

Intervocalic /s/ voicing in Catalanian Spanish

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Sean McKinnon

The Ohio State University
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Project Advisor:
Professor Terrell A. Morgan, Department of Spanish and Portuguese

ABSTRACT

Ever since the early fifteenth century, Catalan and Spanish have been in contact with one another (Vila-Pujol 2007). This situation of language contact would logically give rise to a unique dialect of Spanish, that being Catalanian Spanish. However, this variety has been widely ignored by the academic community at large; it was not mentioned in Zamora Vicente's book on *Dialectology in Spain* (1970) and the influential Spanish linguist John Lipski (In Manuscript) makes no mention of it in any of his works on Spanish dialectology or language contact in the Spanish speaking world. Although research has been dedicated to the study of how Spanish influences Catalan, there have been few studies on how the Spanish spoken in Catalonia is influenced by Catalan, especially in terms of phonology.

The present study looks at intervocalic /s/ voicing in Catalanian Spanish as a product of contact-induced change and seeks to describe the linguistic and sociolinguistic factors that favor the voicing of /s/. Furthermore, this paper will argue that /s/ voicing is not a byproduct of the Spanish brought to Catalonia by the Castilians, but rather the imposition of a specific Catalan phonological rule onto the bilingual's spoken Spanish. Finally, the results will support other findings and principles guiding /s/ voicing in Spanish, particularly in regards to the current research being done on Ecuadorian Spanish.

For this study, interviews with sixteen native Spanish/Catalan bilinguals were conducted during the summer of 2011. The sociolinguistic interview included questions about Catalanian politics, traditions and language use, followed by a reading paragraph that was created to elicit possible /s/ voicing tokens in five different linguistic contexts. The /s/ tokens from the reading paragraph and seven minutes of the sociolinguistic interview were acoustically analyzed and then coded by percent voicing; they were then divided into three categories: 0% to 20% percent

voicing were deemed ‘voiceless,’ 21% to 90% ‘partially voiced,’ and 91% to 100% ‘fully voiced.’ The tokens were then analyzed by their intervocalic context (word-initial, word-final, /s/ in Spanish but /z/ in Catalan, /s/ in both Spanish and Catalan and a Vs#sV structure) and by social factors such as gender, province of origin and daily language of use (i.e. do they speak more Catalan or Spanish in their daily lives?).

Overall, 2714 tokens were analyzed; 13.3% of the tokens were fully voiced, and another 26.3% were partially voiced. Statistical analysis showed that both the intervocalic context and all of the social factors were significant. A multivariate analysis was performed and found that intervocalic word-final /s/, spontaneous speech, males, and people who either use both languages equally or use Catalan more are all factors that favor voicing. Finally, the token distribution and factors in this study are similar to García’s work on /s/ voicing in Ecuador (2011), perhaps suggesting that there may be guiding principles for /s/ voicing in Spanish.

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Chapter 1: Introduction and Background

1.1 Introduction

Throughout history, the Iberian Peninsula has been an important center for the exchange of cultures, commerce and ideas, from the Roman Empire, to the modern-day Portuguese and Spanish states. Because of its strategic location, with access to both the Mediterranean Sea and Atlantic Ocean, the Peninsula has seen its fair share of invasions and re-conquests, not to mention the rise and fall of numerous empires. Each power transition typically led to the introduction of a new language, such as Latin with the Romans and Arabic with the Moors. Given this long history it is no surprise that today the Iberian Peninsula is home to Portuguese, Galician, Basque, Spanish and Catalan, in addition to other languages such as Aragonese and Leonese. This linguistic situation would logically give rise to the possibility for contact-induced change, and that is indeed the case; however, the literature has mainly focused on how Spanish has influenced the other “minority” languages of the Peninsula, especially Catalan.

The purpose of this study is to demonstrate that the contact situation between Spanish and Catalan is not entirely one-sided, that Catalan has influenced the Spanish spoken in Catalonia. This thesis will focus on the undocumented phenomenon of intervocalic /s/ voicing (henceforth, simply referred to as ‘/s/ voicing’) in Catalanian Spanish and describe what linguistic and sociolinguistic factors seem to favor the voicing of /s/. Furthermore, this study will show that /s/ voicing in Catalanian Spanish is the product of contact-induced change, and not the byproduct of Medieval Spanish. Finally, this paper will support other findings and principles guiding /s/ voicing in Spanish, particularly in regards to the current research being done on Ecuadorian Spanish.

1.2. Contact between Spanish and Catalan

The Catalan language, just like its Iberian sisters Spanish and Portuguese, is derived from Vulgar Latin and it is considered to be the native language of Catalonia, as declared by the autonomous community's revised Statute of Autonomy in 2006 (gencat.cat). However, the language is spoken by over nine million people in the autonomous communities of Valencia, the Balearic Islands and the western strip of Aragon, in addition to Andorra, the Roussillon region of France and the town of Alghero in Sardinia, Italy. Figure 1 shows the Catalan-speaking regions.

Figure 1: Map of the Catalan-speaking Regions¹



¹ "Map of Catalan-speaking regions." [Online image] Available at

Given that all the regions that speak Catalan are also bilingual this would logically lead to a language contact situation, in which the languages would influence and change one another. However, the literature so far has focused on only two topics: bilingualism (e.g. code-switching) and how Spanish has influenced Catalan. Spanish has certainly had a major influence on Catalan, in part because of the surge of monolingual Spanish immigration to Catalonia during the 1970s. Arnal (2011) points out that Catalan has extensively borrowed lexical items from Spanish although there already exists a Catalan word that means the same thing (e.g. loan word *passillo* from the Span. *pasillo*; Cat. *passadis*). Furthermore, he claims that by the end of the twentieth century the contact situation with Spanish had greatly affected Catalan's syntax and its phonetics, so much that "there is a widespread feeling that the Catalan spoken by young people is losing authenticity and becoming a sort of dialect of Spanish" (15).

Recently, there has been some research looking at the influence Catalan has had on the Spanish spoken in Catalonia, but only at a lexical and morphosyntactical level. Galindo Solé (2003) looked at whether the immersion education system, by which Catalan is the vehicle of instruction, had an affect on the spoken Spanish. Indeed, she found that the children had unique features in their syntax that was directly attributed to Catalan, like the introduction of a definite article before a proper name (Span. *Joan me dijo*; Cat. *El/En Joan em digué*; Catalanian Span. *El Joan me dijo*). Some of the children also pronominalized the Spanish verbs *adelgazar* 'to slim down' and *pensar* (when it means 'to believe') because that is how they are formed in Catalan (Span. *y adelgazas*; Cat. *i t'aprimes*; Catalanian Span. *y te adelgazas*). Furthermore, there was also favoring of the preposition *a* for situations that called for the Spanish preposition *en* and *por* instead of *para*; both can be directly attributed to influence from Catalan. Lexically speaking, the Spanish of Catalonia utilizes the verb *hacer* 'to make/do' more than standard Castilian

Spanish in certain expressions because the Catalan equivalent, *fer*, makes use of this ‘to make/do’ + noun form. For example, Galindo Solé writes that it is very common in Catalanian Spanish to hear phrases such as *hacer miedo* ‘to scare’ (Cat. *fer por*; Span. *dar miedo*), *hacer tarde* ‘to be late’ (Cat. *fer tard*; Span. *llegar tarde*) and *hacer un café* (Cat. *fer un cafè*; Span. *tomar un café*). Anecdotally, when I studied abroad in Barcelona I learned very quickly that the Catalan words *ara* ‘now’ and *feina* ‘work’ have replaced the Spanish counterparts *ahora* and *trabajo*, respectively, in spoken informal Spanish.

1.3 History of the Spanish Sibilants

Although modern Spanish lacks the distinction between the voiceless alveolar fricative (/s/) and its voiced counterpart (/z/) that has not always been the case. Latin began with only three fricative phonemes: /f/, /s/, /h/ as well as the geminate /ff/ and /ss/; since the words /kasa/ ‘hut’ and /kassa/ ‘empty’ were perceived as different, we can conclude that the Latin geminates were indeed phonemes themselves (Pharies 57). Since the geminate consonants were “physiologically expensive” to produce (Allen 94) they were simplified to a single consonant (e.g. /pp/ → /p/), while the original single consonants became voiced (e.g. /p/ → /b/), through the process of lenition. Geminate simplification affected the stops and fricatives, but the only fricative largely affected by the voicing change was /s/, which became voiced, so that by the Middle Ages the Latin geminate /ss/ was reduced to /s/ and the Latin /s/ had become /z/ (Allen 95).

However, /s/ and /z/ were not the only sibilant phonemes to come into existence before the Middle Ages. Four new sibilant phonemes were created thanks to the effect the palatal approximant [j], the “yod,” had on consonants. The creation of the yod was a relatively early process in Vulgar Latin, with the /e/ in hiatus manifesting itself as [j], as in the words *vīnea*

([wi:nea] → [winja] ‘vineyard’) and *lancea* ([lankea] → [lankja] ‘lance’). This set the stage for the affrication of /t/ and /k/ to \widehat{ts} and the palatalization of word-medial velar consonant clusters to either /ʎ/, /ʃ/, /tʃ/ or /ɲ/, with the velar stops /k/ and /g/ first becoming [j] before the palatalization could occur. Finally, there was a strengthening of some of these phonemes, with /ʎ/ becoming /ʒ/ and intervocalic \widehat{ts} becoming $\widehat{dʒ}$. Table 1 illustrates the changes from Latin that give us the medieval Spanish sibilant phonemes: \widehat{ts} , $\widehat{dʒ}$, /s/ /z/, /ʃ/ and /ʒ/ (Pharies 2007).

Table 1: From Latin to Medieval Spanish sibilant phonemes, adapted from Pharies (2007).

Latin	Vowel Changes ²	[e] in hiatus > [j]	[t] and [k] to \widehat{ts} before [j]	Palatalization	Lenition and Strengthening	Medieval Spanish
<i>puteu</i> /puteu/ ‘well’	[poteo]	[potjo]	[p \widehat{otso}]	N/A	[p $\widehat{odʒo}$]	/p $\widehat{odʒo}$ / <i>pozo</i>
<i>lancea</i> /lankea/ ‘lance’	[lankea]	[lankja]	[l \widehat{antsa}]	N/A	N/A	/l \widehat{antsa} / <i>lança</i>
<i>ossu</i> /ossu/ ‘bone’	[wesso]	N/A	N/A	N/A	[weso]	/ueso/ <i>huesso</i>
<i>rosa</i> /rosa/ ‘rose’	[rosa]	N/A	N/A	N/A	[roza]	/roza/ <i>rosa</i>
<i>apicula</i> /apikula/ ‘bee’	[apekla]	N/A	N/A	[apejla] > [apeʎa]	[aβeʒa]	/abeʒa/ <i>abeja</i>
<i>dīxī</i> /di:ksi:/ ‘he/she said’	[dikse]	N/A	N/A	[dijse] > [diʃe]	N/A	/diʃe/ <i>dixe</i>

² This includes vowel merger and diphthongization of [ɔ] to [we]

These new sibilant phonemes underwent more changes between the thirteenth and seventeenth centuries that give us the modern Spanish phonemes: deaffrication, devoicing and a change in point of articulation. According to Allen (2002), deaffrication started as early as the thirteenth century with the phonemes /t͡s/ and /d͡z/ in intervocalic position becoming dental fricatives, like in the medieval words *lança* /lant͡sa/ → /lança/ and *pozo* /pod͡zo/ → /pozo/; the change spread to all of Castile by the late sixteenth/early seventeenth century to word-final and word-initial position. This deaffrication created a phonemic inventory by which a medieval Spanish speaker had to distinguish between four different sibilants on the basis of voicing (i.e. voiceless ʃ and ʒ vs. voiced ʒ and ʒ) and of two very similar places of articulation (i.e. dental ʃ and ʒ vs. apicoalveolar ʃ and ʒ). Spanish underwent a process of sibilant devoicing beginning in the fifteenth century, with the younger members of the lower class in Northern Spain. Eventually, it spread to all age groups, social classes and geographic areas of the Spain so that by the end of the sixteenth century / ʒ / had merged with / ʃ / (e.g. *pozo* /po ʒ o/ → /po ʃ o/), / ʒ / with / ʃ / (e.g. *rosa* /ro ʒ a/ → and /ro ʃ a/) and / ʒ / with / ʃ / (e.g. *abeja* /abe ʒ a/ → /abe ʃ a/); the only sibilant phonemes that existed by the beginning of the seventeenth century were voiceless.

Finally, to make the distinction between the three sibilant phonemes, / ʃ /, / ʒ / and / ʃ /, even more pronounced there was a change in articulation with either / ʃ / or with / ʒ /, depending on the geographic region. During the mid-sixteenth century in the Northern and Central regions of Spain (i.e. Castile), the dental / ʃ / became even more dental, so much that it became the voiceless interdental fricative / θ / (e.g. *pozo* /po ʃ o/ → /po θ o/), and / ʃ / underwent backing to the velar, or even uvular, voiceless fricative, / x / and / χ / (e.g. *abeja* /abe ʃ a/ → /abexa/ or /abe χ a/), respectively; this distinction between an interdental and apical-alveolar fricative is still present in

the Spanish of Northern, Central and Eastern Spain (including Catalonia), a phenomenon known as *distinción*. In Andalusia, the change in articulation created two different outcomes: *seseo* (the merger of /s̺/ and /s̠/ to a voiceless alveolar fricative /s/) and *ceceo* (the merger of /s̺/ and /s̠/ to a voiceless interdental fricative /θ/) (Allen 112-113). *Seseo* is the phenomenon that the Andalusians brought with them to the New World and that is why today /θ/ is non-existent in Latin America (Morgan 2010). Furthermore, the phoneme /ʃ/ also underwent backing in Andalusia to either /x/ or /h/, a feature that was also transported to the New World. By the mid-seventeenth century all of sibilants had solidified their new place of articulation and this change was present all throughout Spain (Allen 116).

Catalan can be seen as having a more conservative phonology than Spanish because of its tendency to preserve certain vowel and consonant distinctions. For example, in Western Vulgar Latin, stressed vowels suffered a significant change that neutralized vowels, long and short, into a new system of seven vowels (Pharies 81). Today, this system of seven vowels is present in Catalan, /i/, /e/, /ɛ/, /a/, /ɔ/, /o/ and /u/, (Wheeler xxii), while Spanish early on diphthongized the vowels /ɛ/ and /ɔ/ into [je] and [we], respectively, leaving the Spanish vowel inventory with only /i/, /e/, /a/, /o/ and /u/ (Pharies 84). With respect to the sibilants, Catalan has maintained a phonemic inventory that is nearly identical to the medieval Spanish one, with the exception of /t̪s/, which mainly merged with /s/ in most instances except across morpheme boundaries (Hualde 1992). Table 2 summarizes the sibilant history of Spanish and compares it to Catalan.

Table 2: From Latin to (medieval) Spanish and Catalan, adapted from Morgan (2010), Pharies (2007) and Wheeler (1979).

Latin	Medieval Spanish	Deaffrication	Devoicing	Change in Point of Articulation	Modern Castilian Spanish	Modern Catalan
/kaptia/	/katsa/ <i>caça</i> 'hunt'	/kaʃa/	N/A	/kaθa/	/kaθa/ <i>caza</i>	/kasa/ <i>caça</i>
/duodekim/	/doðze/ <i>doze</i> 'twelve'	/doze/	/doʒe/	/doθe/	/doθe/ <i>doce</i>	/doðze/ <i>dotze</i>
/passa/	/paʃa/ <i>passa</i> 'pass'	N/A	N/A	N/A	/paʃa/ <i>pasa</i>	/pasa/ <i>passa</i>
/kasa/	/kaʒa/ <i>casa</i> 'house'	N/A	/kaʃa/	N/A	/kaʃa/ <i>casa</i>	/kaza/ <i>casa</i>
/liksi:wa/	/leʃia/ <i>lexia</i> 'bleach'	N/A	N/A	/lexia/	/lexia/ <i>lejia</i>	/keiʃiu/ <i>lleixiu</i>
/joku/	/ʒuego/ <i>juego</i> 'game'	N/A	/ʃuego/	/xuego/	/xuego/ <i>juego</i>	/ʒok/ <i>joc</i>

1.4 Distribution of /s/ in Catalan and Spanish

From Table 2, it becomes easy to see that Catalan did not undergo deaffrication, devoicing or a change in articulation that to the extent that Spanish did, so that, in terms of its sibilant inventory, modern Catalan looks nearly identical to medieval Spanish. The provided Spanish and Catalan words in Table 2 come from the same Latin word (i.e. the Latin word for 'game,' /joku/, gives us the Spanish /xuego/, *juego*, and the Catalan /ʒok/ *joc*); it is as if the Catalan sibilants did not undergo any more changes after the Middle Ages while Spanish

continued to be the more “innovative” of the two languages. This tendency can also be seen in the distribution of the phoneme /s/ in both Spanish and Catalan. Catalan has maintained the medieval distribution of /s/, because in Modern Catalan /s/ → [z] before a vowel, if /s/ is word final, or before any voiced consonant (Wheeler 1979), while modern Spanish only voices /s/ if it is before a voiced consonant (Morgan 2010). Table 3 compares the distribution of /s/ of Spanish with Catalan, a distinction that will become important later.

Table 3: /s/ distribution differences, adapted from Morgan (2010) and Wheeler (1979)

Segment	Castilian Spanish	Catalan
/s/ + voiceless consonant	/mis patatas/ → [mispatatas] <i>mis patatas</i> /abras katalan/ → [aβlaskatalan] <i>hablas catalán</i> /es fabuloso/ → [esfaβuloso] <i>es fabuloso</i> /los ʃokolates/ → [losʃokolates] <i>los chocolates</i>	/mebes patatas/ → [meβəspətətəs] <i>meves patatas</i> /parles katala/ → [parləskətəla] <i>parles català</i> /es fabulos/ → [esfəβulos] <i>és fabulós</i> /les ʃocolates/ → [ləsʃukulatəs] <i>les xocolates</i>
/s/ + voiced consonant	/es berdad/ → [ezβerðað] <i>es verdad</i> /miras detras/ → [mirazðetras] <i>miras detrás</i> /mis mañanas/ → [mizmaɲanas] <i>mis mañanas</i> /los ɣernos/ → [lozɣernos] <i>los yernos</i> /unos lapiθes/ → [unozlapiθes] <i>unos lapices</i>	/es beritat/ → [ezβəɾitə] <i>és veritat</i> /mires derefe/ → [mirəzðərəfə] <i>mires derrere</i> /meus matins/ → [meuzmətins] <i>meus matins</i> /els ʒendres/ → [ətzʒendrəs] <i>els gendres</i> /uns lapis/ → [unzlapis] <i>uns llapis</i>
word-final /s/ + vowel	/es orible/ → [esorible] <i>es horrible</i> /bes al/ → [besal] <i>ves al</i> /los ultimos/ → [losultimos] <i>los últimos</i> /unas aθiendas/ → [unasaθjeɲdas] <i>unas haciendas</i> /mis eskuelas/ → [miseskwelas] <i>mis escuelas</i>	/es orible/ → [ezuriblə] <i>és horrible</i> /beus al/ → [beuzat] <i>veus al</i> /els ultims/ → [ətzuɾtims] <i>els últims</i> /unes izendes/ → [unəzizeɲdəs] <i>unes hisendes</i> /meus eskoles/ → [meuzəskoləs] <i>meus escoles</i>

1.5 Previous /s/ voicing Research

Despite this seemingly clear distribution of /s/ in Spanish there seems to be a re-emergence of its voiced allophone in intervocalic position in some dialects, something that the prescriptive rules of Spanish would not predict. Torreblanca (1986) is one researcher to have tackled the issue of /s/ voicing on the Iberian Peninsula. Although his study is by no means quantitative, it does provide a good account of the regions of Spain where /s/ voicing has been observed. He noticed that there was a considerable amount of voicing of /s/ and /θ/ to /z/ and

/d͡z/, respectively, in the onset of a syllable, in the Northwestern region of the Toledo Providence (Central Spain). Originally he thought that this was an archaic feature of Spanish but he revised his thinking when he realized that the voicing was happening equally to words that had the old medieval Spanish phoneme /z/ and /d͡z/ as those with /s/ and /ts/. He lists factors such as spontaneous speech and intervocalic position that favor voicing, while prepausal environments disfavor it. After studying this province, he went out to the neighboring ones of Ávila and Cáceres to see if voicing occurred there too; he found that these two regions also voiced /s/ and /θ/ at the syllable onset. He ends his discussion on voicing in Spain by saying that he believes that this is a modern phenomenon, related to articulatory relaxing and not the medieval Spanish sibilant phonemes.

Torreblanca's paper is one of the only papers on /s/ voicing to come out of Spain thus far. The main dialect that has been the focus of /s/ voicing studies in Spanish is that of Ecuador. While on a Fulbright tenure, Robinson (1979) studied intervocalic /s/ voicing in three different contexts: cases where historical /z/ merged with /s/ (e.g. /kaza/ to /kasa/ *casa*), morpheme boundary (e.g. *desayuno*), and word-final /s/ (e.g. *es el*). Although it is possible that /z/ was brought over during the conquest and settlement of the New World, since most of the conquerors were from Andalusia where the /s/-/z/ merger was still in progress, Robinson dismisses the possibility of /s/ voicing as an archaic feature of Spanish. He claims that "while the intact contrast between /z/ and /s/ existed in Ecuador long enough for these loans (/miza/ 'table and /misa/ 'mass') to have passed into Quechua with the archaic voicing, the true contrast has disappeared from all varieties of Ecuadorian Spanish as it has from all other American dialects" (138). Through interviews with local students, Robinson claimed that there were two regions in Ecuador that had cases of intervocalic /s/ voicing: Ibarra to Riobamba (north to center of the

country) and Cuenca. These dialects lack voicing where there was historically a contrast between /s/ and /z/, suggesting that the contrast that was originally brought over from Andalusia is indeed non-existent. However, informants in Cuenca did have intervocalic voicing at both morpheme boundaries and also at word-final /s/; the Ibarra to Riobamba area only had voicing at word-final /s/. One interesting finding was that there were some instances of /s/ voicing before pauses, even when the next segment is a voiceless one (e.g. [ez...tres] *es tres*).

The next researcher to study /s/ voicing in Ecuadorian Spanish was the famous Spanish dialectologist John Lipski (1989). He claims that there is no word-initial /s/ voicing because native speakers can perceive that there is a difference between *has ido* [aziðo] (i.e. word-final) versus *ha sido* [asiðo] (i.e. word-initial) and that word-internal cases of intervocalic /s/ voicing are very rare and restricted to Cuenca, something that Robinson did not find in his data. However, word-final /s/ voicing is not present across all word-final /s/ because it is a variable phenomenon. While Robinson mainly tried to frame his findings in both a historical and phonological context, Lipski mainly focuses on a phonological account for /s/ voicing. He claims that there is a natural tendency in Spanish for syllable-final consonants to undergo changes. For example, in Andalusia, the Caribbean and in Buenos Aires, there is either aspiration or elision of syllable and word-final /s/ and it is well documented that in the Caribbean there is velarization of word-final /n/ and a neutralization of /l/ and /r/ in syllable and word-final contexts. Lipski also mentions Robinson's prepausal /s/ voicing and tries to account for it by pointing out that statistically speaking there is a high chance that the following segment will be voiced, i.e. there are more voiced sounds (stops, nasals, approximants, laterals, the trill and vowels) than voiceless ones (stops, fricatives and affricates); so, the speaker voices the final /s/ in anticipation that the next segment will be voiced.

Although these studies were very informative and the first ones to document /s/ voicing in Ecuador, they relied on the researcher's perception and interpretation of what they were hearing. In order to combat this bias, García (2011) used acoustic analysis to take her native English perceptions of [s] and [z] out of the equation and let the waveforms and spectrograms tell her where /s/ voicing was occurring in the Spanish of Loja, Ecuador. Her results further document what Robinson and Lipski also found, that /s/ voicing is most likely to happen word finally (20% of all word-final /s/ tokens were voiced). What was surprising about her study was that 13.5% of all word-initial /s/ tokens were voiced, something that Lipski did not believe was possible at all. Although these numbers are low, they "go against" the prescriptive rules of Spanish, which states that /s/ is only voiced before voiced consonants. García's study also set out to describe factors, both internal and external, that favor /s/ voicing; she found that intervocalic position, mode, gender, stress and speaker were the most important factors. However, she pointed out that greatest variation when it comes to /s/ voicing is the individual speakers themselves, since some speakers voice categorically in certain intervocalic contexts and not in others.

Chapter 2: Methodology

2.1. Participant Distribution

Thirty-three interviews were conducted in Catalonia between August and September 2011, but due to excessive background noise that interferes with the acoustic analysis only sixteen of the interviews will be used in this study. Of the sixteen participants, the researcher personally knew six of them, two of them were recruited through these known participants and the remaining eight were recruited off of the street. In order to be a participant for this study, participants need to meet three criteria: (1) the participants be at least eighteen years of age; (2) have been born in Catalonia; and (3) be bilingual in Spanish and Catalan. Although it would have been interesting to study the Spanish spoken in Catalonia by immigrant, non-Catalan speaking Spaniards (to see if being surrounded by Catalan had some impact on their Spanish), I decided to study only bilinguals to show that their Catalan, at some level or another, was influencing their Spanish. Furthermore, I wanted only to interview native Catalonians because the interview questions were tailored to those who were born in Catalonia, e.g. questions about Catalanian traditions and politics.

There was an equal number of male and female participants, with eight males and eight females. As it was difficult to recruit older participants, the age range is very skewed towards twenty and thirty year olds, with six informants in the 20 to 29 years-old age range, eight in their thirties and two in their forties. The informants were evenly distributed geographically in that half were from Barcelona province and the other half were from the other three provinces of Catalonia (four from Tarragona, two from Girona and two from Lleida). Finally, eleven of my informants claimed to use Catalan more than Spanish in their personal lives (henceforth, “Catalan dominant”); two use Spanish more than Catalan (henceforth, “Spanish dominant”); and

the remaining three claim to use both languages equally in their personal lives. The socioeconomic status of the participants is not of interest to this study, although they would all probably fall into the middle class.

The demographic information of the sixteen participants is presented in Table 4 and a map of Catalonia is provided in Figure 1. The number in the gender column refers to the speaker number that was assigned to each of the original 33 participants.

Table 4: Participant Demographics (gender, age, residence and habitual language of use)

Gender	Age	Residence	Language
M1	28	Tarragona	Catalan
M3	39	Barcelona	Spanish
M6	31	Barcelona	Both
M7	29	Tarragona	Both
M11	28	Lleida	Catalan
M14	20	Barcelona	Spanish
M16	28	Girona	Catalan
M17	38	Barcelona	Catalan
F4	27	Tarragona	Catalan
F5	34	Barcelona	Both
F6	48	Lleida	Catalan
F7	30	Girona	Catalan
F10	39	Barcelona	Catalan
F11	49	Barcelona	Catalan
F17	32	Tarragona	Catalan
F18	36	Barcelona	Catalan

Figure 2: Map of Catalonia³



2.2 The Interview Format

Each interview consisted of two parts: the first part was a sociolinguistic interview and for the second part the participants were asked to read a paragraph created by the researcher. All the interviews were recorded with a Tascam DR-05 digital audio recorder and the researcher tried his best to make the atmosphere as informal as possible. The interviews took place either at the participant's house or a local café, whichever the participant preferred. Before each interview, the researcher read from the verbal consent form according to the protocol approved

³ "Map of Catalonia." [Online image] Available at

<http://wineandvinesearch.com/spain/catalonia.php>, December 30, 2011

by the Institutional Review Board (2011B0235) on July 13, 2011. The participants were also informed that their recordings could be used in future studies. The research team decided to use verbal consent instead of written consent in order to keep the interview informal, with the hopes that the participant would be as comfortable as possible. Copies of the verbal consent script, interview questions and the reading paragraph are provided in the appendix in both Spanish and English.

The first part of the sociolinguistic interview started with the demographic questions found in Table 4, along with starter questions about the participant's childhood. The interview then moved into questions about Catalan traditions, politics and identity; these questions were chosen in the hope that the informant would forget that s/he was being recorded, allowing the researcher to overcome the "observer's paradox" and elicit spontaneous speech. This part of the interview lasted anywhere from twenty to forty minutes because it depended entirely on how much the participant wanted to talk.

The interview concluded with a reading paragraph created by the researcher in order to maximize the total number of possible /s/ voicing tokens. The paragraph contained five different types of possible /s/ voicing tokens: word-initial intervocalic (e.g., *yo soy el turista serio*); word-final intervocalic (e.g., *que ves en las antiguas plazas*); Spanish cognates that are pronounced as /z/ in Catalan (e.g., Sp. *museo* /museo/, Cat. *museu* /muzeu/); Spanish cognates that are also /s/ in Catalan (e.g. Sp., *pasamos* /pasamos/, Cat. *passem* /pasem/); and the Vs#sV structure (e.g., *novecientos seis*). Although Catalan only voices intervocalic /s/ word-finally, the other four contexts were included to see if there would be any voicing, especially with the /s/ Spanish cognates that are /z/ in Catalan, i.e. are the bilinguals keeping the Catalan phonemic contrast of /s/ and /z/ separate from their Spanish? The paragraph was edited by the project advisor and a

native Castilian Spanish speaker for grammar and readability. Overall, the reading paragraph contained 19 word-initial tokens; 44 word-final tokens; 29 /s/ in Spanish but /z/ in Catalan tokens; 12 /s/ in Spanish and Catalan tokens; and 5 Vs#sV tokens. After the participant finished the paragraph the researcher concluded the interview by thanking the participant for their time and provided them with a information sheet that contained the e-mail addresses of the researcher and the researcher's advisor, should they have any further questions about the study, and the phone number for Ohio State's Office of Responsible Research Practices.

2.3 Quantitative Data Analysis

The reading paragraph of all sixteen participants and part of the sociolinguistic interview of twelve of the participants were analyzed for /s/ voicing. Only twelve of the participants were analyzed for the sociolinguistic interview due to excessive background noise that could not be removed for four of the sixteen participants (although their reading of the paragraph was not affected by the ambient noise because they all moved closer to the microphone, cancelling out the background noise). The sixteen participants were chosen because they were representative of the overall thirty-three participants interviewed, in terms of gender and province of origin; furthermore, the only two participants to self-identify as Spanish speakers and three participants who use both languages equally were also included to try to get a more diverse range of language use.

An equal number of tokens from both the reading paragraph and the sociolinguistic interview were taken from twelve of the participants, i.e. if 101 tokens were analyzed from the reading paragraph then 101 tokens were analyzed from the sociolinguistic interview; for the other four participants only their reading paragraph was analyzed. Every participant had a

different number of tokens elicited from the reading paragraph due to background noise or individual pauses (which are not part of the analysis for this study). The acoustic analysis of the sociolinguistic interview began with the question asking the participant about two Christmas traditions that are uniquely Catalan, roughly seven to ten minutes into the interview, until after the participant answered the question about whether they would like to see Catalonian independence from Spain; overall, this was about six to eleven minutes of the total interview. I chose to start at this part of the interview instead of the very beginning in order to give the participant some time to open up to me, or at the very least be comfortable with the format of the interview. Once the number of tokens from the sociolinguistic interview equaled the reading paragraph's total tokens the analysis of that particular participant was stopped, although there will be additional analysis of one of the participant's sociolinguistic interview that is not included in the overall analysis. If the number of tokens from the Christmas tradition question to the end of the sociolinguistic interview did not equal the reading paragraph total then the tokens from subsequent questions were included in the analysis. Overall, 2714 tokens were analyzed in this study, 1168 tokens from the spontaneous speech portion and 1546 tokens from the reading paragraph.

To analyze the tokens I used the software program WaveSurfer to measure the percent voicing of each possible /s/ voicing token. To do this, I used the spectrogram and waveforms to first measure the duration of the fricative by determining when the shape changed from a vowel to frication. I then ended the measurement when the shape changed back into a vowel, since I am only looking at /s/ in an intervocalic position. The voicing bar was the main cue for the presence or absence of voicing, although I did take into consideration the shape of the waveform if the voicing bar was not present, with a more periodic wave indicating voicing (which proved to be

very useful in many cases). To determine the percent voicing I divided the duration of the voicing by the total frication duration (in ms), times 100; all tokens were rounded up to the nearest whole percent, with .5 and above being rounded up. If there was a break in the voicing bar, or in the periodic wave, in the case of an absent voicing bar, before becoming voiced again I added up the individual voicing components to arrive at the duration of voicing (an example of this is provided in Figure 6). Finally, I grouped the tokens in groups of ten, starting with 0 to 10, then 11 to 20, etc. For further analysis and discussion, the tokens were divided into three categories, following the approach taken by Campos-Astorkiza (2011): tokens with 0% to 20% percent voicing were deemed ‘voiceless’; 21% to 90% ‘partially voiced’; and 91% to 100% ‘fully voiced.’ I wrote down the context for each possible /s/ voicing token for the sociolinguistic interview for later analysis of the intervocalic context. Figures 3-5 show representative examples of voiceless, partially voiced, and fully voiced tokens, taken from the reading paragraph section of the interview; the /s/ tokens are highlighted in order to see the total duration of the frication.

Figure 3: Voiceless /s/ token, 0% voicing, from F7, *paşamos*

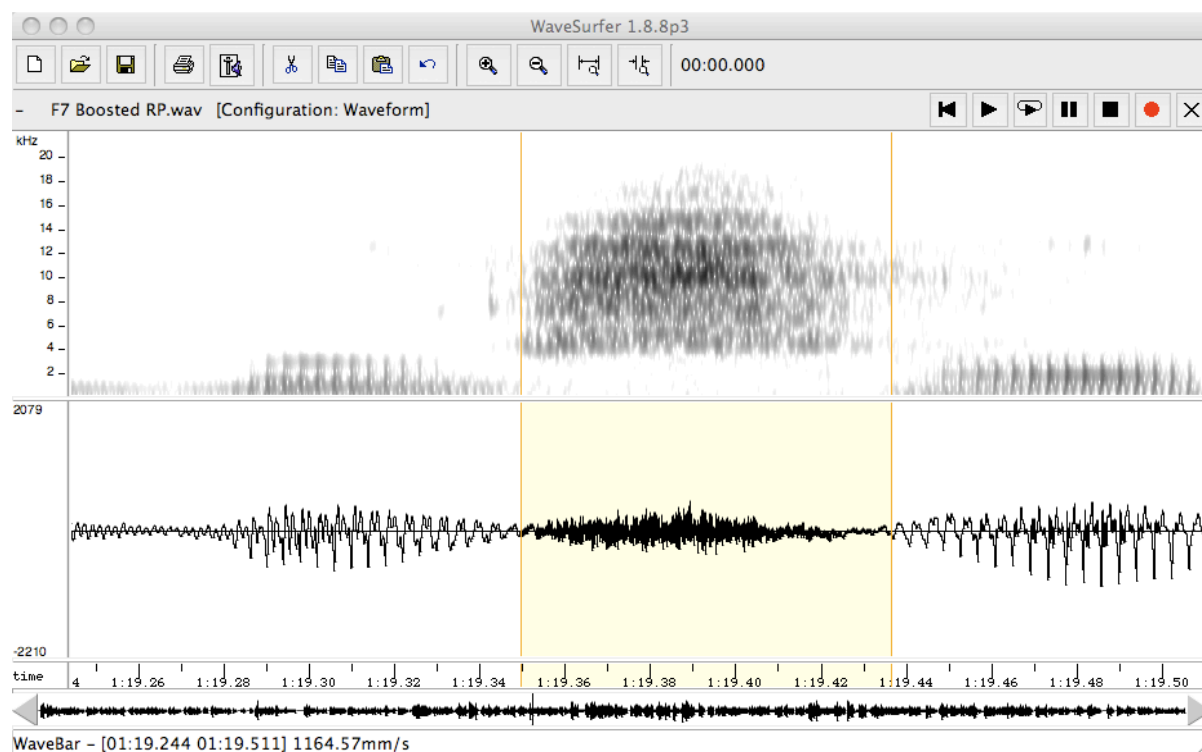


Figure 4: Partially Voiced token, 42%, taken from M7, *inluşo*

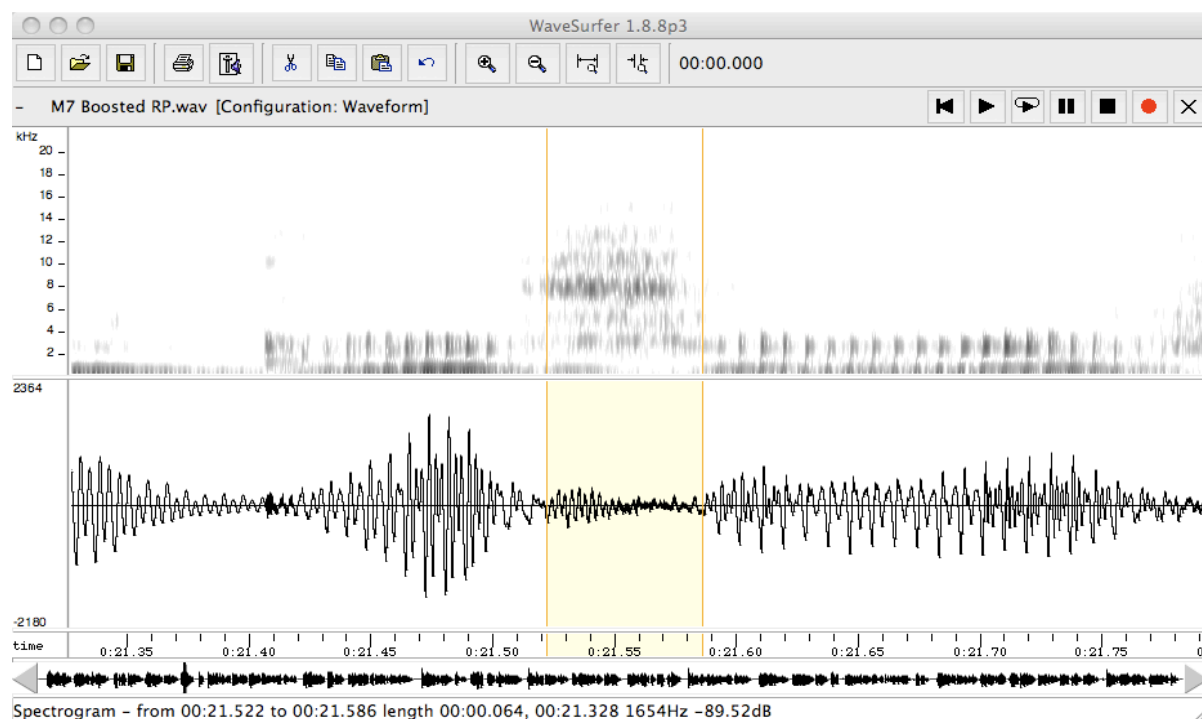


Figure 5: Fully Voiced token, 100%, taken from M17, *unos hechos*

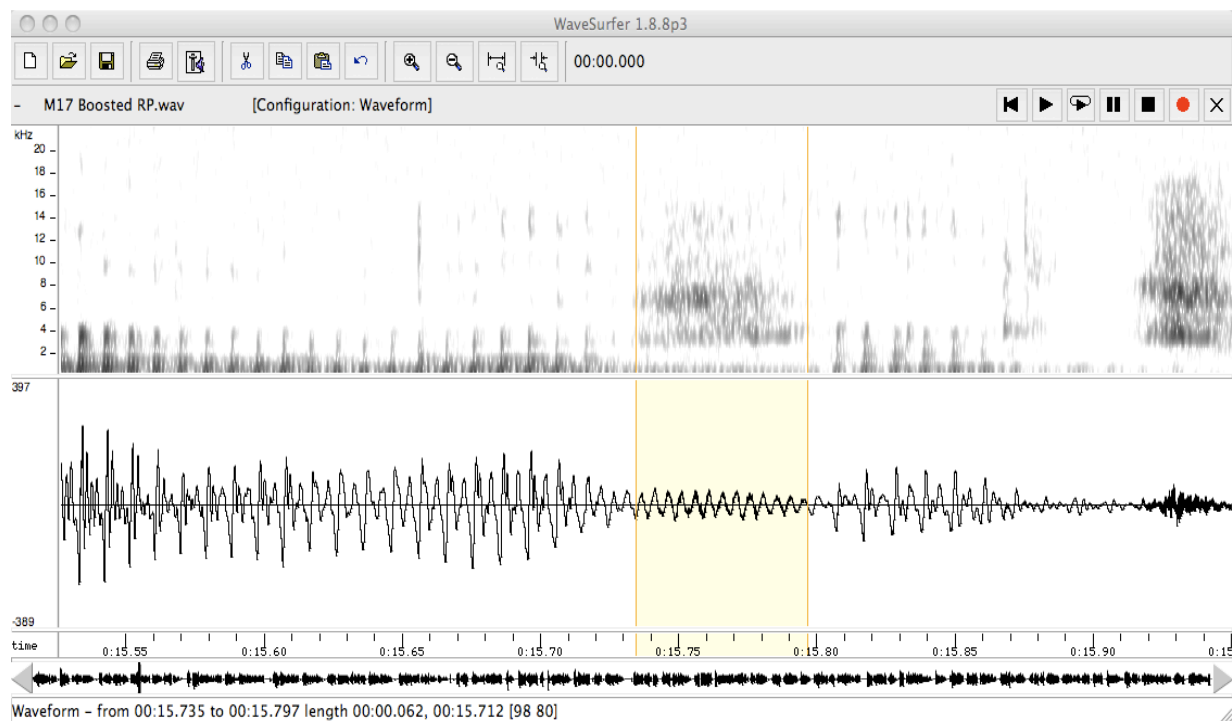
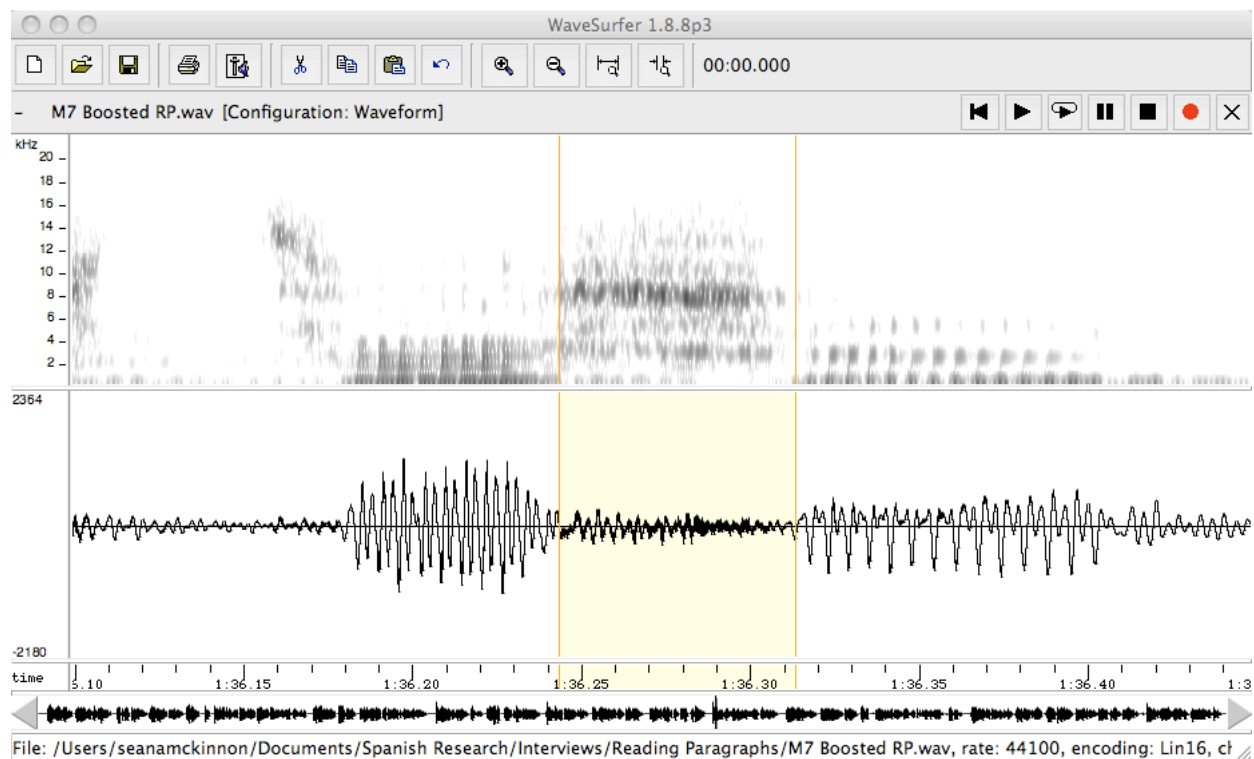


Figure 6: Break in voicing, 33%, taken from M7, *es un*

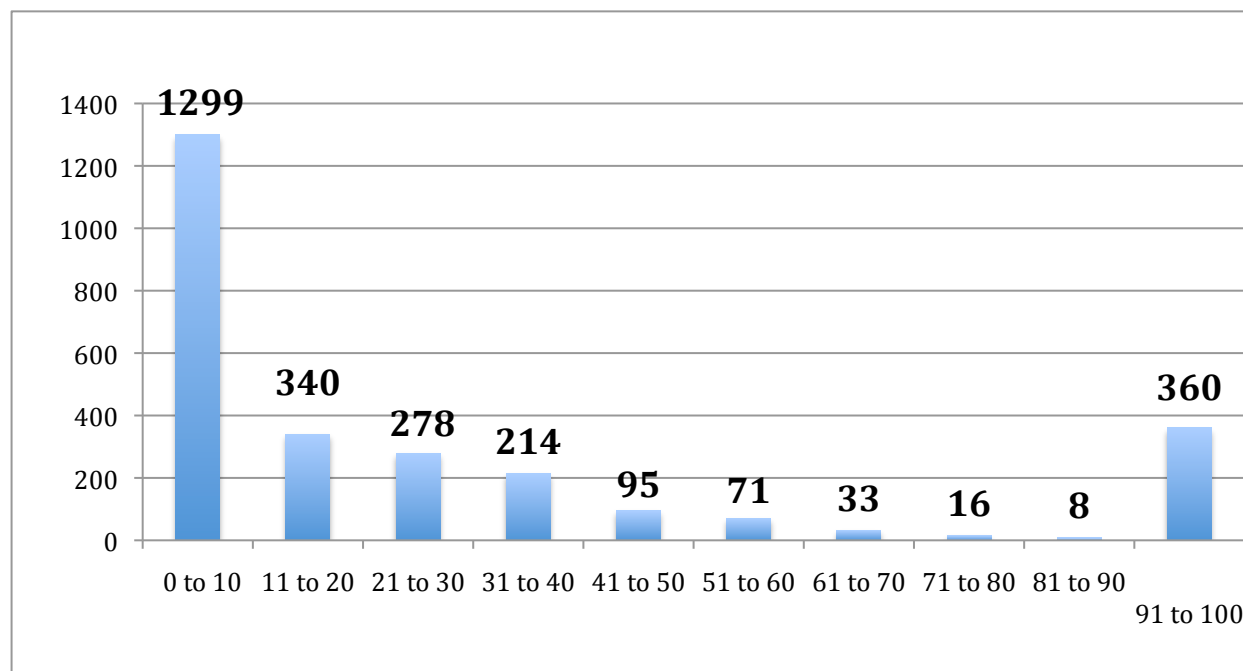


Chapter 3: Results and Analysis

3.1. Data Distribution

The bar graph of percent voicing from both parts of the interview are presented in Figure 6. One clear trend from the data is that there is a gradual decline from 11 to 20 percent voicing to 81 to 90 percent voicing before increasing again with the 91 to 100 percent voicing tokens; García (2011) found a nearly identical situation with her data in the Spanish of Loja, Ecuador. Although the majority of tokens would be classified as voiceless, 360 tokens (13.3% of the data) are fully voiced, something that the /s/ distribution of Spanish would neither predict nor allow.

Figure 7: Bar graph of Overall Percent Voicing (x-axis = percent voicing, y-axis = # of tokens)



One interesting finding from the data is the amount of partially voiced tokens. One might expect some voicing due to influence from the preceding vowel (which is why this study deems

up to 20% voicing as still “voiceless”) or the token to be fully voiced, i.e. the token would either be voiceless or fully voiced. However, the data tell a different story, with a full quarter of the tokens being partially voiced. This demonstrates that not only is there variability between voiceless and voiced tokens but there is also variability between the percent voicing, something that not only varies between participants but also within the speech of the same participant. That is to say that /s/ voicing in Catalanian Spanish is not predictable; although certain (socio)linguistic contexts favor or disfavor it, /s/ is never exclusively voiceless or voiced in intervocalic position. This supports other findings with /s/ voicing research, like Lipski (1989) who claimed that /s/ voicing in Ecuadorian Spanish is also a variable phenomenon.

The intervocalic context of the /s/ token appears to play a factor as to whether it will be voiced or not. It is clear from Table 5 that the only context to favor fully voiced tokens is word-final; in fact, a word-final /s/ token is more likely to be partially voiced or fully voiced than it is to be voiceless (a combined 55.5% for partially and fully voiced versus 44.4% for voiceless). Furthermore, this result also supports García (2011), who found that /s/ voicing was more likely to occur in word-final position than word-initially or word-internally. The other four contexts of this study all have very low levels of fully voiced tokens, ranging from 4.9% for Spanish /s/ where the Catalan cognate has /z/, to only two fully voiced tokens for the Vs#sV structure. One thing that is surprising from the data is the relatively moderate level of partially voiced tokens in every linguistic context, especially with the Vs#sV structure, which has 31.3% of its tokens partially voiced. Finally, a chi-square analysis reveals that the intervocalic context is indeed a statistically significant ($p < 0.0001$) factor in /s/ voicing; table 5 shows the comparison of voicing with the intervocalic contexts.

Table 5: Intervocalic Context with the Tokens (chi-square = 390, $p < 0.0001$)

Intervocalic Context	Voiceless	Partially Voiced	Fully Voiced	Total # of Tokens
Word-initial	477 (71.0%)	176 (26.2%)	19 (2.8%)	672
Word-final	462 (44.4%)	277 (26.6%)	301 (28.9%)	1040
/s/ in Spanish but /z/ in Catalan	405 (68.0%)	162 (27.2%)	29 (4.9%)	596
Both /s/ in Spanish and Catalan	218 (74.9%)	64 (22.0%)	9 (3.1%)	291
Vs#sV	77 (67.0%)	36 (31.3%)	2 (1.7%)	115
Total # of Tokens	1639 (60.4%)	710 (26.3%)	360 (13.3%)	2714

The last linguistic factor to be considered is the mode of the interview. Recall that the interview consisted of a sociolinguistic interview that elicited spontaneous speech and a reading paragraph that can be described as careful speech. From the raw counts, we can see that there are both more partially and more fully voiced tokens in the spontaneous speech portion than in careful speech. Since these numbers are fairly close to each other we will have to look at the binary analysis to give us a more accurate picture, however the results are statistically significant ($p < 0.0001$). Table 6 shows the mode of the interview with the tokens.

Table 6: Mode with the Tokens (chi-square = 42.7, $p < 0.0001$)

Mode	Voiceless	Partially Voiced	Fully Voiced	Total # of Tokens
Spontaneous	623 (53.3%)	357 (30.6%)	188 (16.1%)	1168
Careful	1016 (65.7%)	358 (23.2%)	172 (11.1%)	1546
Total # of Tokens	1639 (60.4%)	710 (26.3%)	360 (13.3%)	2714

Before we can discuss the sociolinguistic factors, it would be helpful to present the individual raw tokens from each of the participants in Table 7.

Table 7: Raw Counts

Participant	Voiceless	Partially Voiced	Fully Voiced	Total # of Tokens
M1	163	26	21	210
M3	118	59	21	198
M6	95	83	18	196
M7	119	45	23	187
M11	93	61	46	200
M14	78	7	2	87
M16	93	3	0	96
M17	111	33	48	192
F4	141	59	6	206
F5	83	67	44	194
F6	71	80	51	202
F7	167	17	4	188
F10	58	69	45	172
F11	42	41	12	95
F17	54	23	10	87
F18	153	42	9	204

From this table we can see that the distribution of fully voiced among the participants is not even at all, i.e. the majority of them either have a lot of voiced tokens or just a few; M11, M17, F5, F6 and F10 all have more than 40 fully voiced tokens, while F4, F7 and F18 all have less than 10 fully voiced tokens. It is important to note that the speakers with more than 40 fully voiced tokens are self-identified Catalan speakers, which may be their dominant language, a distinction that will be important in Chapter 4.

As previously mentioned, the sociolinguistic factors that will be considered for this study are gender, language use and province of origin; age will not be considered here because the distribution of age is not representative. Since I was not able to get enough participants from each of the four provinces, besides Barcelona, I will be collapsing the category to from Barcelona and outside of Barcelona, i.e. Tarragona, Lleida and Girona. The raw counts of the tokens lead to some interesting and surprising results, and each sociolinguistic factor was statistically significant at the $p < 0.0001$ level (except gender which was significant at $p < 0.0005$); table 8 outlines these results.

Table 8: Sociolinguistic Factors with the Tokens, (gender chi-square = 15.3, $p < 0.0005$; language use chi-square 34.1, $p < 0.0001$; province chi-square = 30.3, $p < 0.0001$)

Sociolinguistic Category	Factor	Voiceless	Partially Voiced	Fully Voiced	Total
Gender	Male	870 (63.7%)	317 (23.2%)	179 (13.1%)	1366
	Female	769 (57.0%)	398 (29.5%)	181 (13.4%)	1348
Language Use	Spanish	196 (68.8%)	66 (23.2%)	23 (8.1%)	285
	Both	297 (51.5%)	195 (33.8%)	85 (14.7%)	577
	Catalan	1146 (61.9%)	454 (24.5%)	252 (13.6%)	1852
Province	BCN	738 (55.2%)	401 (30.0%)	199 (14.9%)	1338
	Outside BCN	901 (65.5%)	314 (22.8%)	161 (11.7%)	1376

For gender, it appears that males and females do not differ in the amount of fully voiced tokens, but they do for the partially voiced tokens which subsequently affects their amount of

voiceless tokens; females tend to have more partially voiced tokens than males which causes them to have a low level of completely voiceless tokens. Not surprisingly, the data shows that Spanish speakers have low levels of fully voiced tokens, although it is important to note that these speakers did exhibit nearly the same percent of partially voiced tokens as the Catalan speakers. Speakers who claimed to use both languages equally show about the same percent of fully voiced tokens as the Catalan speakers, although the former showed a higher percentage of partially voiced tokens; in fact, the speakers who use both languages equally had nearly half of all their tokens either partially or fully voiced (48.5%), while the Catalan speakers only had 38.1% of their tokens either partially or fully voiced. It is also important to mention that the percent of fully voiced tokens for the Catalan speakers may be a bit misleading, since it is the average of the entire group; table 7 showed us that some Catalan speakers had over 40 fully voiced tokens while others had only a few. Finally, it appears that speakers from the Barcelona province are voicing, both partially and fully, more than their counterparts from Catalonia's three other provinces. Although these raw numbers, percents and chi-squares outline the overall trend to the data it is important to use multivariate analysis to determine if any of these factors are favor voicing.

3.3. Binary Analysis

A multivariate analysis was performed on the software program GoldVarb, through a logistic regression model. The application value was voicing, i.e. partially and fully voiced tokens were collapsed into one category. I decided to merge these two categories together for two reasons: 1) a binary analysis does not allow analysis of three variants; 2) I am mainly interested in how the Catalanian Spanish /s/ distribution differs from its standard Spanish

counterpart, so as long as there is more than 20% voicing the token does not follow the normative rules of Spanish for /s/ and therefore is significant to the goals of this study.

However, to further solidify my results I also ran a multivariate analysis for only fully voiced tokens, with the voiceless and partially voiced tokens forming one group. The table (Table 9) shows the results of the multivariate analysis, while only differences from the different application values are presented in Table 10.

Table 9: Results from the GoldVarb binary analysis of voicing (app value = voicing)

	Factor Weight	% Voiced	Total N	% Data
<u>Position</u>				
Word Initial	0.35	29	672	25
Word Final	0.67	56	1040	38
/s/ Span; /z/ Cat	0.45	32	596	22
/s/ Span and Cat	0.35	25	291	11
VssV	0.38	33	115	4
<u>Mode</u>				
Spontaneous	0.58	47	1168	43
Reading	0.44	34	1546	57
<u>Gender</u>				
Male	0.48	36	1366	50
Female	0.53	43	1348	50

<u>Language Use</u>				
Spanish	0.38	31	285	11
Both Equally	0.59	49	577	21
Catalan	0.49	38	1852	68
<u>Province</u>				
Barcelona	0.57	45	1338	49
Outside Barcelona	0.43	35	1376	51
N = 2714 Output = 0.384				

The results from the binary analysis confirm some of the trends in the raw counts. Word-final /s/ heavily favors voicing, while the other intervocalic contexts disfavor it; in fact, there is a huge difference between the factor weights of word-final /s/ (0.67) and the next closest intervocalic context, /s/ in Spanish but /z/ in Catalan with a factor weight of 0.45. Not surprisingly, spontaneous speech favors voicing, perhaps suggesting that the participants are aware that their Catalan influences their Spanish and hence attempt to “control” it when reading. Women seem to slightly favor voicing over men, but both factor weights are so close to 0.50 that the effect seems to be minimal at best; this was to be expected as the chi-square analysis for this factor had $p < 0.0005$, while every other factor group had $p < 0.0001$.

Participants from the Barcelona province favor voicing more than their counterparts from the other three provinces of Catalonia. The most interesting result from the binary analysis is that participants who claim to use both Spanish and Catalan equally tend to favor voicing, while self-identified Catalan speakers, as a group, disfavor voicing ever so slightly (0.49); not surprisingly, those self-identifying as Spanish speakers strongly disfavor voicing. One would expect the self-identified Catalan speakers not only to have the highest percentage of fully voiced

tokens but also to strongly favor voicing. However, the binary analysis confirms what was shown in Table 8; although the Catalan and Spanish/Catalan speakers did not differ in the number of fully voiced tokens, they did differ in the number of partially voiced tokens, with the Spanish/Catalan speakers having more, which is why the binary analysis shows they favor voicing more than Catalan speakers.

As previously stated, to make sure that the grouping of partially and fully voiced tokens in the binary analysis did not “pad” the results, I ran another binary analysis with the voiceless and partially voiced tokens in the same category. Table 10 compares the results of this analysis with the previous one in Table 9; the application value for this run was fully voiced tokens.

Table 10: Comparison of the Goldvarb binary analyses (app value 1 = voicing, app value 2 = fully voiced tokens)

	Factor Weight 1	Factor Weight 2
<u>Position</u>		
Word Initial	0.35	0.22
Word Final	0.67	0.82
/s/ Span; /z/ Cat	0.45	0.39
/s/ Span and Cat	0.35	0.28
VssV	0.38	0.17
<u>Mode</u>		
Spontaneous	0.58	0.57
Reading	0.44	0.45

<u>Gender</u>		
Male	0.48	Not Significant
Female	0.53	Not Significant
<u>Language Use</u>		
Spanish	0.38	0.29
Both Equally	0.59	0.52
Catalan	0.49	0.54
<u>Province</u>		
Barcelona	0.57	0.58
Outside Barcelona	0.43	0.43

The change of the application value to fully voiced tokens from voicing does not dramatically alter the results from the first binary analysis. Both the mode and the province factors did not change at all when the application value was changed. Furthermore, the second binary analysis provided more evidence that the only intervocalic context that favors any kind of voicing, whether it is fully voiced or a combination of fully and partially voiced tokens, is word-final position, with the second run augmenting considerably the high factor weight (0.82). Just how the first run showed that gender was not an important factor in voicing, the second run did not even consider the factor group of gender to be significant. Finally, the application value of fully voiced tokens shows that Catalan and Catalan/Spanish speakers both favor voicing, once again demonstrating that the two groups only differ on the amount of partially voiced tokens but not fully voiced ones.

Chapter 4: Discussion and Conclusions

One of the main purposes of this study was to document that /s/ voicing in Catalanian Spanish does indeed exist. The overall raw numbers for the data show that 13.3% of the tokens are fully voiced, while another 26.3% are partially voiced; together, almost 40% of the tokens collected in this study do not conform to the “standard” /s/ distribution of Spanish that states that [z] is only found before voiced consonants. Furthermore, every participant except one had at least one fully voiced token, suggesting that most, if not all, Catalanian Spanish speakers are fully capable of intervocalically voicing their /s/. None of the participants in this study were aware of intervocalic /s/ voicing in their Spanish. Only one participant was aware that /s/ is sometimes problematic for Catalans speaking Spanish; “las eses las hacemos también distintas; yo creo que lo que más nos cuesta a los catalanes es hacer las eses” (M16) (‘the s’s we also do differently; I think what is hardest for us Catalans is to do the s’s right’). Interestingly enough, M16 was the participant who did not produce a single fully voiced token.

Since the data show that /s/ voicing is indeed a real phenomenon in Catalanian Spanish we should now turn our attention to possible explanations for why it occurs. I will examine three possible hypotheses for /s/ voicing: it is a remnant of the Spanish brought to Catalonia by the Castilians (historical influence), the environment of intervocalic /s/ promotes its voicing (phonetic), and Spanish/Catalan bilinguals are imposing their Catalan phonology on their spoken Spanish (contact-induced change).

As mentioned in Chapter 1, Spanish used to have a phonemic contrast between /s/ and /z/, so that *caça* /kasa/ ‘hunt’ and *casa* /kaza/ ‘house’ were perceived as two different words. Robinson (1979) also states that /s/ → [z] intervocalically in medieval Spanish for prefix and word-final /s/; these [z] contexts were also lost during the Spanish sibilant devoicing of 15th and

16th centuries so that today we only find [z] before voiced consonants. So, it might be possible that the Spanish spoken in Catalonia is just a remnant of the medieval Spanish brought to Catalonia and that this area did not undergo sibilant devoicing like the rest of Spain. However, according to Vila-Pujol (2007), Spanish first arrived to Catalonia in the early fifteenth century when a few Castilian aristocrats came to live in Barcelona. Since there were very few of these aristocrats, Spanish was limited to the upper class of Catalonia, with the rest of the population continuing to speak Catalan. This trend continued when the Kingdoms of Aragon (which included all the Catalan-speaking territories) and Castile were united under Ferdinand and Isabella, although noblemen and other prestigious social classes (e.g. clergy, teachers and clerks) also began to learn Spanish. The use of Spanish finally spread to all social classes beginning in the sixteenth and seventeenth centuries with the rise of Castilian power in Europe and overseas. Spanish finally became consolidated in Catalonia by the eighteenth century when Catalonia found itself on the losing side of the Spanish War of Succession. However, as previously mentioned, the devoicing of Spanish sibilants began in the fifteenth century with the lower class and youth of Castile and the change was solidified by the end of the sixteenth century. So while it is entirely possible, and probable, that the Spanish first spoken in Catalonia, i.e. the Spanish of the Catalan aristocracy, contrasted between voiced and voiceless sibilants and had the old medieval distribution of /s/, Spanish was not widely spoken in Catalonia until the eighteenth century, a full two centuries after devoicing occurred. Therefore, it is not possible that /s/ voicing in Catalonian Spanish is due to the Spanish brought to Catalonia by the Castilians.

Spanish, like other Romance languages, has had a long history from Vulgar Latin to its medieval form, which included the voicing of previously voiceless consonants. This was a very common occurrence intervocally; according to Pharies (2007), in Spanish the non-geminate

Latin stops /p/, /t/, /k/ became voiced to /b/, /d/, /g/, respectively. Furthermore, before the Middle Ages the Latin phonemes /s/, /t̃s/, and /f/ all became voiced to /z/, /d̃z/, and /β/ in the same position. From these examples, we can see that throughout the history of the Spanish language it is easy to find instances of stops and fricatives becoming voiced when they are in an intervocalic position, even if some of them later became devoiced. It is possible that Catalanian Spanish is going through another historical cycle of lenition, since the phonetic environment of VsV naturally favors voicing. However, if it were the phonetic environment of /s/ between two vowels then we would expect to see little to no difference between any of the intervocalic contexts, i.e. in addition to reclaiming the old medieval distribution of /s/ we would also expect to see some word-internal /s/ voicing. However, the data do not support this hypothesis because the only intervocalic context that favors voicing is word-final /s/; the two word-internal contexts (/s/ in Spanish but /z/ in Catalan and /s/ in both languages) have a combined 38 fully voiced tokens (1.4% of the overall data), so not surprisingly, these two factors disfavor voicing in both binary analyses.

Since it is not the intervocalic position that is driving /s/ voicing we will turn our attention to the last possible hypothesis; this phenomenon is a result of contact-induced change. According to Winford (2003), there are three broad types of contact situations, involving language maintenance, language shift, and new language creation, though there is overlap among the three. We will focus on language maintenance, “preservation by a speech community’s native language” (11), and language shift, which is when a community adopts another language that leads to “the partial or total abandonment of a group’s native language; [...] in some cases, the shift results in successful acquisition of the target language, with little or no influence from the native language of the shifting group” (15). In the case of Catalonia, Vila-Pujol (2007)

asserts that language shift from Catalan to Spanish began with the upper class seeking to advance in Castilian society and finally with the middle and lower class after Catalonia was on the losing side of the Spanish War of Succession, between 1701-1713. The New Plant Decree implemented by the central Castilian government banned Catalan, which in turned created a diglossic situation by which Catalan was the colloquial language and Spanish was used in formal situations. Furthermore, with the rise of Catalonia as an industrial power in nineteenth century there was a flood of Spanish immigration to Catalonia looking for work and as a result Spanish became the medium of communication between native Catalans and these Spanish immigrants. Although there was a brief period of Catalan re-emergence during the Second Spanish Republic, Catalonia and its native language were once again repressed under the dictator Francisco Franco from 1939 to 1975. There was another wave of immigration to Catalonia during Franco's regime and this again promoted the use of Spanish at the expense of Catalan; Woolard (1990) states that "the policies of the Franco dictatorship [were] successful in getting generations of Catalans to learn and use Castilian (although not abandon Catalan)" (314). However, as noted by Vila-Pujol (2007), this was only a partial abandonment of the Catalan language because "bilingualism still existed, especially in the cities. Spanish, however, became the institutional language, and the language of formal situations, education, and the media. Catalan was still much used in the familiar contexts among country folk as well as among the rural and urban middle classes" (63), i.e. language maintenance. This history of political repression and suppression of the Catalan language set the stage for a language shift in Catalonia, from Catalan to Spanish.

One common result of language shift is the incorporation of elements of one's native language into the target language. Second language acquisition researchers and language teachers commonly refer to this "interference" or "transfer," but some contact linguists refer to

this phenomenon as ‘imposition.’ Van Coetsem (1988) coined this term in his book on loan phonology and it is a good framework to examine /s/ voicing in Catalanian Spanish. He describes imposition by stating: “in this transfer type the source language speaker [where the innovative feature comes from] is active and the adaptation of the recipient language [the language which receives the innovative feature] to the source language takes place” (11). Imposition can arise from either a situation of prestige or need in the linguistic community, depending on if the source language is linguistically dominant (i.e. the native language of the person/community). In the case of Catalanian Spanish, the source language is Catalan, because that is where the innovation (i.e. the voicing contrast) comes from, and Spanish is the recipient language because it receives the voicing contrast. The informants who use voicing in their production of /s/ are Catalan-dominant, which suggests that the voicing is due to imposition, i.e., the use of Catalan articulatory habits in producing Spanish. Indeed, this is what Van Coetsem had in mind when he stated that imposition “occurs, for instance, when a native speaker of French (the *sl*) is using English (the *rl*) and pronounces a word like *pit* as [pit], instead of [p^hɪt], applying the French values [p] and [i] instead of English [p^h] and [ɪ]” (11).

This assertion is backed up from the sociolinguistic data collected in this study. The participants who claim to be primarily Catalan speaking favor fully voicing /s/ with a factor weight of 0.54, according to the binary analysis. On the other end of the spectrum, the Spanish speakers, who would claim that Spanish is their native language although they proficiently speak Catalan, strongly disfavor voicing (0.38) and fully voicing /s/ (0.29). The participants who claim to use both languages equally favor voicing (0.59) but favor fully voicing /s/ at less of a factor weight than the Catalan speakers (0.52 vs. 0.54).

However, the participants who either use Catalan or both languages equally are only imposing one phonological rule onto their Spanish when it comes to /s/, and that is the distribution of /s/. Recall that Catalan not only has a phonemic distinction between /s/ and /z/, e.g. /kaza/ ‘house’ vs. /casa/ ‘hunt,’ but also a distribution of /s/ that calls for /s/ to be voiced word-finally if followed by a voiced segment (including, crucially, a vowel): /s/ → [z] / _ # [+voiced]; that is to say that the voicing of word-final /s/ can be used as a morpheme marker. This marker helps Catalan speakers distinguish *unes sàvies* [unəsaβjəs] ‘some wise women’ and *unes àvies* [unəzaβjəs] ‘some grandmothers’ (Arnal 2011), while it does not exist in Spanish, e.g. *ha sido* [asiðo] ‘it has been,’ and *has ido* [aziðo] ‘you have gone.’ Therefore, the participants who speak Catalan, either as much or more than Spanish, take their Catalan phonological distribution of /s/ and impose it to their Spanish to create a contrast, which now enables them to distinguish between *ha sido* [asiðo] and *has ido* [aziðo], i.e. their desire to contrast between word-final /s/ and word-initial /s/ motivates them to impose their Catalan phonology onto their spoken Spanish. Indeed, the raw data and the binary analysis both support this hypothesis since word-final /s/ was the only intervocalic /s/ context to favor both voicing (0.67) and fully voiced /s/ (0.82); the next highest factor weight for the intervocalic context was /s/ in Spanish but /z/ in Catalan, with a factor weight of 0.45 for voicing and 0.39 for fully voiced tokens.

The fact that Spanish /s/ cognates that are /z/ in Catalan, e.g. Sp. /casa/ ‘house’ and Cat. /kaza/ ‘house, do not favor voicing in the slightest bit is a very interesting result of this study, one that lines up perfectly with Van Coetsem’s model. In Castilian Spanish, there is already a structure in place that makes sure that there will never be a word-internal, minimal contrast between [s] and [z]: distinction between /s/ and /θ/. As mentioned in Chapter 1, in the beginning in the fifteenth century Spanish underwent a process of devoicing, which affect the sibilants, e.g.

/kaʒa/ → /kaʒa/. This created a situation where speakers had to distinguish between /kaʒa/ *casa* ‘house’ and /kaʒa/ *caça* ‘hunt,’ solely on the basis of the place of a slight difference in the articulation of two sibilants (apicoalveolar vs. predorsodental). To make the distinction more pronounced, there was a change in the place of articulation, from the dental /s̺/ to the interdental /θ/. So, even if Catalan Spanish were to voice /s/ word-internally, e.g. *casa* [kaʒa], it would not create a new contrast; it would just be replacing one allophone, [s], with another, [z], both of which contrast with /θ/. Since there is not a functional need for /s/ to become /z/ word-internally, this why the participants in the study are not applying their Catalan phonological distinction between /s/ and /z/ onto their spoken Spanish.

Although there is a situation-specific explanation for /s/ voicing in Catalan Spanish, the data presented in this paper also supports some of the overall findings in the current /s/ voicing literature. García (2011), in her work on Ecuadorian Spanish, found that the residents of Loja, Ecuador also intervocalically voice /s/. The data showed an uneven distribution, with most of the tokens centering between 0 to 30% voicing; after the 30% voicing there was a noticeable decrease in the number of tokens in the subsequent categories, e.g. 31-40%, 41-50% etc., until the 91-100% voicing category, which saw an increase in the number of tokens. This data distribution in García (2011) is nearly identical to the one present in Figure 5 on page 21. Of the 1,125 tokens she extracted from twelve participants, 145 tokens were fully voiced, 12.9% of the total data; she also found that 20% of the word-final tokens were fully voiced and that this intervocalic context strongly favored /s/ voicing. These results are nearly identical to this study’s findings: 13.3% of the overall tokens were fully voiced, 28.9% of the word-final tokens were fully voiced and word-final position strongly favored voicing.

The results of this study and García (2011) fit well into the general trend of word-final consonantal weakening across the varieties of Spanish. It is well documented that /n/ is realized as the velar [ŋ] word-finally in Northwestern and Southern Spain, in addition to Central America and the Caribbean; in the respect to /s/, the literature is also very clear that word-final /s/ can either be elided or aspirated in Andalusia, the Canary Islands, and the Caribbean (Morgan 2010). A recent study by Torreira and Ernestus (2011) on the voicing of intervocalic fricatives in Madrid not only found that /s/ was more likely to be voiced than the other fricatives /f/, /θ/ and /x/, but also that /s/ was more likely to be voiced in word-final position (45%) than word-initial (31%) and word-medial (29%). Although these three numbers are higher than the present study and García (2011), they all seem to suggest that word-final /s/ is more prone to voicing than other intervocalic positions, perhaps suggesting that word-final /s/ is intrinsically different from other intervocalic /s/, phonetically speaking. While the present study did not code for specific morphological factors, Torreira and Ernestus looked at three types of word-final /s/, non-suffixes (e.g. *lunes*), non-redundant suffixes (e.g. *quiero verlas*) and redundant suffixes (e.g. *las casas*), and found that redundant suffixes exhibited more voicing (56%) than the non-redundant suffixes (50%) and non-suffixes (48%). However, they concluded the discussion of the morphological status of /s/ by saying “our data seem to suggest that morphology by itself is not a good predictor of phonetic variation,” perhaps leaving room for other factors, especially sociolinguistic, to also affect /s/ voicing. That is where the results of this study come into play, merging phonology and morphology with sociolinguistics, i.e. the imposition of the word-final /s/ morpheme marker by those more dominant in Catalan is facilitating the voicing of /s/ in Catalanian Spanish.

The results from Torreira and Ernestus (2011), García (2011) and this study seem to suggest that there may be guiding principles for intervocalic /s/ voicing in Spanish, especially

since these studies look at three different dialects of Spanish. However, it is clear that more research needs to be conducted on other Spanish dialects where /s/ voicing is taking place, like Costa Rica (Terrell Morgan, personal communication, October 19, 2011). García points out that Lipski has looked at /s/ voicing in Bolivia and Costa Rica, but there have been no empirical studies on these dialects; anecdotally, she also mentions that during a conference presentation of her paper that a presenter from Mexico City had some intervocalic /s/ voicing. Despite these claims, until more empirical research is done on the /s/ voicing in more Spanish dialects we can only tentatively conclude that the trend presented in García (2011) and this paper is how /s/ voicing functions in Spanish.

Clearly, more research needs to be conducted not only on /s/ voicing, but also on Catalanian Spanish in general. The literature has focused on how Spanish has influenced Catalan, but the studies on how Catalan has influenced Spanish are few and far between; furthermore, the research has mainly been dedicated to morphosyntactic variation and not to phonology. There has been some phonological research to come out of the Balearic Islands (Blas-Arroyo 2007), one of the Catalan-speaking regions of Spain, which details how their Spanish has been affected by Catalan, such as in vowel reduction and neutralization of the phonemes /s/ and /θ/ in favor of /s/, i.e. *seseo*, but the studies tend to take more of a qualitative than quantitative approach. I can confirm hearing the vowel reduction and the neutralization of /θ/ in some of my participants, in addition to the velarization of /l/ in coda position and the distinction between the palatal lateral /ʎ/ and voiced palatal stop /j/. These phonological features would be great points of departure for future empirical, sociophonetic studies to add to the knowledge of this understudied and widely ignored variety of Spanish.

Finally, an expanded study on /s/ voicing in Catalanian Spanish would further add validity to the results found in this paper. This study was somewhat limited in its participant distribution, e.g. there were few Spanish speakers and no one older than 49 included in the data, so future studies would ideally include a more representative sample of the population of Catalonia. It would also be helpful to obtain a recording of the participants speaking Catalan as a means to compare their Catalan [s] and [z] to their Spanish ones; this would help to categorize the Spanish /s/ tokens into either voiceless, partially voiced or fully voiced categories based on how they articulate their Catalan [s] and [z]. Perceptual studies of /s/ voicing in Catalanian Spanish would also be interesting, because only one participant was able to state that the /s/ of Catalanian Spanish is different from the “standard” Castilian one.

This paper set out to document the phenomenon of /s/ voicing in Catalanian Spanish and to provide the linguistic and sociolinguistic factors that favor it, in addition to presenting a plausible explanation for why it occurs. Through an acoustic analysis of 2,714 tokens from 16 Spanish/Catalan bilinguals, this study has shown that word-final /s/, spontaneous speech, females and participants who claim to use both languages equally are all factors that favor the voicing of /s/. Furthermore, a contact-induced change framework showed that /s/ voicing is occurring in Catalanian Spanish because the bilingual speakers are imposing their Catalan /s/ distribution onto their spoken Spanish, while keeping their Catalan phonemic contrast of /s/ and /z/ separate when they speak Spanish. Finally, this study set out to support the general /s/ voicing trends found in Madrid and Ecuador in the hopes of defining some of the principles guiding /s/ voicing in modern-day Spanish. Hopefully, there will be more research documenting other phonological aspects of Catalanian Spanish and more cross dialectal /s/ voicing work in the coming years because these are both potentially interesting topics for the field of Spanish linguistics.

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Appendix

Verbal Consent Script

In Spanish:

Nosotros necesitamos de su ayuda para hacer una investigación lingüística sobre su forma de hablar, su dialecto, para la Universidad de Ohio State. Su participación consiste en una entrevista voluntaria de aproximadamente 30 a 60 minutos que va a ser grabada. Si usted acepta, sólo hablaremos de temas generales, nada personal. Usted es libre de terminar la entrevista cuando quiera. La información grabada es absolutamente confidencial y no hay ningún riesgo ni beneficio personal como resultado de su participación en el estudio. Usted puede preguntar lo que quiera sobre nuestra investigación. Al final, le vamos a entregar un papel con nuestra información para que nos contacte en caso de que tuviese más preguntas en el futuro. Es posible que podemos usar su grabación en estudios de futuro pero podemos destruir su grabación si usted no quiere que la usemos. También, podría compartir copias de la grabación y su transcripción con otros investigadores, pero cualquier información confidencial o identificable se omitirá primero. Muchas gracias por su tiempo.

In English:

We are asking for your participation in a linguistic study authorized by The Ohio State University that will allow us to get information about the characteristics of your dialect, the way you speak. Your participation consists of an interview that will last approximately 30 to 60 minutes and it will be recorded. If you accept you will be asked to talk about topics you feel comfortable with. Your participation is strictly voluntary and you are free to stop it at any time without suffering any kind of penalty. The information collected in this study is absolutely confidential and we do not anticipate any risk or personal benefit as a result of your participation in this study. You are free to ask any question you want. We are giving you a sheet for you to keep, with our contact information in case you have further comments or concerns related to this investigation. Your recorded interview may be used in future studies but we will destroy the recording if you do not want us to use it. Copies of the recording and transcript may be made to share with other researchers, but any identifiable or confidential information you give me will be removed first. Thank you very much for your time.

Interview Questions (Spanish)

- ¿Dónde naciste?
- ¿Cuál es tu sitio favorito en tu pueblo?
- ¿Dónde trabajas?
- ¿Cuántas lenguas hablas? ¿Cómo las aprendiste? Si sigues estudiando otras lenguas hoy en día ¿por qué lo haces?
- ¿Cómo eran tu casa y tu familia durante tu niñez?
- ¿Cuál es tu recuerdo favorito de tu niñez?
- ¿Cuál fue el momento en que te diste cuenta de que hay dos lenguas habladas en Cataluña? ¿Y el momento cuando te diste cuenta de que hay dos culturas, catalana y española, en esta región?
- ¿Cuál es tu tradición catalana favorita?
- Recuerdo que en la navidad hay dos tradiciones catalanas que son únicas y diferentes del resto de España: el caganer y el tió de Nadal. ¿Puedes explicarme estas tradiciones?
- ¿Cuál es el plato más típico de Cataluña?
- ¿Eres un fan del Barça? ¿Qué es el significado del lema “més que un club”?
- ¿En qué contextos usas castellano? ¿catalán?
- ¿Piensas que eres español(a), español(a) y catalán(a), o sólo catalán(a)?
- ¿Crees que en tu vida habrá una Cataluña independiente de España? ¿Estás a favor de esta idea y por qué?
- No hay muchas noticias en los EEUU sobre España, sólo sé que hay muchas manifestaciones: ¿puedes describirme la situación política de España de hoy en día?
- ¿Cuál es tu opinión sobre las otras regiones distintas, como País Vasco y Galicia? ¿Crees que tienes algo en común con ellos?
- ¿Cuál fue el momento y/o evento más chistoso de tu vida o la vida de un amigo?
- ¿Has estado en algún momento en peligro de muerte?
- Cuando hablas en castellano fuera de Cataluña ¿saben los españoles que eres de Cataluña? ¿por qué? ¿es por vuestra manera de hablar o algo más?

Interview Questions (English)

- Where were you born?
- What is your favorite spot in your town?
- Where do you work?
- How many languages do you speak? Where did you learn them? If you still study other languages, why do you do so?
- What were your house and your family like growing up?
- What is your favorite memory from your childhood?
- What was the moment that you realized that there are two languages spoken in Catalonia? What was the moment that you realized that there are two cultures in Catalonia, a Spanish and a Catalan one?
- What is your favorite Catalan tradition?
- I remember that during Christmas there are two Catalan traditions that are unique and different from the rest of Spain: *el caganer* and *el tió de Nadal*. Can you explain these traditions to me?
- What is the most typical Catalan dish?
- Are you a fan of FC Barcelona? What is the meaning of the phrase “*més que un club*” (“more than a club”)?
- In what contexts do you use Spanish? And Catalan?
- Do you think you are Spanish, Spanish and Catalan, or only Catalan?
- Do you believe that you will see an independent Catalonia from Spain in your lifetime? Are you in favor of this idea and why (or why not)?
- There is not much news in the United States about the situation here in Spain, I only know that there are protests. Can you tell me what the political situation is like in Spain?
- What is your opinion on the other culturally distinctive regions in Spain, like the Basque Country and Galicia? Do you believe that you have something in common with them?
- What was the funniest thing that has ever happened to you or a friend?
- Have you ever been in danger of dying?
- When you speak Spanish outside of Catalonia, do the Spaniards know that you are from Catalonia? Why? Is it because of your way of speaking?

Reading Paragraph: Parc Güell

Yo soy el turista serio que ves en las antiguas plazas y museos, sacando un mogollón de fotos en rápida sucesión, sin parar para recuperar el aliento. Además, en las visitas guiadas presto mucha atención al guía cuando habla, porque siempre presenta unos hechos intrigantes sobre el sitio que nunca se podría encontrar, incluso en los libros más informativos. Por ejemplo, ¿sabes que muchos de los mosaicos en Parc Güell fueron diseñados por Josep Maria Jujol, un arquitecto menos conocido que colaboraba con Gaudí en proyectos impresionantes como Casa Milà y Casa Batlló? Aprendí esto y otros datos interesantes durante mi viaje al Parc Güell, uno de los parques más extravagantes de todo el mundo. Al principio de la visita, pasamos por la entrada del parque donde hay dos edificios extraordinarios en los que se puede subir a la planta superior y meter la cabeza por la ventana. <<Estos son los pabellones donde Gaudí intentaba reflejar las estructuras orgánicas de la naturaleza>> dijo Teresa, nuestra guía. <<Gaudí utilizó la técnica de la bóveda catalana, que consistía en la superposición de varias capas de ladrillos con argamasa.>> Luego, pasamos a las escaleras para ver las dos estatuas más famosas del parque: el dragón y la serpiente. Teresa nos explicó que el dragón representa la ciudad en que Gaudí se crió y la serpiente es una alusión a la medicina. Además añadió que en realidad los dos animales son fuentes y por el tanto son una fusión de arte y funcionalidad. Esto es un tema en las obras artísticas de Gaudí, tal como nosotros vimos en la plaza del Parc Güell donde se recoge la lluvia en un depósito subterráneo para regar el parque. Desafortunadamente, aquí la guía terminó la visita pero nos dejó con un consejo: <<Os recomiendo que visitéis la casa rosa en el Camino del Rosario; es un museo que pienso que os gustará. ¡Gracias y adéu!>>. Con esta promesa de más conocimientos de Gaudí me marché hasta la casa rosa, que era el lugar de residencia del arquitecto desde 1906 hasta 1925, pocos meses antes de su muerte. El museo contiene amplias obras de Gaudí y de algunos de sus colaboradores en tres plantas accesibles y bien diseñadas; lo más destacado fueron los muebles únicos, diseñados por el propio Gaudí. Después de este largo día, me senté en un banco mirando la escena del parque: unas aves volando, los árboles meciéndose en la brisa y una familia disfrutando unas españolísimas tapas, como unas aceitunas verdes y la tortilla. Esto es la vida de un turista profesional y me pongo triste cuando pienso que en menos de dieciséis horas estaré en un avión, sentado en un asiento incómodo, soñando con mi próximo viaje fuera de los Estados Unidos.