the following consonantal segment. Before voiced (semi)consonants, /s/ is realized as [z] (e.g. *rasgo* [ráz.ɣo] 'feature'; *mis hierbas* [miz.ʝéɾ.βas] 'my herbs'), whereas in all other contexts, /s/ is produced as [s] (e.g. *rasco* [ráz.ko] 'I scratch'; *casa* [ká.sa] 'house'; *patos* [pá.t̪os] 'ducks') (Azevedo 1992; Dalbor 1997; Hualde 2014, 2010; Navarro Tomás 1918; Morgan 2010; Pieras 1999; Schwegler 2010; Teschner 1996). Accordingly, monolingual Spanish productions of [z] outside of the context of a following voiced (semi)consonant (e.g. the intervocalic context in particular) are prescriptively disallowed:

> La *s* sonora aparece únicamente, en nuestra lengua, en posición final de sílaba, precediendo inmediatamente a otra consonante sonora; en cualquier otra posición su presencia es anormal y esporádica. [The voiced /s/ in our language appears solely in syllable-final position immediately preceding another voiced consonant; in any other position its presence is abnormal and sporadic] (Navarro Tomás 1918: 83).

In contrast to Spanish, Central Catalan features two apical-alveolar fricative phonemes, voiceless /s/ and voiced /z/. This phonemic voicing contrast is active word-initially and word-medially,

producing minimal pairs such as *zel* ‘zeal’ [zɛ́ɬ] (Spanish *celo* [θé.lo]) / *cel* ‘sky’ [sɛ́ɬ] (Spanish *cielo* [θjé.lo]) and *pesar* ‘to weigh’ [pə.zá] (Spanish *pesar* [pe.sáɾ]) / *passar* ‘to pass’ [pə.sá] (Spanish *pasar* [pa.sáɾ]). Critically, this phonemic voicing contrast is neutralized word-finally, resulting in [s] or [z] depending on the voicing feature of the following segment (that is, the voicing neutralization of word-final Catalan alveolar fricatives [and in fact all Catalan sibilants] resolves by means of anticipatory assimilation). When followed by a voiced segment, such as a vowel, the word-final fricative is systematically voiced (e.g. *gos* [s] ‘dog’; *gos estrany* [z] ‘strange dog’) (Hualde 1992, 2014; Julià 2008; Pieras 1999; Prieto 2004; Recasens 2014; Wheeler 2005).

In summary, voiced intervocalic fricatives are systematically present in Catalan, resultant from word-initial /z/, word-medial /z/, and as a product of voicing assimilation of word-final prevocalic /s/ and /z/ [or archiphoneme /S/]). This accordingly sets up an interesting pair of opportunities for bidirectional contact influence (i.e., L1-transfer) contingent on syllable position. With respect to syllable-initial contexts, productions of Spanish *pesar* ‘to weigh’ or *casa* ‘house’ as [pe.záɾ] and [ká.za] on the part of an L1-Catalan speaker could evidence the transfer of a Catalan phoneme (/z/) into Spanish, whereas productions of Catalan *pesar* ‘to weigh’ or *casa* ‘house’ as [pə.sá] and [ká.sə] on the part of an L1-Spansh speaker could evidence the substitution of Spanish /s/ for Catalan /z/, potentially eliminating the phonemic voicing contrast in Catalan. With respect to word-final contexts, the production of Spanish *las albas* ‘the dawns’ as [la.zál.βas] by an L1-Catalan speaker, or the production of Catalan *les albes* ‘the dawns’ as [lə.sál.βəs] by an L1-Spanish speaker, would constitute a case of largely phonetic, rather than phonemic, transfer (i.e., the respective transfer of a Catalan or Spanish phonotactic voicing rule, which wouldn’t create nor eliminate any phonological contrasts).

3.2 *Empirical characterizations of alveolar fricative production*

The aforementioned prescriptive characterizations of Spanish and Catalan alveolar fricative production as absolute (i.e., Spanish [s] and [z] allophony as perfectly categorical, and Catalan /s/, /z/, and /S/ production as non-variable) are plainly refuted by recent empirical phonetic research, which demonstrates wide degrees of variability in voicing and non-voicing in both languages. Focusing on Spanish (for Catalan, see Ballart 2013; Benet 2012; Bonet 1998), instances of [s], partially voiced [s̬], and [z] were all found to occur, in varying frequency, in each of the contexts of a following vowel, a following voiceless consonant, and a following voiced consonant in Northern-Central Peninsular Spanish (cf. Campos-Astorkiza 2014), Mexico City Spanish (Schmidt 2011), Highland Colombian Spanish (García 2013), Quito Spanish (Strycharczuk 2014), and in the speech of a group of (presumably monolingual or Spanish-dominant) speakers from Madrid, Valencia, and Galicia (Clegg 1992). Although Clegg declares "there is no question as to the existence of the phenomena of sporadic voicing of /s/ in all positions and extensive voicing in some speech communities" (1992: 32), the aforementioned studies attesting to a lack of voicing before voiced consonants in several Spanish varieties merits a broader generalization, namely that /s/-voicing assimilation is highly variable, as well as gradient.

The treatment of /s/-voicing as a gradient phenomenon is supported by cross-linguistic research evidencing the gradiently voiced or voiceless quality of alveolar fricatives, prepalatal fricatives, the fricative portion of prepalatal affricates, as well as other /s/ lenition phenomena (e.g. aspiration, elision), in Portuguese (Jesus 2003), English (Smith 1997; Stevens 1992),

Catalan (Carrera-Sabaté 2009), Italian and Dutch (Rivas 2006), and several varieties of Spanish including Caleño Spanish (File-Muriel 2011), Argentinean Spanish (Gradoville 2011; Rohena-Madrazo 2015), Madrid Spanish (Torreira 2012), Castilian Spanish (Romero 1999), and New York City Spanish (Erker 2012). In this line of research, fricative voicing assimilation is modeled within gestural phonology (Browman 1989; 1991) as a product of the relative timing and coordination of opposing (or conflicting) laryngeal gestures necessary to restrict or permit voicing during the fricative segment in conjunction with adjacent segments. In particular, the conflicting laryngeal gestures for [s] (vocal fold abduction) and a following voiced consonant (vocal fold adduction) can give rise to gestural blending (Browman 1989, 1991), resulting in a single vocal fold adduction gesture that extends fully into the /s/ segment, yielding [z] (Campos-Astorkiza 2014; Hualde 2014; Romero 1999). Fricative voicing before a voiced (semi)consonant or vowel can therefore be understood as a lenition phenomenon, in that the conflicting glottal gestures for [s] and the following voiced segment are gradiently reduced to a single glottal gesture that maintains voicing throughout.

3.3 *Intervocalic /s/-voicing in Barcelonan Spanish*

Prior treatments of phonetic features of Barcelonan Spanish often discuss intervocalic [z] as a product of Catalan-Spanish transfer that characterizes a Catalanized variety of Spanish of Catalan-dominant speakers. For example, impressionistic interviews by Sinner (2002) suggest that [z] is a possible linguistic marker (Labov 2001) of Catalonian Spanish. Having interviewed 12 speakers of Barcelonan Spanish and monolingual (Madrid) Spanish ages 27-41 regarding their awareness of linguistic features of Catalanized Spanish, intervocalic [z] was only named by

select Barcelona speakers, who additionally discussed feeling an "obligation to correct or adjust their [Spanish] pronunciation when talking in public" (Sinner 2002: 163). More recently, a matched guise experiment was conducted by Davidson (2019) in order to empirically confirm Barcelonans' social evaluation of intervocalic [z] vs. [s]. Findings revealed that Spanish intervocalic [z] is positively associated by Barcelonan bilinguals with higher solidarity and a Catalan-Spanish bilingual identity, though these associations were exclusively covert, as listeners were unable to explicitly identify the phonetic difference between guises with [z] vs. [s].

Wesch (1997) examined possible effects of age and social class on intervocalic [z] production in Barcelona Spanish. The variant was impressionistically characterized as frequent, while unlinked to age and social class. Parallel results describing intervocalic [z] production as frequent and unlinked to social factors (gender, age, social class) have been found for the Spanish spoken in Palma de Mallorca and Sóller, Balearic Islands (Pieras 1999; Serrano 1996).

Davidson (2015) empirically assessed the frequency of intervocalic [z] in the careful speech (i.e., word-list reading) of 20 Barcelonan female youths (ages 18-27) stratified by language dominance, and explored linguistic factors that conditioned the production of intervocalic /s/. While [z] production was most strongly favored by speakers with the greatest exposure to and usage of Catalan (32% [z] production), speakers with greater exposure to and use of Spanish nonetheless used [z] over 25% of the time. Both groups additionally produced intervocalic [z] significantly more often in the word-final prevocalic context than the syllable-initial context (by roughly 40%), whereas a significant effect of syllable stress favoring [z] across unstressed intervocalic /s/ sequences over stressed ones was only obtained for speakers with the greater exposure to and use of Catalan.

To synthesize, as the majority of research on intervocalic /s/-voicing in Catalonian Spanish consists of impressionistic characterizations of [z] as a frequent, hallmark feature of Catalan speakers' Spanish (Casanovas 1995), an exhaustive account of its modern usage has yet to be obtained. Social correlates of Barcelonan [z] production are characterized as absent by Wesch (1997), and though Davidson (2015) found that frequencies of [z] production were sensitive to speakers' exposure to and usage of Catalan, additional sensitivities to speaker gender, age, and speech style, three of the foundational social factors that inform variationist sociolinguistic evaluations of language variation and possible change (Labov 2001; Tagliamonte 2012), were unexamined. Overt awareness of Barcelonan Spanish [z] appears relatively absent, and positive links with solidarity and a shared bilingual identity may facilitate the diffusion of this feature throughout the bilingual speech community (Sinner 2002), though such a hypothesis must be treated as speculative until an empirical investigation of the social and linguistic correlates of intervocalic /s/-voicing is performed.

As the only empirical quantification of Barcelonan intervocalic /s/-voicing consists of Davidson's (2015) examination of young females' careful speech, it is difficult to assess the extent to which [z] is present relative to [s] in Barcelona, particularly in more natural, spontaneous speech. Arnal (2011) has claimed (crucially, impressionistically) that due to the aforementioned massive influx of L1-Spanish speakers to Barcelona since the mid-20th century, the speech of the current youth generation no longer exhibits Catalanized features, and in particular phonetic innovations that would comprise a Catalanized accent of Spanish. While Davidson's (2015) findings of [z] production at rates above 25% appear inconsistent with this claim, the present study offers a considerably more exhaustive examination of intervocalic /s/-voicing as conditioned by a full array of linguistic and social factors, and will definitively

demonstrate the degree to which this feature persists in Barcelonan Spanish, and indeed is actively being further propagated throughout the speech community as a regional marker of Catalonian, bilingual Spanish.

4. Experimental methodology

4.1 *Social factors and subject population*

Four social factors, namely gender, style, age, and language dominance, were employed in the present research on Spanish intervocalic /s/-voicing. Following the Variationist Sociolinguistic framework (Labov 2001; Tagliamonte 2012), gender, style, and age stratification reveal important insights into the current status and trajectory of [z] production in Barcelonan Spanish. With respect to gender and style, females are expected to conform more closely than men to overtly prescribed linguistic norms but conform less than men when they are not overtly prescribed (Chambers 2004; Labov 2001) a pattern commonly termed the gender paradox. Given the lack of overt awareness of non-standard [z], coupled with its positive covert link to solidarity and bilingual identity, we accordingly may expect a gender stratification favored greater voicing by females over males, as well as greater voicing when speakers speak more spontaneously than when they more closely monitor their speech while reading. As for age, we employ the apparent-time construct (Bailey 2004, 1991; Chambers 2004; Sankoff 2007; Tagliamonte 2012) by establishing two age groups approximately one generation apart (18-30 year olds vs. 48-60 year olds) and interpret synchronic variation as indicative of a diachronic trajectory whereby the

younger group is considered more advanced than the older group. With regard to the last social factor, language dominance, participants were recruited in two principal testing sites, namely Barcelona and Madrid, mirroring Sinner (2002).[4] The former was divided into three groups based on profiles of language dominance and a city/village divide, whereas the latter served as a smaller control group that permitted a comparison of intervocalic /s/ production of the Catalan-Spanish community with those of an outsider, monolingual Spanish community. Bilingual participants were classified into speaker groups based on reported usage of Catalan and Spanish in their daily lives and familial upbringing, though as previously discussed in section 2, all bilingual participants displayed a functional command of both languages. Barcelona participants all hail from the Barcelona Metropolitan Area (BMA), though those from the urban capital (population = 1,573,318 [*Institut d'Estadística* 2011)] are grouped separately from those from smaller, Catalan-prevalent villages (average population = 7,419 [*Institut d'Estadística* 2011]) on the outskirts of the BMA, capturing potential differences in intervocalic /s/ production reflecting an urban/rural divide as previously obtained in Sinner (2002) and Davidson (2019). A total of 54 speakers participated, visualized in Table 2.

Table 2. Subject population according to language profile group (2013 Census data: *Institut d'Estadística* 2014)

Listener Group	**Younger (18-30) / Older (48-60)**	**Home Language / Native Language / Parent Native Lang.**	**Daily Spanish Use**	**2013 Linguistic Census Data for Catalan Competencies (understand / speak / read / write)**
A – Catalan-dominant, village	5M 5F / 3M 3F	Catalan	7% (SD = 5.8)	98% / 88% / 88% / 70%
B – Catalan-dominant, city	5M 5F / 3M 3F	Catalan	10% (SD = 6.9)	95% / 72% / 79% / 53%

C – Spanish-dominant, City	5M 5F / 3M 3F	Spanish	77% (SD = 10.8)	
D – Madrid (monolingual)	3M 3F	Spanish	100% (SD = 0)	N/A

4.2 *Linguistic factors*

The present investigation incorporates two linguistic factors, namely word position and stress, as motivated by prior empirical research by Davidson (2015) and Pieras (1999), as well as by descriptions reported in Serrano (1996), Vann (2001), and Wesch (1997). These factors are word position, stress, and word class. First, with respect to word position, Vann (2001), Wesch (1997), and Vázquez (1996) only list examples of [z] production in word-final intervocalic position, not mentioning word-initial and word-medial intervocalic contexts. Davidson (2015) found a strong effect of word position, such that intervocalic fricative voicing in word-medial contexts was heavily disfavored over word-final prevocalic contexts. In the present study, we slightly modify the treatment of word position, namely by differentiating between intervocalic /s/ segments in word-final position (e.g. *las amigas* 'the friends') and in word-initial position (e.g. *estaba salado* 'it was salty'). The decision to substitute the word-initial intervocalic context for the word-medial context was made in order to facilitate the full crossing of linguistic factors, since vowels surrounding word-medial /s/ are typically oppositely stressed (e.g. *masa* /má.sa/ 'mass,' *pasado* /pa.sá.do/ 'past').

Moreover, it should be noted that significant differences in the (small) degree of intervocalic fricative voicing conditioned across word-initial and word-medial intervocalic contexts were not

obtained for Madrid Spanish (Torreira 2012). In accordance with the aforementioned research, we hypothesize that intervocalic /s/-voicing will be favored in the word-final context over the word-initial context, especially in so much as the word-initial context is uniquely the site of a phonological voicing contrast in Catalan (as previously discussed in section 3.1.). Additionally, it should be noted that the favoring of greater voicing, and indeed other analogous lenition phenomena like /s/-aspiration in word-final contexts over word-initial ones, has been accounted for in non-contact varieties of Spanish as a general consequence of coda contexts being a prosodically weaker position, thus favoring segmental weakening (File-Muriel 2010; Nam 2009; Torreira 2012).

Second, with regard to stress, Davidson found that intervocalic /s/-voicing was favored in contexts of surrounding unstressed vowels for select Barcelonan female youths (2015: 13). In the present study, we have opted to simplify the treatment of syllable stress (which previously was investigated as two separate variables, namely prior vowel stress and proceeding vowel stress) in order to facilitate a fuller crossing of linguistic factors. We shall consider stress effects on /s/ production in terms of two contexts: surrounding unstressed vowels (e.g. *las amigas* 'the friends,' *carta sin nombre* 'letter without a name') and at least one (two whenever possible) stressed vowels (e.g. *las águilas* 'the eagles,' *está sin dinero* 's/he is without money,' *serás ágil* 'you will be agile'). Since Spanish has no determiners ending in /s/ that exhibit final-syllable stress, these tokens, alongside (unstressed) prepositions (e.g. *sin* 'without,' *sobre* 'on,' *tras* 'after'), are the only tokens belonging to the "stressed" group that feature a single adjacent stressed vowel as opposed to two.

The conditioning of stress, on a theoretical ground, invokes the concept of local hyper-articulation for stressed syllables, or the notion that the speaker may reduce otherwise expected

effects of gestural overlap with a neighboring segment across stressed syllables, since these kinds of syllables have longer durations in Spanish (Hualde 2014) and allow the speaker to better time articulatory gestures independently of one another (cf. Browman 1989, 1991). More concretely, this would suggest that tokens with stressed surrounding vowels, such as *serás ágil*, would be the most resistant to /s/-voicing as an effect of the greater opportunity (across stressed syllables) for the successful coordination of vocal fold abduction for voiceless [s] relative to the vocal fold adduction gestures of the surrounding (voiced) vowel segments.

4.3 *Test instruments*

Three test instruments were utilized in this study. The first, a socio-demographic questionnaire, was used to screen participants according to the social criteria outlined in section 4.1 so as to facilitate their binning according to the language profile groups that appear in Table 2.

The second instrument, a recorded phrase reading in Spanish (see the Appendix for all stimuli), was used to elicit more self-monitored or careful speech. Subjects were asked to read aloud, using their best pronunciation, a series of 80 target phrases with intervocalic /s/, stratified according to the aforementioned two linguistic factors of word position and stress (20 tokens per cell). With the exception of target items with the unstressed prepositions *sin* 'without' and *sobre* 'on,' all intervocalic /s/ stimuli consisted of a sequence of /a/ - /s/ - /a/. The motivation to minimally vary the quality of vowel surrounding /s/ tokens stems from a related /s/-lenition study by File-Muriel (2011) that found a significant effect of surrounding vowel height on the lenition of /s/ to [h] and [Ø]. The selection of /a/ as the vowel to most often surround /s/ follows Quilis,

who notes that of all the Spanish vowels, /a/ is the one that exerts the least influence on the frequency of the energy produced during an /s/ segment (1981: 235).

The third instrument, a 20-minute sociolinguistic interview (Labov 2001), was used to elicit more casual, spontaneous speech. Participants were asked to discuss casual topics such as food preferences, hobbies, and vacation spots, with the goal of eliciting as much casual speech data as possible from each participant. The inclusion of this task alongside the aforementioned phrase reading permits an analysis of speech style of intervocalic /s/ production, notably with the expectation that non-standard speech variants, like intervocalic [z], are more likely to be avoided in more formal speech styles (Moreno 2009; Tagliamonte 2012).

4.4 *Data collection methods*

Each participant was recorded individually during a single experimental session lasting approximately 45 minutes. Participants were recorded using an SE50 Samson head-mounted condenser microphone and an H4n Zoom digital recorder (sampling at 44,100hz) in an audiometric booth in the phonetics laboratory at the *Universitat Autònoma de Barcelona*, in an empty classroom at the *Universitat de Barcelona* or *Universitat Pompeu Fabra*, or (for monolinguals) in a quiet room in the *Centro de Estudios de Posgrado* at the *Universidad Autónoma de Madrid*. Recruitment was accomplished principally through the use of posted flyers that advertised the study and its compensation for completion of 15 euros.

5. Data analysis and results

5.1 *Acoustic analysis*

Several methods of analyzing (de)voicing phenomena in fricatives can be found in the phonetics and phonology literature, including the percentage of the fricative segment's duration that is voiced (which relates to spectral properties of the segment and can be computed manually or by using Praat's voice report function, which uses a pulse-based algorithm), harmonicity, intensity, and center of gravity (all of which relate to the segment's energy properties), and duration (which relates to temporal properties of the segment). Gradoville (2011) offers a brief explanation of the theory behind each measurement and sources in the literature for each. As Gradoville addresses, few attempts to weigh or compare the validity of a particular measurement type against another have ever been made, and thus his research aims to objectively determine which method(s) is/are most valid for the study of fricative (de)voicing phenomena. We have chosen to measure intervocalic /s/-voicing in terms of the percentage of each segment's voiced duration, which, aside from being corroborated by Gradoville as a valid measure of fricative voicing, has been used to examine /s/-voicing assimilation in Mexican Spanish (Schmidt 2011), Madrid Spanish (Hualde 2014; Torreira 2012), U.S. Spanish (chapter 6 of this volume), Costa Rican Spanish (Chappell 2017), Colombian Spanish (chapter 8 of this volume), and North-Central Peninsular Spanish (Campos-Astorkiza 2014), facilitating more transparent comparisons of the present Barcelonan Spanish data with these distinct varieties.

In order to calculate voicing durations for each intervocalic fricative segment, fricative boundary segmentation was performed manually by marking left and right boundaries for each segment by using both the waveform and spectrogram to find the zero-intercept in the waveform

closest to the first and last signs of aperiodic noise (Campos-Astorkiza 2014; Erker 2012; File-Muriel 2011; Rohena-Madrazo 2015; Schmidt 2011). Once intervocalic fricative segments were segmented, exact voicing durations were measured as portions of each fricative segment that exhibited a fundamental frequency (that is, a pitch track), a voice bar at the bottom of the spectrogram, and glottal pulses (Campos-Astorkiza 2014; Gradoville 2011; Hualde 2014; Rohena-Madrazo 2015; Schmidt 2011; Torreira 2012).

Note that voicing duration measurements were calculated only after adjusting the Praat spectrogram viewing window to be exactly twice the size of the /s/ segment and centered on the /s/ segment, as the F0 contour in the spectrogram is calculated with respect to the segments in the visible window. Example spectrograms illustrating a less voiced and more voiced realization of Spanish intervocalic /s/ produced by different speakers appear as Figures 2 and 3.

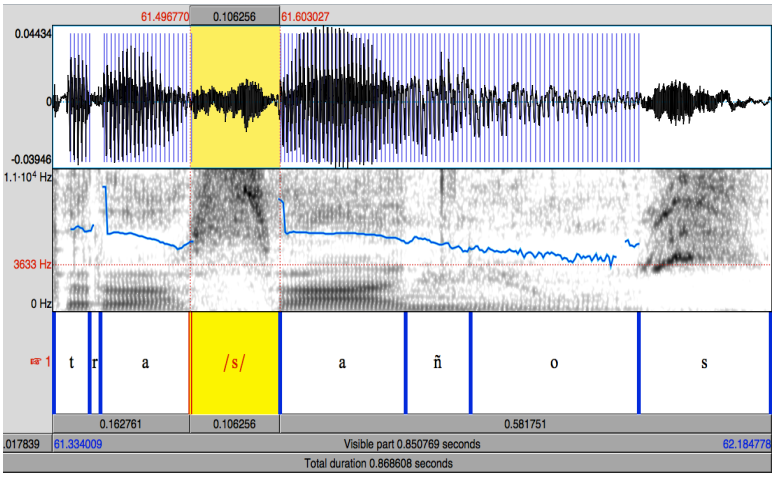


Figure 2. Group C, younger female rendition of *tras años* 'after years' (5% voiced)

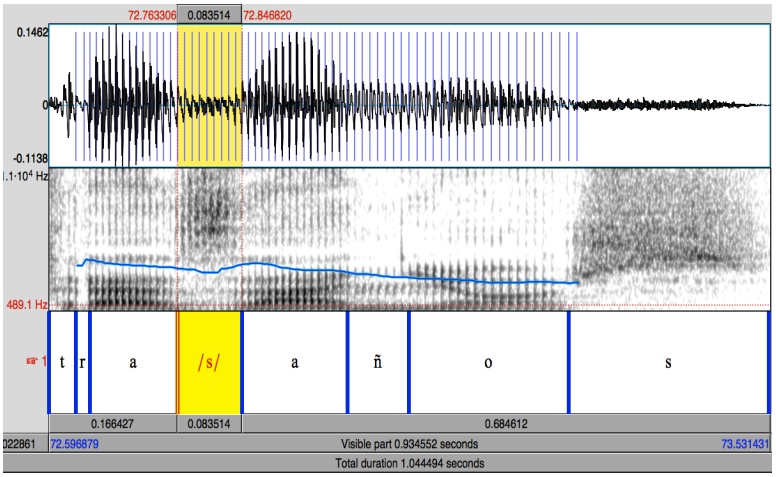


Figure 3. Group A, younger male rendition of *tras años* 'after years' (100% voiced)

The phrase reading task yielded a total of 4,320 Spanish /s/ tokens. Those (relatively few) tokens with notable speaker disfluencies (principally pauses disrupting the word-final /asa/ sequence in items like *explorarás áreas* 'you will explore areas') were discarded from analysis, leaving 4136 Spanish /s/ tokens (roughly 77 out of a possible 80 tokens per speaker) for subsequent statistical analysis. Regarding the casual Spanish /s/ data from the sociolinguistic interview, each participant contributed a total of precisely 20 casual Spanish /s/ tokens, perfectly balanced across the factors of word position and stress, as this was the highest number of intervocalic /s/ tokens produced by all speakers that offered the most parallel distribution of linguistic factor contexts as compared with the /s/ tokens elicited from the careful speech task, permitting a more valid comparison of /s/ production across the two speech styles. With the addition of these 1,080 casual Spanish intervocalic /s/ tokens, the total amount of Spanish /s/ tokens available for statistical analysis was 5,216, which equates to roughly 97 tokens per speaker.

5.2 *Statistical analysis*

A single mixed-effects linear regression model was performed in R using the percentage of voiced segment duration as the dependent variable, testing for fixed effects of two linguistic factors (word position [initial vs. final] and stress [stressed vs. unstressed]) and three social factors (gender [male vs. female], style [careful vs. casual], and the combination of language profile group with age, since the control group of Madrid monolinguals was not stratified with respect to age [Group A, Younger vs. Group B, Younger vs. Group C, Younger vs. Group A, Older vs. Group B, Older vs. Group C, Older vs. Group D, Younger]). Interaction terms between the combined language profile group and age factor and each of all the other independent variables were included in order to assess whether or not any of the effects varied significantly according to the combined language profile and age groups. Individual speaker and token were included as random effects in the model.

The results of the linear mixed-effects regression appear in Table 3 (note that positive β coefficients indicate greater voicing degrees compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of combined language profile and age group ($F[6,42.72] = 19.98$, $p<.0001$), gender ($F[1,40] = 26.29$, $p<.0001$), style ($F[1,97.71] = 35.93$, $p<.0001$), word position ($F[1,2385.85] = 1248.74$, $p<.0001$), and stress ($F[1,2449.89] = 189.38$, $p<.0001$). Additionally, two significant interaction effects were found, namely between the combined language profile and age group and each of gender ($F[6,5046.2] = 2.8$, $p=.01$) and word position ($F[6,5045.82] = 137.62$, $p<.0001$). Given the complex nature of this model, we shall elaborate on each of these findings separately, offering additional information (and post-hoc analyses) as necessary for each finding.

Table 3. Summary of mixed-effects linear regression model fitted to Barcelonan and Madrid Spanish intervocalic alveolar fricatives. Intercept: Group A, younger female casual speech, word-final unstressed tokens

	β	*t*	*p*
(Intercept)	95.79	20.70	<.0001
Group A, Older	-27.2	-4.46	<.0001
Group B, Older	-18.66	-3.06	0.0034
Group C, Older	-47.99	-7.86	<.0001
Group C, Younger	-21.69	-4.1	0.0001
Group D (Younger)	-60.56	-9.92	<.0001
Male	-10.71	-3.82	0.0003
Careful	-15.28	-4.6	<.0001
Word-initial	-65.09	-41.72	<.0001
Stressed	-12.4	-7.97	<.0001
Group D (Younger): Male	9.88	2.95	0.002
Group A, Older: Word-initial	28.72	14.4	<.0001
Group B, Older: Word-initial	29.45	14.67	<.0001
Group C, Older: Word-initial	38.79	19.23	<.0001
Group B, Younger: Word-initial	8.98	5.18	<.0001
Group C, Younger: Word-initial	30.01	17.21	<.0001
Group D (Younger): Word initial	44.56	22.26	<.0001

5.2.1 *Social factors conditioning intervocalic /s/-voicing*

With respect to the main effect of the combined language profile and age groups, Tukey post-hoc analyses were used to tease apart the separate contributions of age and language profile on intervocalic /s/ production. Regarding age, each bilingual profile group exhibited a parallel and statistically significant stratification of age favoring greater voicing degrees by younger speakers

(for Group A, p=.004; for Group B, p=.02; for Group C, p=.04), consistent with an analysis of possible change in progress toward greater voicing degrees in apparent time.

Regarding language profile group, a parallel and statistically significant stratification by usage and exposure to Catalan was obtained for each age group: whereas Group A and Group B voicing degrees were not statistically distinct from one another (for younger speakers, p=.99; for older speakers, p=.99), both displayed significantly greater voicing degrees than Group C speakers (for younger A speakers, p=.0003; for older A speakers, p=.03; for younger B speakers, p=.002; for older B speakers, p=.0224), indicative of the influence of Catalan on intervocalic /s/-voicing in Barcelonan Spanish.

As for comparisons between voicing degrees for bilingual Barcelonan speakers and monolingual Madrid speakers, with the exception of older Group C speakers (p=.9536), all bilinguals used significantly greater voicing degrees than the monolinguals (for younger A speakers, p<.0001; for older A speakers, p=.005; for younger B speakers, p<.0001; for older B speakers, p=.0013; for younger C speakers, p=.0022). This confirms that the voicing degrees present in modern Barcelonan Spanish are truly distinct (greater in degree) from monolingual Spanish, especially in that even the more Spanish-dominant (Group C) younger bilinguals use intervocalic /s/-voicing more strongly than their Madrid monolingual peers. Figure 4 offers a visualization of this relationship between Spanish intervocalic /s/-voicing and each of language profile group and age.

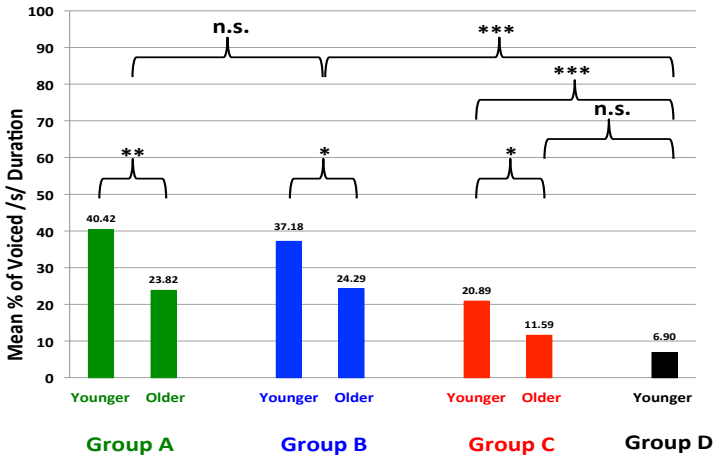


Figure 4. Effects of language profile group and age on Spanish intervocalic /s/-voicing

Regarding the aforementioned main effect of gender, intervocalic /s/-voicing was greater in the speech of females than males. In light of the significant interaction effect between gender and the combined language profile and age groups, Tukey post-hoc analyses were conducted specifically to test for whether or not the gender effect was absent, of a significantly lesser or greater magnitude, or in a different direction than the main effect in any one or set of language profile and age groups. The pairwise comparisons revealed that the gender effect (favoring greater voicing in female speech) was present and of a consistent magnitude across all language profile and age groups, except for the Madrid monolinguals, for whom the effect did not reach statistical significance (for Group D, p=.98). Figure 5 offers a visualization of this Barcelona-specific stratification by gender for intervocalic /s/-voicing.

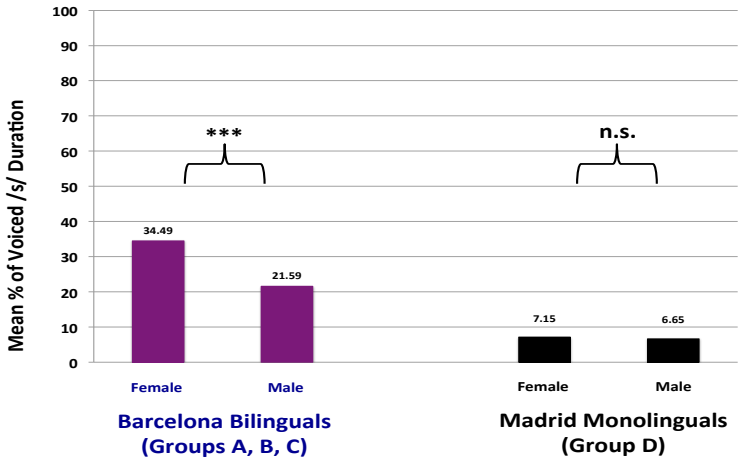


Figure 5. Effect of gender on Spanish intervocalic /s/-voicing

With respect to the aforementioned main effect of style, intervocalic /s/-voicing was greater in more casual speech (e.g. sociolinguistic interviews) than more careful speech (e.g. phrase-list reading task). The lack of significant interaction effect between style and the combined language profile and age groups indicates that all speakers, regardless of age and language profile, equally lessen the degree of intervocalic /s/-voicing in more formal speech contexts, suggestive of the status of [z] as a less standard or prescriptive variant than [s]. Figure 6 offers a visualization of this stratification by style for intervocalic /s/-voicing.

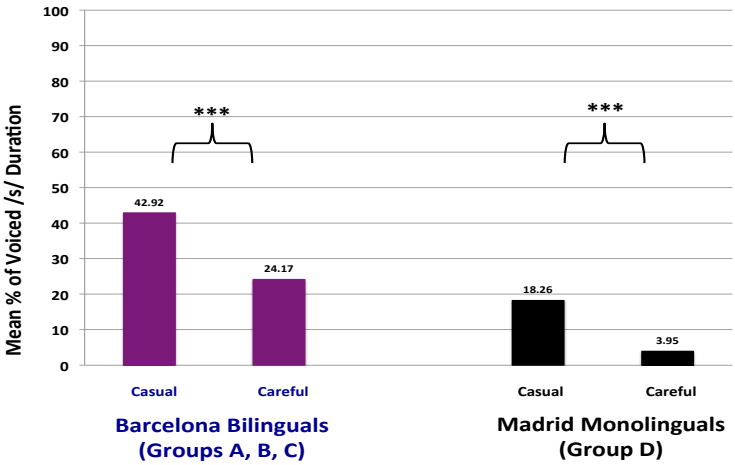


Figure 6. Effect of style on Spanish intervocalic /s/-voicing

5.2.2 *Linguistic factors conditioning intervocalic /s/-voicing*

With respect to the aforementioned main effect of stress, intervocalic /s/-voicing was greater in unstressed contexts than stressed ones. The lack of significant interaction effect between stress and the combined language profile and age groups indicates that all speakers, regardless of age and language profile, equally lessen the degree of intervocalic /s/-voicing across stressed contexts, consistent with the characterization of intervocalic /s/-voicing as an endogenous or structural process of lenition. Figure 7 offers a visualization of this stratification by stress for intervocalic /s/-voicing.

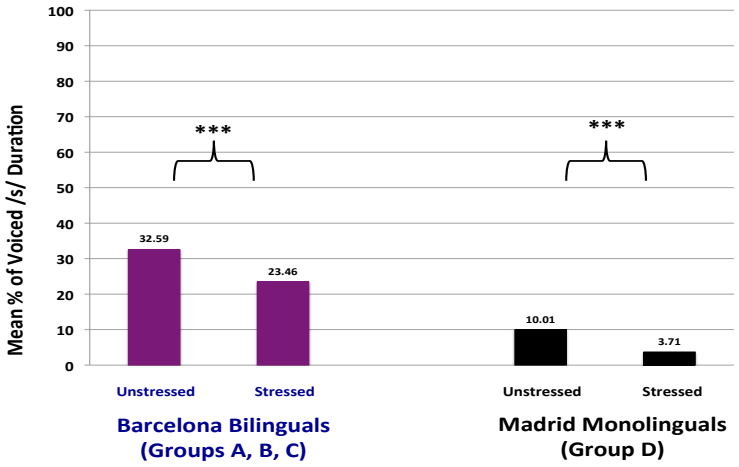


Figure 7. Effect of stress on Spanish intervocalic /s/-voicing

Regarding the aforementioned main effect of word position, intervocalic /s/-voicing was greater in word-final prevocalic contexts than word-initial contexts. Due to the significant interaction effect between word position and the combined language profile and age groups, Tukey post-hoc analyses were conducted specifically to test for whether or not the word position effect was absent, of a significantly lesser or greater magnitude, or in a different direction than the main effect in any one or set of language profile and age groups. The pairwise comparisons revealed

that though all language profile and age groups were significantly sensitive to the word position effect (for all, p<.0001), the magnitude of effect (favoring greater voicing in unstressed contexts) was hierarchical, with the strongest effect for younger speakers and speakers with the most exposure to and use of Catalan, and the weakest effect for the Madrid monolinguals. Figure 8 visualizes this hierarchical effect, which is approximately 16 times as strong for Group A younger speakers than for their Madrid monolingual peers.

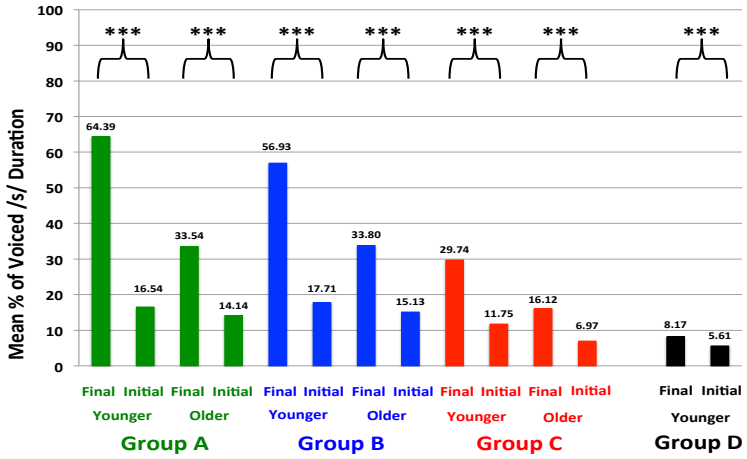


Figure 8. Effect of word position on Spanish intervocalic /s/-voicing

Though we have analyzed intervocalic /s/-voicing as an inherently gradient phenomenon, this phonetic feature's continuous measurement nonetheless presents discrete endpoints at 0% and 100% voiced segment duration, permitting an additional analysis of discrete counts of 100% voiced /s/ tokens that can uncontestably be classified as voiced [z]. Thus, to complement the aforementioned analyses of greater or lesser degrees of fricative voicing and best assess the frequency of [z] in Barcelonan Spanish, we have additionally calculated the proportion of /s/ tokens produced with full or 100% voiced segment duration. In one analysis, displayed in Figure 9, word position is examined across language profile and age groups, which suggests that the envelope of variation of intervocalic [z] should likely be delimited to exclusively word-final

prevocalic contexts, since a (near-)categorical absence of [z] in word-initial contexts is attested for Barcelonan bilinguals. In the other analysis, displayed in Figure 10, speech style is examined exclusively with word-final prevocalic tokens and shows that for all younger bilinguals, intervocalic [z] is in fact the majority variant (i.e., over 50% use) in casual speech.

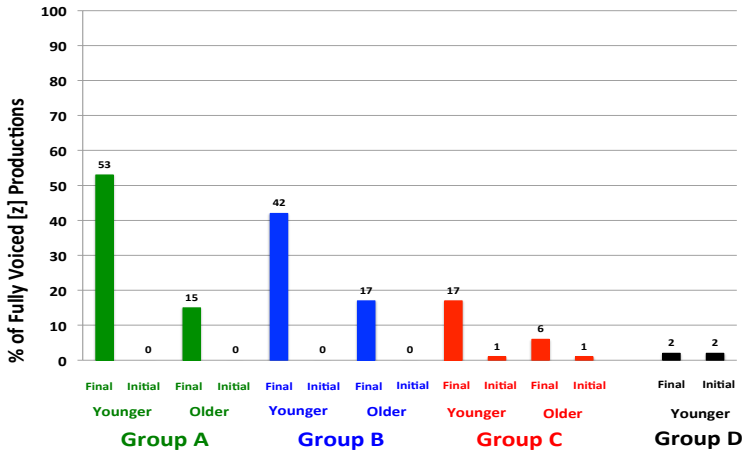


Figure 9. Percentages of 100% voiced [z] productions by word position in Barcelonan Spanish

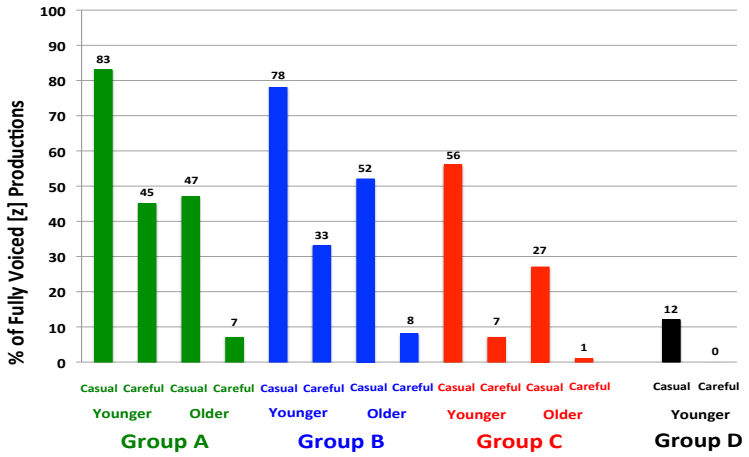


Figure 10. Percentages of 100% voiced word-final [z] productions by style in Barcelonan Spanish

6. Discussion

The results of the present empirical investigation of intervocalic /s/ voicing plainly illustrate its prevalence in Barcelonan Spanish, the confluence of linguistic and social factors that constrain its use, and ultimately its status as a vitalic, regional marker of Catalonian Spanish. A comparison of voicing degrees between Barcelonan bilinguals and Madrid monolinguals reveals that a significantly stronger degree of intervocalic fricative voicing is used by all bilingual speakers, including even the older generation of more Spanish-dominant (Group C) bilinguals. Concrete production counts of 100% voiced word-final tokens in casual speech show that these speakers produce [z] over twice as often (27%) as the Madrid speakers (12%), with younger speakers in fact producing [z] as a majority variant (56% for Group C, 78% for Group B, and 83% for Group A).

While no language profile and age group produces fully voiced [z] as a majority variant in careful speech, younger Barcelonans with the greatest exposure to and use of Catalan (Group A) now approach the 50% threshold, evidencing a remarkably systematic degree of intervocalic voicing that serves to distinguish this contact variety from most if not all other varieties of Spanish lacking an alveolar voicing contrast (i.e., outside of Judeo-Spanish).

Wesch (1997: 296) impressionistically reported that intervocalic fricative voicing in Barcelona was a frequent phenomenon, but was not socially stratified. The present data, collected nearly two decades later using an empirical experimental methodology, paints quite a different picture. As previously mentioned, greater degrees of Catalan exposure and use were linked to greater degrees of intervocalic /s/-voicing, though voicing degrees for the more

Catalan-dominant speakers in the urban capital (Group B) and more rural outskirts of the BMA (Group A) were comparable. Moreover, significant sensitivities to speech style, age, and gender, respectively favoring stronger voicing degrees in the casual speech of youth females, pattern consistently with a change in progress from below (Labov 2001), whereby greater voicing degrees as a non-standard feature lacking overt awareness and negative social stigma (following matched guise evidence provided by Davidson [2019]) are being adopted by the Barcelonan speech community as led by more Catalan-dominant and younger female speakers. This apparent time increase in percentage of voiced segment duration is complemented by a generational shift in preference for fully voiced and word-final [z] in casual speech, in that whereas no older bilingual group favors [z], all of the younger bilinguals now use [z] as a majority variant. While there may be contact features in Catalonian Spanish that are becoming less frequent in the younger generation of Barcelonans, it is clear that Arnal's (2011) claim of a complete lack of phonetic contact features in modern Catalonian Spanish is a gross overgeneralization wholly unsupported by empirical data. Instead, the present data support intervocalic /s/-voicing (as a word-final phenomenon) in Barcelonan Spanish as a developing sociolinguistic regional marker of bilingual Spanish, with stronger voicing degrees (crucially irrespective of age and Catalan language dominance) than monolingual varieties such as Madrid Spanish, and positive associations of a bilingual identity and solidarity (Davidson 2019).

With regard to the linguistic conditioning of intervocalic /s/-voicing, significant sensitivities to stress (favoring greater voicing degrees across unstressed sequences) and word position (favoring greater voicing word-finally over word-initially) were found for both Barcelonan Spanish and Madrid Spanish. Both of these effects have been attested across multiple Spanish varieties as predictable properties of articulatory lenition, accounting for their conditioning of not

only intervocalic fricative voicing, but also aspiration and elision (Chappell 2017; File-Muriel 2010; Hualde 2014; Nam 2009; Torreira 2012). While these language-internal or endogenous motivations clearly play a role in Barcelonan Spanish, it is difficult to account for the unique magnitude of effect for word position through endogeny alone. Cross-varietal comparisons of the rates of fully voiced [z] production in a more casual speech style, offered in Table 4, reveal that younger Catalan-dominant (Groups A and B) bilinguals' categorical application of word-final full voicing is indeed unique to this contact setting.

Table 4. Frequencies of fully voiced intervocalic [z] in casual styles of Spanish varieties (adapted from Hualde 2014, Madrid; Schmidt 2011, Mexico City; Chappell 2017, San Jose; García 2015, Loja)

	Word-Initial	**Word-Final**
Madrid, Spain	10.6%	12.5%
Mexico City, Mexico	9.4%	N/A
San José, Costa Rica	37.5%	55.1%
Loja, Ecuador	26.4%	32.1%
Barcelona, Spain	0%	80.3%

While the sheer quantity of [z] production observed in Barcelonan Spanish is enough to distinguish it from other varieties that have been empirically examined, the unusually high rates of [z] production of San José Spanish force a closer inspection of the magnitude of word position effect in order to best characterize this phenomenon in the Catalan contact setting. Though all varieties exhibit less intervocalic [z] production word-initially, all but Barcelonan Spanish display sizeable proportions of word-initial [z] relative to that of word-final position. The present

Barcelonan data, however, show a categorical barring of word-initial voicing, for which purely phonetic propensities of heightened lenition in word-final contexts cannot account. Instead, we appeal to a phonotactic constraint of Catalan, namely the loss of a phonemic voicing contrast word-finally but crucially not word-initially (Hualde 1992, 2014; Julià; Pieras 1999; Prieto 2004; Recasens 2014; Wheeler 2005), which appears to be wholly active in the Spanish of Catalan-dominant speakers of Barcelona. As the more Spanish-dominant (Group C) bilinguals nearly categorically avoided fully voiced [z] in word-initial contexts (with a 1% occurrence, half the rate of Group D monolinguals), the observed word position effect is in fact mediated by exposure and use of Catalan (i.e., stronger with greater exposure to and use of Catalan), all the more evidencing the role of language contact in intervocalic /s/-voicing in Barcelona.

7. Conclusion

Contrary to Arnal (2011), the influence of Catalan on Spanish in regards to phonetic phenomena is far from negligible, despite the continued state of asymmetric bilingualism in Catalonia. This chapter has shown that Catalan's status as a minority language in Catalonia, both socially and linguistically, is questionable, and while outcomes of language variation and change are not wholly dictated by the majority- or minority-language status of the language varieties in question, the present case of intervocalic /s/-voicing demonstrates how with favorable social conditions for the "minority" language, linguistic influence need not ever be exclusively unidirectional.

As the research on Spanish intervocalic /s/-voicing remains largely impressionistic, the continued empirical investigation of the degree of presence and the linguistic and social correlates of this phenomenon across the world's Spanish varieties will remain valuable. Particularly in related settings of Spanish contact with Catalan, such as in Valencia or the Balearic Islands, the study of intervocalic /s/-voicing will further illuminate the mechanisms that drive linguistic innovation and eventual change in bilingual communities, while simultaneously offering insights into the distinct language outcomes that come about in unique contact settings where the status and linguistic capital of Spanish and Catalan vary widely.

Appendix: Stimuli in Recorded Phrase Reading Task

Word-initial /s/, unstressed /a/

*primavera **s**in lluvia* ‘Spring without rain’

*estaba **s**alado* ‘it was salty’

*escribía **s**obre el país* ‘s/he wrote about the country’

*quería **s**altar* ‘I wanted to jump’

*carta **s**in nombre* ‘letter without a name’

había salchichas ‘there were sausages’

*cantaba **s**obre el amor* ‘I sang about love’

*buena **s**alud* ‘good health’

*agua **s**in gas* ‘non-carbonated water’

*era **s**agrada* ‘it was holy’

*historia **s**obre la guerra* ‘story about war’

*había **s**almón* ‘there was salmon’

*problema **s**in remedio* ‘problem without a solution’

*quería **s**aber* ‘s/he wanted to know’

*leyenda **s**obre el universo* ‘legend about the universe’

*era **s**alvaje* ‘s/he was savage’

*comía **s**in parar* ‘I ate non-stop’

*estaba **s**abrosa* ‘it was tasty’

*habla **s**obre el futuro* ‘s/he speaks about the future’

*sentía **s**atisfacción* ‘I felt satisfaction’

Word-initial /s/, stressed /a/

*estará **s**in remedio* ‘s/he will not have a solution’

*habrá **s**almón* ‘there will be salmon’

*leerá **s**obre el universo* ‘s/he will read about the universe’

*será **s**alvaje* ‘s/he will be savage’

*comerá **s**in parar* ‘s/he will eat non-stop’

*estará **s**abrosa* ‘it will be tasty’

*aprenderá **s**obre la política* ‘s/he will learn about politics’

*querrá **s**aber* ‘s/he will want to know’

*dormirá **s**in problemas* ‘s/he will sleep without problems’

*sentirá **s**atisfacción* ‘s/he will feel satisfaction’

*hablará **s**obre el futuro* ‘s/he will speak about the future’

*tendrá **s**abor* ‘it will have flavor’

*está **s**in dinero* ‘s/he is without money’

*estará **s**alado* ‘it will be salty’

*cantará **s**obre el amor* ‘s/he will sing about love’

*querrá **s**altar* ‘she will want to jump’

*vivirá **s**in sentido* ‘s/he will live without meaning’

*será **s**agrada* ‘it will be holy’

*escribirá **s**obre el país* ‘s/he will write about the country’

*habrá **s**alchichas* ‘there will be sausages’

Word-final, unstressed /s/

*tra**s** amar* ‘after loving’

*era**s** abogada* ‘you were a lawyer’

*la**s** abuelas* ‘the grandmothers’

*chica**s** aburridas* ‘bored girls’

*tra**s** abril* ‘after April’

*estuviera**s** aquí* ‘that you were here’

*la**s** arañas* ‘the spiders’

*comía**s** arroz* ‘you ate rice’

*tra**s** abarcar* ‘after spanning’

*tienda**s** abiertas* ‘open stores’

*la**s** amistades* ‘the friendships’

*droga**s** adictivas* ‘addictive drugs’

*la**s** abejas* ‘the bees’

*bebía**s** alcohol* ‘you drank alcohol’

*tra**s** hablar* ‘after speaking’

*amiga**s** animadas* ‘animated friends’

*la**s** amigas* ‘the friends’

*puerta**s** abiertas* ‘open doors’

*tra**s** alguno* ‘after one’

*fuera**s** animado* ‘that you were animated’

Word-final, stressed /s/

*la**s** hachas* ‘the axes’

*dará**s** asco* ‘you will be disgusting’

*tra**s** años* ‘after years’

*dirá**s** algo* ‘you will say something’

*la**s** aguas* ‘the waters’

*será**s** apto* ‘you will be capable’

*tra**s** hábitos rotos* ‘after broken habits’

*será**s** ágil* ‘you will be agile’

*la**s** albas* ‘the dawns’

*hablará**s** árabe* ‘you will speak Arabic’

*tra**s** alguien* ‘after someone’

*explorará**s** áreas* ‘you will explore areas’

*la**s** águilas* ‘the eagles’

*romperá**s** almas* ‘you will break souls’

*tra**s** ambos coches* ‘after both cars’

*verá**s** arte* ‘you will see art’

*la**s** algas* ‘the seaweeds’

*mamá**s** altas* ‘tall mothers’

*tra**s** algo* ‘after something’

*tendrá**s** ánimo* ‘you will feel up (for it)’

Glossary

Asymmetric bilingualism: a typical outcome of language contact between a majority language and minority language in which societal acquisition (and consequentially, often the use) of one language (the minority language) is less prevalent than that of the other (majority language).

Change from above/below: a community of speakers' gradual adoption of a linguistic feature that either is (above) or is not (below) part of an explicit, prescriptive norm for more proper or correct speech.

Impressionistic research: the reporting of conclusions often based on personal observation or intuition, crucially without the carrying out of a replicable and formalized experimental design.

Linguistic marker: a linguistic feature whose usage in a given speech community serves to differentiate that community from other speech communities, and for which stylistic stratification is present (i.e., the feature is used either significantly more or significantly less in more careful speech relative to more spontaneous speech).

Phonetic allophony: the relationship between two or more speech sounds in which the substitution of one sound for another does not result in a change in meaning, often where the use of one sound vs. another is predictable by the kind of adjacent speech sound present.

Phonological contrast: the relationship between two or more speech sounds in which the substitution of one sound for another results in a change in meaning (e.g. /s/ vs. /z/ as evidenced by 'sue' and 'zoo').

Statistically significant effect: an observed difference that, given the quantity and distribution of collected data, has a 5% or less chance of being obtained if in fact there is no actual

difference in the greater population (e.g. if the percentage of voiced segment duration of intervocalic /s/ is 45% for stressed contexts and 60% for unstressed contexts, the observed difference or magnitude of a stress effect is 15%, and if this stress effect is statistically significant, then the likelihood of observing a difference of at least 15% across stress contexts, given our collected data size and distribution, would be 5% or less if in fact in the whole population of speakers, there is no difference in voicing between stressed and unstressed contexts).

Variant: a particular speech form (such as a sound, morpheme, vocabulary item, type of grammatical construction, etc.) that exemplifies a single way to produce the intended structure or meaning (e.g. [s] vs. [z] as two variants for /s/, *-ito* vs. *–illo* as two variants for the diminutive, *piña* vs. *ananá* as two variants for 'pineapple,' *¿cómo tú estás?* vs. *¿cómo estás tú?* as two variants of interrogative construction, etc.).

Variationist sociolinguistics: a subfield of linguistics that posits that linguistic variation is inherent to human language and is the precursor for language change, championed in the 1968 seminal work *Empirical Foundations for a Theory of Language Change* by Uriel Weinreich, William Labov, and Marvin Herzog.

Voicing assimilation: the variable production of voicing for a given speech sound (in this case, a fricative) based on the presence or absence of voicing of an adjacent speech sound.

References

Àngel Pradilla, Miquel. (2001). The Catalan-speaking communities. In M. T. Turell Julià (Ed.), *Multilingualism in Spain* (pp. 58-90). New York: Multilingual Matters Ltd.

Arnal, Antoni. (2011). Linguistic changes in the Catalan spoken in Catalonia under new contact conditions. *Journal of Language Contact,* 4, 5-25.

Azevedo, Milton M. (1992). *Introducción a la lingüística española*. New Jersey: Prentice Hall.

Bailey, Guy. (2004). Real and apparent time. In J. K. Chambers et al. (Eds.), *The handbook of language variation and change* (pp. 312-332). Malden: Blackwell.

Bailey, Guy, Wikle, Tom, Tillery, Jan, & Sand, Lori (1991). The apparent time construct. *Language Variation and Change,* 3(3), 241-264.

Ballart, Jordi. (2013). *Variació fònica al català de Barcelona: l'accent xava. Treballs de Sociolingüística Catalana,* 23, 133-151.

Benet, Ariadna, Cortés, Susana, & Lleó, Conxita. (2012). Devoicing of sibilants as a segmental cue to the influence of Spanish onto current Catalan phonology. In K. Braunmüller & C. Gabriel (Eds.), *Multilingual individuals and multilingual societies* (pp. 391-404). Amsterdam: John Benjamins.

Blas-Arroyo, José Luis. (2007). Spanish and Catalan in the Balearic Islands. *International Journal of the Sociology of Language,* 184, 79-93.

Bonet, Eulàlia, & Lloret, Maria-Rosa. (1998). *Fonologia catalana*. Barcelona: Ariel.

Boomershine, Amanda, & Stevens, Jons. (Forthcoming). Variable voicing by heritage Spanish speakers. In E. Núñez (Ed.), *Sociolinguistic approaches to sibilant variation in Spanish*. Amsterdam: John Benjamins.

Browman, Catherine P., & Goldstein, Louis. (1989). Articulatory gestures as phonological units.

Phonology, 6, 201-252.

Browman, Catherine P., & Goldstein, Louis. (1991). Gestural structures: Distinctiveness, phonological processes, and historical change. In. M. Mattingly & M. Studdert-Kennedy (Eds.), *Modularity and the motor theory of speech perception* (pp. 313-338). Hillsdale: Lawrence Erlbaum.

Campos-Astorkiza, Rebeka. (2014). Sibilant voicing assimilation in Peninsular Spanish as gestural blending. In M-H Côté & E. Mathieu (Eds.), *Variation within and across Romance languages: Selected papers from the 41st Linguistic Symposium on Romance Languages* (pp. 17-38). Amsterdam: John Benjamins.

Carrera-Sabaté, Josefina. (2009). Affricates in Lleidatà. In J. N. Stanford & D. R. Preston (Eds.), *Variation in indigenous minority* languages (pp. 77-107). Philadelphia: John Benjamins.

Casanovas Català, Montse. (1995). *La interferencia fonética en el español de Lleida: algunos apuntes para su estudio*. *Sintagma,* 7, 53-59.

Chambers, Jack K. (2004). Patterns of variation including change. In J.K. Chambers, et al., (Eds.), *The handbook of language variation and change* (pp. 349-372). Malden: Blackwell.

Chappell, Whitney. (2016). On the social perception of intervocalic /s/ voicing in Costa Rican Spanish. *Language Variation and Change,* 28, 357-378.

Chappell, Whitney, & García, Christina. (2017). Variable production and indexical social meaning: On the potential physiological origin of intervocalic /s/ voicing in Costa Rican Spanish. *Studies in Hispanic and Lusophone Linguistics,* 10(1), 1-37.

Clegg, J. Halvor, & Strong, Robert M. (1992). Assimilation of the phoneme /s/ in Spanish. In E. L. Pederson (Ed.), *Proceedings of the Deseret Language and Linguistic Society 1992*

Symposium (pp. 31-34). Provo: Deseret Language and Linguistics Society.

Dalbor, John B. (1997). *Spanish pronunciation: Theory and practice*. Boston: Harcourt Brace.

Davidson, Justin. (2015). Intervocalic fricative voicing in the Spanish of Barcelona: Considerations for contact-induced sociophonetic innovation. In K. Potowski & T. Bugel (Eds.), *Sociolinguistic change across the Spanish-speaking word: Case studies in honor of Anna María Escobar* (pp. 119-146). Frankfurt: Peter Lang.

Davidson, Justin. (2019). Covert and overt attitudes towards Catalonian Spanish laterals and intervocalic fricatives." In W. Chappell (Ed.), *Recent advances in the study of Spanish sociophonetic perception* (pp. 39-84). Philadelphia: John Benjamins.

Erker, Daniel Gerard. (2012). *An acoustically based sociolinguistic analysis of variable coda /s/ production in the Spanish of New York City* (Unpublished Ph.D. dissertation). New York University.

File-Muriel, Richard, & Brown, Earl. (2010). The gradient nature of s-lenition in Caleño Spanish. *University of Pennsylvania Working Papers in Linguistics,* 16(2), 46-55.

File-Muriel, Richard, & Brown, Earl. (2011). The gradient nature of s-lenition in Caleño Spanish. *Language Variation and Change,* 23, 223-243.

File-Muriel, Richard, Brown, Earl, & Gradoville, Michael. (Forthcoming). A sociophonetic approach to s-realization in the Colombian Spanish of Barranquilla. In *Sociolinguistic approaches to sibilant variation in Spanish*, edited by E. Núñez. Amsterdam: John Benjamins.

García, Alison. (2013). *Allophonic variation in the Spanish sibilant* (Unpublished Ph.D. dissertation). University of Wisconsin-Milwaukee.

García, Christina. (2015). *Gradience and variability of intervocalic /s/ voicing in Highland*

Ecuadorian Spanish (Unpublished Ph.D. dissertation). The Ohio State University, Columbus.

Generalitat de Catalunya. (2009). *Immigration, here and now: Catalonia 2008 statistical data*. Barcelona: Generalitat de Catalunya.

Generalitat de Catalunya. (2014). *Principals resultats de l'enquesta d'usos lingüístics de la població 2013*. Barcelona: Generalitat de Catalunya.

Gradoville, Michael Stephen. (2011). Validity in measurements of fricative voicing: Evidence from Argentine Spanish. In S. M. Alvord (Ed.), *Selected Proceedings 5th Conference on Laboratory Approaches to Romance Phonology* (pp. 59-74). Somerville: Cascadilla.

Gradoville, Michael Stephen. (Forthcoming). Variable voicing in Argentine Spanish /ʒ/. In E. Núñez (Ed.), *Sociolinguistic approaches to sibilant variation in Spanish*. Amsterdam: John Benjamins.

Hualde, José Ignacio. (1992). *Catalan*. New York: Routledge.

Hualde, José Ignacio. (2014). *Los sonidos del español*. New York: CUP.

Hualde, José Ignacio, Olarrea, Antxon, Escobar, Anna María et al. (2010). *Introducción a la lingüística hispánica*. New York: Cambridge UP.

Hualde, José Ignacio, & Prieto, Pilar. (2014). Lenition of intervocalic alveolar fricatives in Catalan and Spanish. *Phonetica,* 71(2), 109-127.

Institut d'Estadística de Catalunya. Territori: Banc d'estadístiques de municipis i comarques. (2011). Retrieved March 20, 2019, from http://www.idescat.cat.

Institut d'Estadística de Catalunya. Territori: Banc d'estadístiques de municipis i comarques. (2014). Retrieved March 20, 2019, from http://www.idescat.cat.

Jesus, Luis M. T., & Shadle, Christine H. (2003). Devoicing measures of European Portuguese. In N. J. Mamede et al. (Eds.), *Proceedings from the 6th International Workshop for*

Computational Processing of the Portuguese Language (pp. 1-8). Berlin: Springer.

Julià i Muné, Joan. (2008). *Els sons del català*. In J. Solà, et al. (Eds.), *Gramàtica contemporani. Volum 1: Introducció, fonètica i fonologia, morfologia* (pp. 37-87). Barcelona: Empúries.

Labov, William. (2001). *Principles of linguistic change: Social factors*. Malden: Blackwell.

Lleó, Conxita, Cortés, Susana, & Benet, Ariadna. (2008). Contact-induced phonological changes in the Catalan spoken in Barcelona. In P. Siemund & N. Kintana (Eds.), *Language contact and contact languages* (pp. 185-212). Amsterdam: John Benjamins.

Martínez Celdrán, Eugenio, & Fernández Planas, Ana M. (2007). *Manual de fonética española*. Barcelona: Ariel.

Mas i Miralles, Antoni. (1993). *El canvi lingüístic del català en l'administració eclesiàstica d'Elx en l'edat moderna* (Unpublished Ph.D. dissertation). Universidad de Alicante.

Moreno Fernández, Francisco. (2009). *Principios de sociolingüística y sociología del lenguaje*. Barcelona: Ariel.

Morgan, Terrell A. (2010). *Sonidos en contexto: una introducción a la fonética del español con especial referencia a la vida real*. New Haven: Yale UP.

Nam, Hosung, Goldstein, Louis, & Saltzman, Elliot. (2009). Self-organization of syllable structure: A coupled oscillator model. In F. Pellegrino et al. (Ed.), *Approaches to phonological complexity* (pp. 299-328). Berlin: Mouton de Gruyter.

Navarro Tomás, Tomás. (1918). *Manual de pronunciación española*. Madrid: Imprenta de los Sucesores de Hernando.

Newman, Michael, Trenchs-Parera, Mireia, & Shukhan, Ng. (2008). Normalizing bilingualism: The effects of the Catalonian linguistic normalization policy one generation after. *Journal of Sociolinguistics,* 12(3), 306-333.

Payrató, Lluís. (1985). *La interferència lingüística: Comentaris i exemples català-castellà*. Barcelona: Curial Edicions Catalanes / Publicacions de l'Abadia de Montserrat.

Pieras, Felipe. (1999). *Social dynamics of language contact in Palma de Mallorca: Attitude and phonological transfer* (Unpublished Ph.D. dissertation). Pennsylvania State University.

Prieto, Pilar. (2004). *Fonètica i fonologia. Els sons del català*. Barcelona: Editorial UOC.

Quilis, Antonio. (1981). *Fonética acústica de la lengua española*. Madrid: Gredos.

Recasens, Daniel. (2014). *Fonètica i fonologia experimentals del català: Vocals i consonants*. Barcelona: Institut d'Estudis Catalans.

Rivas, María Verónica. (2006). *Does the perception of fricatives correspond to their production? The case of Italian vs. Dutch* (Unpublished Master's thesis). University of Amsterdam.

Rohena-Madrazo, Marcos. (2015). Diagnosing the completion of a sound change: Phonetic and phonological evidence for /ʃ/ in Buenos Aires Spanish. *Language Variation and Change* 27, 287-317.

Romero, Joaquín. (1999). The effect of voicing assimilation on gestural coordination. In J. Ohala et al. (Eds.), *Proceedings of the 14th International Congress of Phonetic Sciences* (pp. 1793-1796). San Francisco: American Institute of Physics.

Sankoff, Gillian, & Blondeau, Hèléne (2007). Language change across the lifespan: /r/ in Montreal French. *Language,* 83(3), 560-588.

Schmidt, Lauren B., & Willis, Erik W. (2011). Systematic investigation of voicing assimilation of Spanish /s/ in Mexico City. In S. M. Alvord (Ed.), *Selected proceedings: 5th conference on laboratory approaches to Romance phonology* (pp. 1-20). Somerville: Cascadilla.

Schwegler, Armin, Kempff, Juergen, & Ameal-Guerra, Ana. (2010). *Fonética y fonología españolas*. New Jersey: John Wiley.

Serrano Vázquez, María del Carmen. (1996). Rasgos fonéticos del carácter interferencial en el castellano de una comunidad bilingüe. *Estudios de Lingüística,* 11, 365-383.

Siguan, Miguel. (1988). Bilingual education in Spain. In C. Bratt Paulston (Ed.), *International handbook of bilingualism and bilingual education* (pp. 449-473). New York: Greenwood.

Sinner, Carsten. (2002). The construction of identity and group boundaries in Catalan Spanish. In A. Duszak (Ed.), *Us and others: Social identities across languages, discourses and culture* (pp. 159-185). Philadelphia: John Benjamins.

Smith, Caroline L. (1997). The devoicing of /z/ in American English: Effects of local and prosodic context. *Journal of Phonetics,* 25, 471-500.

Stevens, Kenneth N., Sheila E. Blumstein, et al. (1992). Acoustic and perceptual characteristics of voicing in fricatives and fricative clusters. *Journal of the Acoustical Society of America,* 91(5), 2979-3000.

Strycharczuk, Patrycja, Marijn van't Veer, et al. (2014). Phonetic evidence on phonology-morphosyntax interactions: Sibilant voicing in Quito Spanish. *Journal of Linguistics*, 1-50.

Tagliamonte, Sali. (2012). *Variationist sociolinguistics: Change, observation, interpretation*. Oxford: Wiley-Blackwell.

Teschner, Richard V. (1996). *Camino oral: Fonética, fonología y práctica de los sonidos del español*. New York: McGraw-Hill.

Torreira, Francisco, & Ernestus, Mirjam. (2012). Weakening of intervocalic /s/ in the Nijmegen corpus of casual Spanish. *Phonetica*, 69, 124-148.

Turell Julià, Maria Teresa. (2000). More on the interplay between internal and external factors: Dialect convergence and divergence of Catalan. In K. Mattheier (Ed.), *Dialect and migration in a changing Europe* (pp. 43-56). Frankfurt: Peter Lang.

Vallverdú, Francesc. (1984). A sociolinguistic history of Catalan. *International Journal of the Sociology of Language*, 47, 13-28.

Vann, Robert. (2001). El castellà catalanitzat a Barcelona: Perspectives lingüístiques i culturals. *Catalan Review*, 15(1), 117-131.

Vila i Moreno, Xavier, Vial, Santi, & Galindo, Mireia. (2005). Language practices in bilingual schools: Some observed, quantitative data from Catalonia. In X. P. Rodríguez-Yáñez et al. (Eds.), *Bilingualism and education: From the family to the school* (pp. 317-329). Munich: Lincom.

Vila-Pujol, Maria Rosa. (2007). Sociolinguistics of Spanish in Catalonia. *International Journal of the Sociology of Language*, 184, 59-77.

Wesch, Andreas. (1997). *El castellano hablado de Barcelona y el influjo del catalán: esbozo de un programa de investigación*. *Anuario Galego de Filoloxía*, 24, 287-312.

Wheeler, Max W. (2005). *The phonology of Catalan*. Oxford: Oxford UP.

Topics for Discussion

(1) Would you have guessed that the production of Spanish /s/ is the most studied consonantal phenomenon in Hispanic Linguistics? Why do you think /s/ has been so popular, so to speak, relative to other speech sounds in Spanish? If you could learn more about any other speech sound of Spanish, which sound would you choose and why?

(2) Consult a language atlas and research the language varieties of Spain. Beyond Spanish, Basque, Catalan, and Galician, what other languages can you find? What social and political implications are there for these languages, given that they are not deemed co-official in any Autonomous Community by the Spanish Constitution?

(3) Though Catalan is a minority language in Spain as a whole, its status as a minority language within Catalonia is more questionable. Review the linguistic census figures provided in this chapter (or find additional ones for yourself at the website of the Statistical Institute of Catalonia, <idescat.cat>) and discuss how appropriate it is to label Catalan a minority language, relative to Spanish, in Catalonia.

(4) While the present study focuses on Catalan as a source for intervocalic /s/-voicing in Spanish, a parallel case of phonological transfer exists for English and Spanish. Identify the English alveolar fricative voicing contrast and describe how English-Spanish bilinguals might produce Spanish intervocalic [z] as influenced by English phonology.

(5) The case of Spanish prevocalic word-final [z] was treated as a largely phonetic phenomenon, since this position does not productively create many minimal pairs in Spanish (i.e., the use of [s] vs. [z] would not change the meaning of the phrase in which the sound appeared). Nonetheless, there does exist a small set of minimal phrase pairs in Spanish where prevocalic word-final /s/-voicing would distinguish between, on the one hand, a sequence of a word ending in a vowel followed by a word with initial /s/ + vowel (which would yield intervocalic [s]), and on the other hand, a sequence of a word ending in vowel + /s/ followed by a word with an initial vowel (which would yield intervocalic [z]). Can you come up with any examples of this kind of minimal phrase pair? (Hint: Consider the act of *salting* a chicken *wing* in Spanish).

(6) The Gender Paradox, which refers to the common finding that females tend to be the leaders of linguistic change both when the novel feature in question is standard as well as non-standard, has been the topic of considerable investigation by variationist sociolinguists, since there are multiple, unique accounts that have been posited to explain why females so often assume this leadership role in advancing linguistic change. Investigate the Gender Paradox and see what accounts have been posited in order to decide for yourself whether or not any single rationale is fully convincing.

(7) Though sociolinguists' use of a more casual interview alongside a word or phrase reading is a common methodological juxtaposition in order to compare more careful speech to more spontaneous speech, the notion that one's speech would differ dramatically between oral conversation and oral read-alouds is often surprising to non-linguists. Can you identify any

speech features that you modify when you read a text aloud vs. speak in conversation with a friend?

(8) To more directly assess stylistic variation in Spanish for yourself, access an online speech corpus that offers recordings of spontaneous speech and read speech from the same individuals (such as the *Dialectoteca del español*: <dialects.its.uiowa.edu>) and select a speech feature to examine across these styles, such as the production of syllable-final /s/ as either [s] or aspirated [h] / elided [Ø]. Quantify the frequency of each variant's production in each style and discuss whether or not the variant whose frequency increases with more careful speech matches your intuition for which of the variants is more standard or prescriptively correct.

(9) What other features of Catalonian Spanish are you familiar with? Research additional contact features of Spanish in contact with Catalan, and given your familiarity with non-contact varieties of Spanish, identify which features are seemingly unique to Catalonian Spanish, and which are features that are also found in non-contact settings.

(10) The lexicon is often considered the domain of grammar most susceptible to influence from contact with another language. Select a contact setting of Spanish (say, Spanish-English bilingualism in the United States) and consider the features that comprise each language that could logically be sourced from language contact (i.e., what Spanish-like features are used in U.S. English and what English-like features are used in U.S. Spanish?). Are there more instances of lexical borrowing than, say, phonological or morphosyntactic borrowings? Can

you offer an account of why the lexicon would be the most susceptible to contact influence? (Hint: consider the intensity of contact with Spanish an L1-English speaker would likely require before actively using words like *barrio* and *queso* in English, compared with actively using the rhotic trill /r/ or suffixal time and person morphology [e.g. 2nd person singular future *–ás*] in English).

Notes

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[2] The remaining 13% constitute non-native speakers of Catalan and Spanish, in addition to bilingual speakers reporting both Spanish and Catalan as dual first languages.

[3] The city of Barcelona boasts greater populations of non-Catalonian immigrants than the rest of the region. For instance, in 2009, between 40-44% of the population of the BMA, excluding the city of Barcelona, were non-Catalonian immigrants, whereas in the capital city over 44% of the population were non-Catalonian immigrants (Generalitat 2011: 38).

[4] The present elicited production data were collected from the same participants that completed the matched guise experiment reported in Davidson (2019).