

SOCIAL DYNAMICS OF CATALAN-SPANISH CONTACT
IN THE EVOLUTION OF CATALONIAN SPANISH

BY

JUSTIN DAVIDSON

DISSERTATION

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Doctoral Committee:

Associate Professor Anna María Escobar, Chair
Professor José Ignacio Hualde
Associate Professor Zsuzsanna Fagyal
Associate Professor Erik Willis, Indiana University
Assistant Professor Joseph Roy

Abstract

The research objectives of this dissertation are: (1) to empirically investigate the origin behind two (contact) features of Catalanian Spanish, [ɫ] and [z], inquiring the role of specific linguistic and social factors as relevant in the process of linguistic influence from Catalan, and (2) to empirically uncover the sociolinguistic profile of each of [ɫ] and [z] in the respective social and linguistic ecologies of the Barcelonan bilingual community. Grounded in a speaker-based theory of language change (cf. Weinreich, Labov, & Herzog 1968) and a comparative sociolinguistics study of language contact (cf. Poplack & Levey 2010), this thesis treats linguistic variation as ‘structured’ heterogeneity (cf. Labov 1982). Qualitative and quantitative measures are used to analyze the variable use of the variants within and across different groups of bilingual speakers, consequently providing insight into the spread and development of these variants within the community. Accordingly, by exploring questions related to the development of language influence in a contact situation, a detailed study of the relevant linguistic and social factors serves to explain the origin and diffusion of contact features, therein speaking to their actuation and propagation (cf. Weinreich et al. 1968).

Speech data were elicited from 4 experimental studies designed following phonetics and second language research frameworks, and informed by quantitative and variationist approaches to sociolinguistics: (1) careful pronunciation word-list reading, (2) casual speech informal interview, (3) matched guise [covert attitudes], and (4) debriefing interview [overt attitudes]. Tasks were administered to a group of Barcelonan Catalan-Spanish bilinguals, stratified by age, gender, and language dominance, in addition to a group of Catalan-dominant speakers (stratified by gender and age) from surrounding smaller Catalan-prevalent villages, and lastly a control group of monolingual Spanish speakers from Madrid. Token-by-

token detailed phonetic analyses of lateral velarization and intervocalic fricative voicing were performed using a combination of manual and automated methods in Praat, along a gradient, non-discrete continuum. Inferential statistics, including chi-square and mixed-effect GLM techniques were performed using R.

Results from these statistical analyses provide empirical evidence that [ɫ] and [z] production in Barcelonan Spanish is directly influenced by contact with Catalan. This influence is shown to be manifested both linguistically, in the form of sensitivities to linguistic constraints from Catalan, as well as socially, in the form of more frequent usage with increased exposure to and usage of Catalan (i.e., Catalan-dominant speakers). Additionally, statistical analyses reveal differences between social values and overt awareness regarding [ɫ] and [z], in that the former variant is overtly recognized as a negative stereotype of Catalanized Spanish, particularly by Spanish-dominant bilinguals and monolinguals from Madrid. In contrast, the latter variant lacks overt negative social commentary, being instead covertly and positively associated with closeness to the Catalan speaker (i.e., solidarity) by Catalan-Spanish bilinguals. These divergent social values are argued to account for the more advanced propagation of [z] than [ɫ] amongst bilingual speakers, as characterized by the dissimilar usages of each variant beyond the speech of the most Catalan-dominant bilinguals (and in particular, youth female Spanish-dominant bilinguals). Accordingly, the findings help to emphasize social values linked to particular linguistic features as a driving force in their propagation, and accordingly, in language change. Moreover, they highlight how the path of diffusion of contact features is necessarily mediated by language dominance in the bilingual community.

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CHAPTER 1: INTRODUCTION

The focus of this doctoral dissertation concerns the complex interplay of linguistic and extralinguistic (or social) factors underpinning language variation, which can lead to language change in a situation of language contact. The specific language in question is Spanish, and the Spanish variety under investigation is that of the diverse community of bilingual speakers of Catalan and Spanish in Catalonia, Spain. Spanish in Catalonia, which has been in contact with Catalan for multiple centuries (Turell Julià 2000: 46; Vallverdú 1984: 19), will for the sake of clarity be referred to as Catalan Contact Spanish (cf. Davidson 2012a; 2012b; 2014a; forthcoming), henceforth CCS.

This study centers on two phonetic features of CCS traditionally ascribed to direct first language (L1) transfer (cf. Odlin 1989) from Catalan (a sister Romance language structurally quite similar to Spanish) in order to further explore the details of the role of language contact in this particular case of language variation and change (cf. Hickey 2012; Winford 2003). By exploring the social dynamics of language variation in a minority-language community characterized by widespread bilingualism, this study contributes to a comparatively newer line of variationist research within bilingual, multilingual, and minority-language communities (cf. Montoya, Hernández, & Gimeno 1995; Poplack & Levy 2010; Stanford & Preston 2009; Turell Julià 1995) that is often unacknowledged in the canonical Labovian line of variationist research (cf. Labov 1963; 1966; 1972; 1994; 2001; 2007).

The two phonetic features under investigation are the velarization of the voiced alveolar lateral [l] to velarized [ɫ] (e.g. *al parque* ‘to the park’ [al.pár.ke] > [aɫ.pár.ke]) and the voicing of the intervocalic voiceless alveolar fricative [s] to voiced [z] (e.g. *los años* ‘the years’ [lo.sá.ɲos] > [lo.zá.ɲos]). The selection of these particular two phonetic features is

motivated by their frequent presence in descriptive and/or impressionistic previous treatments of Catalan interference (cf. Payrató 1985; see also Weinreich 1953: 1) in the Spanish speech of bilinguals in Barcelona (cf. Báez de Aguilar González 2008; Benet, Cortés, & Lleó 2012; Sinner 2002; Vann 2000; 2001; Wesch 1997) and other Catalan-Spanish bilingual territories (cf. Arnal 2011; Casanovas Català 1995; Moll 1961; Payrató 1985; Pieras 1999; Serrano Vázquez 1996a; Simonet 2008; 2010a; 2010b). Notably, aside from permitting comparisons between usage patterns of Barcelonan CCS velarized [ɫ] and intervocalic voiced [z]¹ with those reported from empirical research in Palma de Majorca, Balearic Islands (cf. Pieras 1999; Simonet 2008; 2010a; 2010b), the focus on Spanish in contact with Catalan specifically in Barcelona is made prudent by the particularly intense presence (or predominance) of Spanish in the urban capital. As a result of massive waves of immigration from monolingual Spanish speakers from Southern Spain in the mid-20th century, in addition to more recent (last 15 years) waves of Spanish-speaking immigrants from South America and the Caribbean, the metropolitan capital of Barcelona is an ideal site for research on language contact, with a variety of different types of bilingual speakers according to language dominance and social characteristics, in comparison with smaller, less urban cities and towns that remain relatively more homogenous in their predominance of L1-Catalan speakers (Institut d'Estadística de Catalunya 2011; Institut d'Estudis Catalans 2011).

By examining two phonetic features of 'Catalanized Spanish' and distinguishing types of bilingual speakers that exhibit these features, this dissertation seeks to complete two broad research objectives within a wide sociolinguistic framework that incorporates a variety of research methodologies informed by the fields of language variation and change, quantitative variationist sociolinguistics, contact linguistics, and sociophonetics: (1) empirically investigate the origin behind [ɫ] and [z] with respect to linguistic and social

¹ Except in instances of clarification or emphasis, '[ɫ]' and '[z]' will henceforth be used to respectively refer to the velarized alveolar voiced lateral and the intervocalic voiced alveolar fricative.

factors reflecting Catalan influence, and (2) empirically determine the roles of each of [ɫ] and [z] in the social and linguistic ecologies of the Barcelonan bilingual community. Accordingly, this work offers a discussion of the use and change in use of these variants within and across different groups of bilingual speakers, as well as of their possible propagation or diffusion in the community as reflected in their distributions of use across the community.

More broadly, this research on language variation and change contributes to several subfields of linguistics: (1) in second language acquisition, the investigation of contact features is suggestive of what kinds of (L2) linguistic features may be permeable to transfer from native (L1) varieties, (2) in contact linguistics, it serves as a crucial response to the smaller amount of linguistics, language contact, and bilingualism research concerning the linguistic effects of a minority language² on a majority language, (3) in sociolinguistics, aside from constituting an empirical examination of language variation and change, it aids in the development of a more accurate profile of types of bilinguals for whom contact-induced features are favored, and additionally furthers an innovative phonetically-driven approach to matched guise techniques, and (4) in phonetics, it provides empirical support for the treatment of velarization and voicing phenomena along a scalar (or gradient) non-discrete continuum. In sum, the dynamics of language variation involving contact variants (emergent from L2-speech) are the focus of this research, which, treated as the aggregate product of individual second language (or simultaneous dual first language) acquisition, speak to the broader community dynamics of language change, that is, the evolution of the variety of Spanish spoken in the bilingual region of Catalonia, Spain.

In what follows in this chapter, we provide further theoretical foundations for this dissertation within established frameworks of variationist sociolinguistics and contact

² Though further information on the status of Catalan and Spanish in Catalonia is provided in section 1.3, it is worth noting that unlike many other minority languages, Catalan in Catalonia is presently not effectively marginalized. Rather, it enjoys a strong and ongoing base of support from the government and is well-integrated within the political, legislative, and public societal spheres.

linguistics, particularly as shaped by speaker-based perspectives on language variation and change. Additionally, we shall review the socio-historical background of Catalonia and Barcelona as the site for sociolinguistic research of the influence of a minority language on a majority language, focusing on policies of language planning and the socio-political power of Spanish and Catalan in Catalonia, as well as offer necessary insight into the historical foundations of modern language attitudes, ideologies, and language use of bilingual speakers in present-day Catalonia.

1.1. Language Change

This dissertation explores language variation and change within a Speaker-based Theory of Language Change, first expounded in the seminal work of Weinreich, Labov, & Herzog (1968). This approach to language change differs substantially from that which is frequently utilized in comparative and historical linguistics. Frameworks of (diachronic) language change within the field of historical linguistics (cf. Bynon 1977; Lass 1980; 1990; 1997) predominantly explore language change as an unambiguously structurally-motivated process. To this end, a considerable degree of agentivity is given to languages or grammars as concrete entities that, driven by pattern pressures (or structural imbalances) and universal structural tendencies, intrinsically evolve over time (Thomason 2008: 47). Sapir (1921: 160-161, 165-166) described the result of these structural forces as “cumulative in some special direction,” indicative of an innate path along which languages evolve: “Language moves down time in a current of its own making. It has drift.”³

A clear consequence of this emphasis on natural, structurally-based change (particularly as influenced by Neogrammarian treatments of sound change as highly regular

³ Trudgill, Gordon, Lewis, & MacLagan (2000) have proposed a considerably more specific theory of Sapir’s *linguistic drift*, exclusive to situations of disconnected language varieties resultant from (sudden) population movements. One may refer to Britain & Sudbury (2002), Davidson (2014b), Keiser (2009), and Kerswill, Torgersen, & Fox (2008) for work using this revised theory of linguistic drift.

and internally-driven) is that frameworks of comparative and historical linguistics have traditionally preferred strictly endogenous accounts of language change that exclusively appeal to linguistic (often sound or phonetic) laws and universal linguistic tendencies (cf. Lass 1997). Factors external to the grammar of the language that undergoes a particular change, such as dialect contact, language contact, and facets of speaker behavior (i.e., the dynamics of communicative social interaction), are typically only appealed to as a means of accounting for exceptions to the rule (e.g., if a sound change fails to apply to a certain set of lexical items, etc.). Accordingly, within this kind of framework, an account posited for a particular instance of language change that appeals exclusively to linguistic factors (internal to the language in question) is considered more parsimonious than one which necessitates the consideration of extralinguistic factors (Filppula 2003; Milroy 1993; 2003: 144).

Despite the relative success that these kinds of Neogrammarian approaches to language change (that emphasize language-internal motivations to the near exclusion of their counterparts) have enjoyed within frameworks of comparative and traditional historical linguistics, the lack of consideration of social factors made it difficult to account for why certain linguistic changes “take place in a particular language at a given time, but not in other languages with the same feature, or in the same language at a different time” (Weinreich, Labov, & Herzog 1968: 102). This problem is referred to as the *actuation problem*, acting as the impetus behind a starkly different theory of language change posited by Weinreich et al. (1968) that centers on the interplay between linguistic and social factors within patterns of speaker interaction. In the subsections below, we elaborate on Weinreich et al.’s (1968) Speaker-based Theory of Language Change by detailing each of several crucial differences from a more Neogrammarian model, including the role of the speaker, the process (and limits) of language change, applications within the Labovian variationist sociolinguistic framework, the interplay between linguistic and social factors, and lastly the context of

language contact (particularly as related to the emergence and empirical classification of contact innovations).

1.1.1. Speakers in Language Change

Speaker-based approaches to language change (cf. Milroy 2003; Milroy 2004; Milroy & Milroy 1985; Weinreich et al. 1986) focus on individual speakers and speaker groups as the *agents* of language change. To give a more concrete example of speaker agentivity, we may consider the case of a sound change. Sounds themselves do not actually change - rather, speakers begin using one particular sound (or phonetic variant) in the context where another sound was previously used most often (Milroy 2003: 150). Thus, rather than treating languages as agents of change (i.e., ‘language Y experienced a merger between sound X and sound Z,’ or ‘language Y developed additional prepositions as a response to semantic ambiguity from a loss of case distinctions,’ or ‘language Y became a fixed SVO language as a result of a loss of inflectional suffixes,’ etc.), speaker-based accounts of language change focus on the linguistic behavior of speakers, who collectively change the language by process of adopting linguistic innovations originating within individual speakers or smaller speaker groups. Hickey (2012: 404; see also Paredes & Sánchez-Prieto Borja 2008: 22; Milroy 2003) offers a succinct overview of the relationship between the speaker and the language within speaker-based theory:

“Speakers are the agents of change. It goes without saying that speakers change language and that the term ‘language’ is an abstraction over the collective behavior of a speech community. It is salutary to remember that when one is dealing with structural and developmental tendencies in language it is in the linguistic behavior of speakers that these are manifested.”

Thus, as the agents of language change, it is ultimately the speakers themselves, by virtue of

their adoption (or lack of adoption) of a particular innovation, that permit language change to take place.

The role of speaker agency (i.e., intentionality or deliberateness) regarding the production of linguistic features (i.e., the selection of one feature's usage over another) is also of interest when discussing language change. That is, it is worth considering whether or not a speech community is capable of consciously and deliberately bringing about (or resisting, for that matter) linguistic patterns that can lead to change.⁴ At the level of the individual speaker, it is widely known that speakers are not always consciously aware of their selection or choice of linguistic variants, but rather instead, “[a] fascinating thing about linguistic [variants] is that people are often completely unaware that they use them...” (Tagliamonte 2012: 6).⁵

To this point, research on *linguistic accommodation*⁶ confirms that speakers are often unaware of the complex and nuanced pattern of choices they make when selecting linguistic variants for speech production (Hay & Drager 2010; Pardo 2012 and references within). Even at the level of the speech community, in the context of community-wide processes of language change the lack of overt awareness of particular language patterns (i.e., usage patterns of specific linguistic features) is a foundational component of the variationist sociolinguistic canon, constituting *change from below*: “[Change from below is] the primary form of linguistic change [that] operates within the system, below the level of social awareness. Th[is] include[s] the systematic sound changes that make up the major

⁴ Moreover, speakers do not necessarily have complete control over every element of their linguistic production. Whereas one may imagine a scenario in which a speaker consciously avoids the use of expletives while giving a formal speech, it becomes comparatively somewhat less clear the extent to which the use of a particular allophone over another, for instance, can be as easily or even consistently deliberate.

⁵ While some speakers in fact tend to categorically use one linguistic feature over another, many others tend to maintain a much more variable usage of both (or multiple) features (Turell Julià 1995: 276; Sankoff & Blondeau 2007).

⁶ *Linguistic accommodation* is the ephemeral phenomenon by which speakers adjust their speech production (and even speech perception) to become more similar to or more distinct from that of their interlocutor. This phenomenon is subconsciously influenced by social characteristics of the listener, the referee, and/or the topic of conversation, and is also termed *style shifting* (cf. Bell 1984; 1997; Coupland 1984; Hay, Jannedy, & Mendoza-Denton 1999; Rickford & McNair-Knox 1994).

mechanism of linguistic change (Labov 2001: 279; see also Labov 1994: 78). Accordingly, given the pervasiveness of language variation and subsequent change below the level of overt awareness, it is unsurprising that comparatively little weight is attributed to deliberate language change at the community level diachronically (cf. Thomason 2007).⁷

Thomason (2007: 41) notes that within (traditional) historical linguistics, “...the general assumption has been that [deliberate linguistic] changes [especially though not exclusively in language contact situations] are relatively trivial, confined mainly to the invention or borrowing of new words, changes in lexical semantics, and the adoption of a few structural features from a prestige dialect.” The proposition that certain areas of the grammar (particularly those that do not affect deep structure, such as semantics, pragmatics, and lexicon) are more easily subject to deliberate change than others is corroborated by Romaine (1996), who posits an agentivity continuum for various grammatical domains. Pragmatics and semantics are distinguished from syntax, phonology, and phonetics in that the former group is more susceptible to intentional change by speakers, whereas the latter group is less consciously controllable:

“Speakers exercise more power over, or are more active agents in those aspects or parts of the language system where intrinsically meaningful choice exists. The system is virtually open-ended with respect to pragmatics, i.e. the rules or norms of speaking, which are man-made and socially constituted. The speaker is conversely more patient-like in the domain of phonetics and phonology, where the mechanical, physiological constraints of executing or realizing meaningful utterances via a channel in real time are operative” (Romaine 1996: 111-112).

Labov (1994: 598) offers a similar perspective on the limits of deliberate speaker choices on long-term structural language change: “There is a part of language behavior that is subject to

⁷ Hickey (2012: 404-405) adds that it may be in fact somewhat common that overt awareness of changes in progress stems from prescriptivism in the form of negative social commentary regarding the exclusion from formal speech registers of innovations that arise first in colloquial speech.

conscious control, to deliberate choice, to purposeful and reflective behavior. But as far as I can see, it is not a major part of the language faculty, and it has relatively little influence on the long-range development of language structure.” In light of the generally accepted lack of contribution of deliberateness or conscious, intentional agency to linguistic variation and ultimately language change (though see Thomason [2007] for further discussion on the conditions that are most conducive to deliberate change), linguistic variation regarding CCS [ʔ] and [z] production in this dissertation is considered primarily non-deliberate, or not subject to conscious intentional decisions of the speakers to use one linguistic feature in a particular instance instead of another. This will additionally corroborated by means of a perception study that aims to quantify the degree of overt awareness of each of CCS [ʔ] and [z].

1.1.2. The Process of Language Change

The aforementioned focus on speakers as the “access points to [linguistic] systems” (Milroy 2003: 149) does not suggest that individual speaker variation or idiolectal innovation directly begets language change. Rather, as noted by Milroy (1992: 221): “...an innovation in a[n individual] speaker’s output is not a linguistic change until it has been agreed on and adopted by some community of speakers.” Accordingly, linguistic variation is not synonymous with nor evidence of language change (Poplack & Levey 2010: 394).⁸ Without showing that a particular innovation has diffused throughout a community of speakers, it is inappropriate to conclude that any change has taken (or is taking) place (Hickey 2012: 404; Polack & Levey 2010: 396).

This process of language change, or the gradual and collective adoption of a particular linguistic innovation or language norm by a community of speakers (Fagyal, Swarup,

⁸ Weinreich et al. (1968: 188) address this point as a general principle of language change: “Not all variability and heterogeneity in language structure involves change; but all change involves variability and heterogeneity.”

Escobar, Gasser, & Lakkaraju 2010: 2061-2062; Hickey 2012: 404; Turell Julià 1995: 277), is characterized by Croft (2000: 117-165) with respect to three distinct phases. The first, deemed *innovation*, refers to the incipient processes of change in which a novel linguistic feature first emerges or originates within a single individual or small group of speakers, deemed *innovators*.⁹ The second phase, *selection and propagation*, refers to the gradually accelerating adoption of a given feature by the wider community, particularly as linked to a shared social meaning afforded to the feature within the community. This phase, perhaps more commonly referenced as *diffusion*, is what Weinreich et al. (1968) describe as the *actuation* of a particular instance of language change and is considered the first point at which one can assert that change has truly begun taking place (insomuch as a feature has at this point been adopted by a sufficiently large enough group of speakers [deemed *adopters*] in the community to constitute a majority feature). Lastly, the *fixation* stage is characterized by the full, community-wide adoption of a feature, at which point the social evaluation of the feature may change and eventually give way to competition with a brand new variant in its *innovation* stage.

The notion that language change is necessarily the product of the collective adoption of a linguistic innovation by a group or community of speakers is echoed and well-established in the field (cf. Croft 2000; Fagyal et al. 2010; Kammacher, Stær, & Normann Jørgensen 2011; Labov 2001; Milroy 2003; Milroy 2004; Milroy & Milroy 1985; Montoya et al. 1995; Poplack & Levey 2010; Thomason 2007; Weinreich et al. 1986).¹⁰ Thus, as the first

⁹ Within more generative approaches to language and linguistic change (cf. Lightfoot 1979; 2002), ‘change’ has been used to describe the first appearance of a novel linguistic form (or innovation) in a single speaker’s grammar, irrespective of how this novel feature is perceived or picked up by other speakers (Thomason 2007: 45). Such views on language change are primarily framed within the processes of first language acquisition (Poplack & Levey 2010: 396), and would accordingly consider the *innovation* phase in Croft’s (2000) model a full-fledged example of language change, independent of whether or not the feature was later adopted by more speakers.

¹⁰ To this point, Weinreich et al. (1968: 187) define the start of language change as precisely when members of a speech community adopt a particular innovation and in so doing give it ‘direction’ (or a trajectory of greater and/or specific usage) within the community: “Linguistic change is not to be identified with random drift proceeding from inherent variation in speech. Linguistic change begins when the generalization of a particular

emergence (or the origin) of a linguistic innovation during Croft's (2000) innovation phase is required for linguistic change to take place, it accordingly can be considered the first step in the process of language change. However, since a linguistic feature's emergence (in the innovation phase) is in no way predictive of nor ensures its subsequent diffusion, the first instantiation of actual language change does not occur in this first phase, but rather instead during Croft's (2000) second phase of selection and propagation, arriving at full completion (i.e., a complete instantiation of language change) in the final stage of fixation. In this dissertation, by analyzing group trends and the [ʔ] and [z] production rates of individual speakers of Barcelonan CCS, we shall make an empirical assessment of in which group of speakers CCS [ʔ] and [z] most likely emerged, and whether or not the actuation of these two features is taking place, both within the original group of speakers that innovated the features, as well as outside this group into the wider CCS community.

1.1.3. Labovian Variationist Sociolinguistics

Speaker-based approaches to language variation and change align well with Labovian variationist approaches to language change inasmuch as the latter seek to identify patterns of language use that are understood as recurrent choices (or selections of linguistic variants) made by individual speakers which may or may not “catch on” as a wider norm within the community (Labov 2001; Thomason 2001; Thomason & Kaufman 1988). Weinreich et al. (1986: 101) in fact assert that “the key to a rational conception of language change - indeed, of language itself - is the possibility of describing orderly differentiation in a language serving a community.” This “orderly differentiation,” later referenced by Labov (1982: 17) as “normal heterogeneity,” is a paramount tenet of variationist sociolinguistics, which deems that linguistic variation is always present and in fact inherent to language (Labov 2001: xi;

alternation in a given subgroup of the speech community assumes direction and takes on the character of orderly differentiation.”

Tagliamonte 2006: 5; 2012: 2; Weinreich et al. 1968: 187-188; see also Labov 1969: 728).¹¹

Linguistic variation within Labovian variationist sociolinguistics has been operationalized in terms of the *linguistic variable* (cf. Labov 1966), which is described succinctly in Poplack & Levey (2010: 398):

“[The linguistic variable] comprises a set of *variants* among which speakers alternate in expressing a given meaning or function. This results in a heterogeneous but structured linguistic system. A foundational working principle is that the structure - grammatical and social - underlying the heterogeneity can be inferred from the distribution and condition of competing variants in discourse.”

Crucial to the understanding of linguistic variables and their variants is the notion that a speaker’s usage or production of particular variants is in essence a recurring *choice*, or a selection of one particular variant as opposed to another (Poplack & Levey 2010: 398). These choices are not completely random, for if they were, this would disallow the very structured heterogeneity or orderly differentiation observable in speakers’ speech (Hickey 2012: 406; Pardo 2012: 754). Instead, a speaker’s selection of a particular linguistic variant for a given linguistic variable is (albeit not completely) predictable, conditioned by “the phonological environment, the syntactic context, the discursive function of the utterance, topic, style, situation and personal and/or sociodemographic characteristics of the speaker or other participants” (Sankoff 1988: 151). Accordingly, subject to *both* linguistic and social constraints, the aggregate production of speakers’ non-randomly varying selection of specific linguistic variants constitutes the normal heterogeneity proposed to characterize a community’s variable linguistic system.

Labovian variationist approaches to language change recognize two additional tenets, namely the fact that language is perpetually or constantly changing (Weinreich et al. 1968:

¹¹ Or, as put by Milroy (1992: 3): “No real language state is a perfectly balanced and stable structure.”

99-100), and the fact that language conveys much more than the meaning of its words (i.e., pervasive social meaning [Weinreich et al. 1968: 186-187], more recently including identity) (Tagliamonte 2006: 5-7). In acknowledging perpetual states of linguistic variation both synchronically and diachronically, as well as the ever-present “social ecology” (cf. Mufwene 2008: 116) in which language use occurs, the Labovian framework seeks to find patterns underlying heterogeneous language use that are accounted for by linguistic and social factors, which correlate with general (or community-wide) social forces (Paredes & Sánchez-Prieto Borja 2008; Romaine 1996; Tagliamonte 2012: 7).¹²

Patterns of linguistic variation, as examined quantitatively since the early 1970s,¹³ reference “a series of parallel occurrences (established according to structural and/or functional criteria) occurring at a non-negligible rate in a corpus of language use” (Poplack & Meechan 1998: 129). Sankoff (1988: 985; though see also Chambers 2003: 17) has defined patterns of linguistic variation as linguistic outcomes (or a dependent variable) that are distributed non-randomly across a set of crossed internal (or linguistic) and external (or social) factors. Synthesizing, we see that the analysis of linguistic patterns underlying variation in language use necessarily considers both linguistic and social contexts that condition the speaker’s use of a particular linguistic variant over another.¹⁴ This emphasis on “the interplay between [linguistic] variation, social meaning, and the evolution and development of the linguistic system itself” (Tagliamonte 2006: 5) echoes the need for an understanding of language use, and indeed language change, as always manifested as

¹² Note that the notion of patterns of linguistic heterogeneity is grounded upon an important distinction between the concepts of homogeneity and structure: “The association between structure and homogeneity is an illusion. Linguistic structure includes the orderly differentiation of speakers and styles through rules which govern variation in the speech community; native command of the language includes the control of such heterogeneous structures” (Weinreich et al. 1968: 187-188).

¹³ One may reference Moreno Fernández (2009: 316-317) for a brief historical overview of methodological and statistical advances in variationist sociolinguistics since the 1970s.

¹⁴ A useful approach for conceptualizing individual speakers’ productions of certain variants over others on a broader, community-wide level is that of the *feature pool* (cf. Mufwene 2008: 117). Under this approach, though speakers in a given speech community share a feature pool, comprised of the total aggregate of possible variants (features) that can be selected for production based on each speaker’s idiolect, each particular selection of a variant remains unique to each speaker.

linguistic variability within a social context. A singular focus on either linguistic or social meaning or function is considered strictly insufficient within a variationist paradigm:

“Linguistic and social factors are closely interrelated in the development of language change. Explanations which are confined to one or the other aspect, no matter how well constructed, will fail to account for the rich body of regularities that can be observed in empirical studies of language behavior” (Weinreich et al. 1968: 188).

In this dissertation, attention will be equally devoted to both linguistic and social factors that mediate lateral velarization and intervocalic fricative voicing in Barcelonan CCS. By exploring how both linguistic and social constraints work in tandem to mediate these phenomena, we will offer further empirical support to show how both kinds of factors operate in conjunction with one another via language variation in a bilingual contact setting that may lead to language change.

1.1.4. Linguistic and Social Factors

As mentioned earlier, language variation and language change are ascribed to a complex interplay between both linguistic or internal constraints (e.g. markedness, phonotactics, language universals, etc.) and social mechanisms (e.g. accommodation, dialect contact, language contact, etc.) in the Labovian variationist framework (cf. Milroy & Milroy 1997; Montoya et al. 1995; Turell Julià 1995; 2000). With respect to the roles of linguistic and social factors in language variation and language change, two rather unambiguous claims are proposed: 1) linguistic innovations need not be motivated *strictly* by linguistic or social factors in a binary dichotomy; rather, linguistic innovations can be motivated *conjointly* by language-internal and language-external factors (and to this point, it has been suggested that it is perhaps best to abandon the pursuit of teasing apart linguistic vs. social motivations

behind an innovation and merely focus on the interplay between them [Dorian 1993; Paredes & Sánchez-Prieto Borja 2008: 25; Romaine 1995; Thomason 2010: 36; Turell Julià 1995: 277]); and 2) *all* language change (or instances of actuation [cf. Weinreich et al. 1968]), regardless of structural motivations, is constrained by social factors and therefore is inherently unpredictable (Hickey 2012: 404; Kammacher et al. 2011: 91; Milroy 2003: 149; Thomason 2008: 49; Milroy & Milroy 1997). Thomason (2010: 33) succinctly paraphrases this crucial point:

“...[I]t remains true that we have no adequate explanation for the vast majority of all linguistic changes that have been discovered. [...] The reason is that, although it is often easy to find a motivation for an innovation, the combinations of social and linguistic factors that favor the success of one innovation and the failure of another are so complex that we can never (in my opinion) hope to achieve deterministic predictions in this area. Tendencies, yes; probabilities, yes; but we still won't know why an innovation that becomes part of one language fails to establish itself in another language (or dialect) under apparently parallel circumstances. ...[T]he realistic goal is a deeper understanding of processes of change, not an ultimate means of predicting change.”

The process by which any innovation is or is not adopted by the community (or *diffusion*, constituting a middle stage in the process of language change) is intrinsically and unquestionably a social phenomenon, reflective of social mechanisms and speaker agentivity (e.g. social networks, gender, age, social class, and/or other sociodemographic characteristics of a speaker group). Consequently, in order to accurately assess a situation of language change (or change in progress), the linguistic behavior of individual speakers must always be situated within an appropriate reference variety, namely that of other speakers of similar sociodemographic background.¹⁵ Indeed, correlates between language use and a set of

¹⁵ The link between sociodemographic background (and social groups in general) and speech is described succinctly by Winford (2003: 26): “Speech communities... can also be identified in terms of social criteria such

relevant social categories have proven exceedingly fruitful in providing a valid means of assessing language change in progress (Milroy 2003: 149; Paredes & Sánchez-Prieto Borja 2008: 32). For instance, with respect to gender-differentiated language trends, the finding that “[w]omen deviate less than men from linguistic norms when the deviations are overtly proscribed, but more than men when the deviations are not proscribed” (Labov 2001: 367) is robust (cf. Chambers 2004; Labov 1990; 2001; Trudgill 1972; Wodak & Benke 1997), recognized as the *gender paradox*. Additionally, with respect to age-differentiated trends, differences between the speech of an older and younger generation of speakers at a single moment in time can be taken as a reflection of longitudinal language differences. In the presence of a curvilinear pattern, these differences are interpreted as potential changes in progress (i.e., innovations diffusing across the community), recognized as the *apparent time construct* (cf. Bailey 2004; Bailey, Wikle, Tillery, & Sand 1991; Chambers 2004; Labov 1963; 1972) and suggested to be even more accurate than longitudinal analyses (cf. Sankoff & Blondeau 2007). Other social correlates such as social class (cf. Labov 1966; 1972; 2001), ethnicity (cf. Labov 1963; 1966; Labov, Cohen, Robins, & Lewis 1968), etc.,¹⁶ offer further confirmation of the integral role that sociodemographic characteristics play in the process of language change.

To synthesize, Labovian variationist theory recognizes the importance of *both* linguistic and social motivations on language change.¹⁷ While it has been proposed (Hickey

as ethnicity, social class, gender, and so on. What unites each of these social constructs is the fact that its members share certain linguistic repertoires and rules for the conduct and interpretation of speech.”

¹⁶ As discussed in Hoffman & Walker (2011: 38), many traditional social categories have undergone considerable revision and examination, including considerations of gender in terms of gender and sexual identity (as opposed to a purely biological/physiological condition) (Eckert 1989; 2000; Podesva 2006), more complex interactions between age (within the apparent time construct) and age-grading (Bailey 2004), a deconstruction of social class into smaller-scale groups via social network analysis (Milroy 1987a; Milroy & Milroy 1992; Villena-Ponsoda 2005) and communities of practice (Eckert & McConnell-Ginet 1992).

¹⁷ The interplay between social and linguistic factors throughout the language change process is aptly characterized by Hickey (2012: 418): “The actuation, propagation, and conclusion of change is determined by social factors, but the linguistic course of a change is connected with structural properties and developmental preferences which exist across languages and which ultimately have to do with language production and processing.”

2012: 417-418) that linguistic innovations resultant from language acquisition in early childhood (that is, the *transmission* [cf. Labov 2007] of a language variety from one generation of speakers to another) are primarily driven by structural forces, in contrast, linguistic innovations during adolescence or later life seem to be more easily shaped by social forces (e.g. accommodation, dialect contact, language contact) alongside structural constraints.¹⁸ This distinction between structural and social motivations for linguistic innovation on the one hand, and the predominantly socially motivated diffusion of linguistic innovations on the other, parallels the distinction proposed in Thomason (2008: 49) between ‘possibility’ and ‘probability’ in language change. The possibility of particular linguistic innovation to occur (i.e., that a speaker will ever produce a particular novel linguistic variant) is linked to the interplay between structural and social motivations. Once a linguistic innovation is uttered, however, the question of language change is no longer of possibilities, but rather of probabilities (i.e., all innovations are capable of being diffused), as rooted in the social dynamics of diffusion (cf. Fagyal et al. 2010). In this dissertation, we explore factors which help account for various degrees of diffusion of CCS [ʔ] and [z] as reflected in their distributions across various speaker groups in the bilingual community, noting that as both features have already been innovated by specific speaker groups, both are fully capable of diffusing and eventually fixating as a new language norm in CCS, given the proper social conditions. Moreover, within the Barcelonan Catalan-Spanish contact setting, special attention is devoted to the role of language dominance (reflected by language exposure and usage) as a primary factor in defining speaker groups.

¹⁸ As claimed in Thomason (2010: 34): “The best explanation for any linguistic change will take all discoverable causal factors into account, both internal and external. The rather extensive literature that attempts to decide between an internal and an external cause of a particular change is a waste of effort - the dichotomy is false, and the best historical explanation might well have to appeal to both causes.”

1.1.5. The Context of Language Contact

Stemming from the aforementioned tradition within historical and comparative linguistics of preferring endogenous analyses of language change over those which involve social forces (in particular, dialect and language contact),¹⁹ the field of contact linguistics has from its conception (cf. Weinreich 1953) been pressed to empirically establish the effects of dialect and language contact (that is, *contact-induced* change) on the emergence or origin of a linguistic innovation and its subsequent diffusion. Indeed, defining and establishing criteria for identifying contact-induced change and/or contact-induced innovation is a recurring theme in the literature:

- Evidence for claiming contact-induced innovation in language A (in contact with language B) includes: 1) “...determin[ing that] the innovation attested in language A has an equivalent feature in language B,” 2) “...consider[ing] whether or not the innovative feature can be attributed to internally-motivated processes. [...] If... internal processes can be invoked as plausible explanations for the innovation in question, this will weaken the case for contact-induced change,” 3) “...consider[ing] other varieties of language A [both varieties in which language A is *not* in contact with another language that exhibits the feature in question, as well as varieties of language A that *are* in contact with other languages that, parallel to language B, happen to exhibit the feature in question] to see if they include the [innovative] feature in question or not,” and 4) “...carefully examin[ing] the distribution of the innovation within the speech community where [the feature in question]... has been documented as a function of factors such as degree of contact or bilingualism. A positive linear correlation with such factors will strengthen the case for contact” (Mougeon, Nadasdi, & Rehner 2005: 103-104);
- “A candidate for contact-induced change in a contact variety is present in the presumed source variety and either 1) absent in the pre-contact variety or non-contact variety, or 2) if present (e.g., through interlingual coincidence), is not

¹⁹ On the point of contact linguistics having to necessarily respond to historical linguists’ preference for purely endogenous linguistic analysis from its conception, we offer the following claim from Winford (2003: 10), the sentiments of which are echoed time and time again in the field (cf. Dorian 1993; Hickey 2012; Romaine 1995; Thomason 2001; 2008; 2010; Thomason & Kaufman 1988; Weinreich 1953): “...for any given contact situation, predictions of contact-induced changes based solely on structural factors fail miserably.”

conditioned in the same way as in the source, *and* 3) can also be shown to parallel in some non-trivial way the behavior of a counterpart feature in the source” (Poplack & Levey 2010: 398; see also Poplack & Levey 2010: 410; Poplack, Zentz, & Dion 2012: 204);

- Evidence for claiming contact-induced innovation in language A (in contact with language B) includes: 1) showing that language A exhibits more than a single (innovative) feature that is found in language B (on the grounds that it’s extremely unlikely that contact results in one isolated and exceptional innovation), 2) showing that language B was in “...sufficiently intimate contact with [language A] to permit the transfer of... features,” 3) “find[ing] some shared features in [languages] A and B... [that] belong to a range of linguistic subsystems, e.g., both phonology and syntax, so as to rule out the possibility of structurally linked innovations in [language A],” 4) “prov[ing] that the features *are* old in [language B] - that is, prove that the features are not innovations in [language B],” and 5) “prov[ing] that the features are innovations in [language A], that is, that they did not exist in [language A] before [language A] came into close contact with [language B]” (Thomason 2010: 34; see also Thomason 2001: 93-94; 2008: 49-50).

Analyses of language variation and change, from a perspective of language contact (cf. Mougeon et al. 2005; Poplack et al. 2012; Poplack & Levey 2010; Thomason 2001), incorporate these aforementioned criteria as a means of empirically substantiating the role of contact in a given linguistic variant’s innovation and subsequent selection and diffusion. These criteria, while comprehensive, seem to suggest that if any one parameter is not met, then the case for contact is considerably if not completely weakened, favoring an account that appeals to linguistic and social factors completely independent of language contact.

Nevertheless, Thomason (2008: 47; see also Thomason 2010: 32) shifts the discussion towards the role of language contact in the innovation process using language of a considerably less absolute nature: “Contact is *a* source of linguistic change if it is *less likely* that a given change would have occurred outside a specific contact situation” (original italics preserved). Following this approach to language contact, an empirical examination of

language contact effects in the innovation process does not hinge upon all of the aforementioned parameters being met, but rather takes them into consideration alongside linguistic and other social factors as a whole. This is precisely the more nuanced and holistic approach that we follow in this dissertation, exploring language variation and change in the Spanish of Catalonia by conjointly analyzing the influence of Catalan in the phonetic domain of Spanish alongside structural mechanisms and language (or cross-linguistic) universals operating within the Spanish language independent of contact with Catalan, as well as their interaction. This consideration of language contact as one possible motivation for the emergence and subsequent selection of a particular linguistic innovation allows for a direct parallel with theories of language change across the fields of Labovian variationist sociolinguistics, language variation and change, and contact linguistics: all analyze cases of the diffusion of linguistic innovations as arising from an interplay between social and linguistic forces (cf. Weinreich 1953: 5; Winford 2003: 26), treating language contact as one of various motivations driving the innovation and subsequent actuation of a given linguistic feature.

1.2. Contact Linguistics

Research within contact linguistics (cf. Haugen 1950; Thomason 2001; Thomason & Kaufman 1988; Van Coetsem 1988; 1995; 2000; Weinreich 1953; Winford 2003; 2005) has traditionally centered on a discussion of the kinds of linguistic innovations that can occur when two or more language varieties are in contact with one another, and if all innovations (across all grammatical domains [e.g. phonology, syntax, morphology, lexicon, etc.]) have an equal probability for occurring in various types of contact situations. Linguistic innovations resultant from language contact (henceforth referred to as *contact innovations*) are described with reference to the language varieties in contact: if a feature native to language variety B

and originally absent in language variety A is adopted in language variety A as a contact innovation, language A is deemed the ‘recipient’ language variety (RL) and language B the ‘source’ or ‘donor’ language variety (SL).

1.2.1. Speaker Agentivity in Contact Situations

Within Van Coetsem’s (2000) framework of language contact, contact innovations unidirectionally transfer from the source language variety (SL) to the recipient language variety (RL), and can be distinguished with respect to the agents of the innovation itself. Instances in which native speakers of the SL (or SL-dominant speakers) transfer a particular feature into the RL are termed *impositions*. Impositions (also considered substratum interference [particularly within second language acquisition research], push transfer, or L1-to-L2 transfer) reflect *SL agentivity*, in which bilingual speakers carry linguistic features of their L1 (or more dominant language) into their L2 (or less dominant language).²⁰ In contrast, instances in which native speakers of the RL (or RL-dominant speakers) transfer a particular feature from the SL into the RL are labeled *borrowings*.²¹ Borrowings (also considered pull transfer or L2-to-L1 transfer) reflect *RL agentivity*, in which bilingual speakers adopt linguistic features of their L2 (or less dominant language) into their L1 (or more dominant language) (Van Coetsem 2000: 49).²²

The distinction between RL and SL agentivity (and thus borrowing and imposition,

²⁰ Van Coetsem (2000: 55) offers the example of a French speaker (L1) incorporating select English words into his or her French as RL agentivity, or borrowing: “[The speaker] thus transfers material from English, the SL, to his own French, the RL. This is a pull transfer, referred to as RL agentivity or borrowing. In RL agentivity (borrowing) the agent speaker performs a pull transfer that affects his own, linguistically dominant language.”

²¹ Thomason & Kaufman (1988: 37) offer a comparable definition of borrowing: “...the incorporation of foreign features into a group’s native language by speakers of that language: the native language is maintained but is changed by the addition of the incorporated features.”

²² Van Coetsem (2000: 55-56) offers the example of a French speaker (L1) learning English and imposing French phonetic categories onto his or her English as SL agentivity, or imposition: “[The French native speaker] may acquire the English word *pear* and pronounce the [p-] without aspiration. ...[W]e should say that he transfers his French [p-] (SL) to his realization of English (RL), i.e., that he imposes his French [p-] upon English. [...] This is a push transfer, referred to as SL agentivity... In SL agentivity (imposition) the agent speaker performs a push transfer that affects a language other than his own, linguistically dominant language.”

respectively) has been proposed to reflect two unique contact scenarios. For Thomason & Kaufman (1988), situations of borrowing, under RL agentivity, most typically consist of cases in which bilinguals native (or dominant) in the RL incorporate lexical items from the SL into the RL, as opposed to syntactic or phonological contact innovations (Thomason 2008: 48). In contrast, impositions are treated as outcomes derived from the imperfect learning of a second language (in this case, the RL), and most typically consist of a case in which bilinguals native (or dominant) in the SL incorporate syntax and phonology from their L1 into their less dominant second language (the RL) (Thomason 2008: 48). These outcomes are succinctly summarized in Thomason (2010: 36):

“When the agents of change are fluent speakers of the RL, the first and predominant interference features are lexical items belonging to non-basic vocabulary; later, under increasingly intense contact conditions, structural features and basic vocabulary may also be transferred from one language to the other. [...] The prediction for the outcome of contact situations in which one group of speakers [...] fails to learn [the other language] fully, stands in sharp contrast to a situation in which imperfect learning plays no role: ...the first and predominant interference features are phonological and syntactic; lexical interference lags behind, and in some cases few or no lexical items are transferred...”

Van Coetsem (1988: 25) offers a similar analysis of the typical cases of borrowing and imposition, attributing differences to the ‘stability gradient of language,’ or the notion that certain domains of linguistic structure tend to be either more or less stable (or resistant) to contact innovation than others (Winford 2005: 377). Phonology (alongside phonetics) and syntax are claimed to be more stable and thus resist contact innovation, whereas the lexicon, for example, tends to be less resistant to contact innovation. Accordingly, instances of borrowing primarily constitute lexical innovations that do not affect deeper structures of the RL grammar, whereas cases of imposition, in contrast, can cause “catastrophic

modification[s]” in the RL grammar (Van Coetsem 1988: 20), even in scenarios of relatively weak language contact intensity. Arnal (2011: 7-8) offers a succinct summary of this stability gradient of language:

“The concept of stability gradient of language is based on the fact that, in a language-contact situation, the more stable elements (such as phonology, morphology and syntax) are more resistant to change than the less stable elements (such as vocabulary). Thus, in borrowing (RL agentivity), source language vocabulary (less stable) and occasionally grammatical material are transferred from the source language to the recipient language. The speaker modifies neither the phonology nor the syntax (i.e. the more stable elements) of the language in which he is more proficient. But in imposition (SL agentivity), the transfer from the language in which the speaker is more proficient to the language in which he is less proficient does involve phonology and syntax. That is, source language grammatical material and an important part of phonology are or may be transferred (i.e. imposed) upon the recipient language, which is the language in which the speaker is less proficient.”

What remains to receive ample attention, however, is the process by which these contact innovations are incorporated into the RL and their native-speakers. Accordingly, this dissertation focuses on the usage patterns and attitudes regarding two phonetic features of Catalan Spanish in order to more clearly articulate this process, particularly as linked to the interplay between linguistic and social mechanisms involved in language variation and change. Moreover, different types of bilingual speakers are incorporated into our analysis of variation of CCS [ʎ] and [z] in order to show how processes of language change in contact situations are necessarily mediated by bilinguals of distinct language profiles. Crucially however, as will be elaborated further in section 1.3, the present scenario of Catalan-Spanish contact deviates somewhat from the cases of imposition and borrowing outlined by Van Coetsem (2000) in that in Barcelona, speakers of Catalan are often not sequential bilinguals, but rather instead develop simultaneous bilingualism from birth, within the home.

Accordingly, though we continue to make references to Van Coetsem's (2000) model, it is perhaps more appropriate to discuss phonetic transfer in terms of contact influence, rather than impositions (or interference), which traditionally have been commonly applied to situations of sequential bilingualism and second language acquisition.

1.2.2. Linguistic and Social Factors in Contact Innovations

Importantly, the aforementioned common outcomes of contact-induced change (which can be interpreted as predictions for contact scenarios) are just tendencies, and far from absolute (Thomason 2008). Parallel to any theory of language change, research in contact linguistics does not claim to predict what contact-induced changes do or do not take place, as both linguistic innovation (understood as motivated conjointly by language-internal and language-external factors) as well as diffusion (understood as an unpredictable and dynamic social phenomenon) are inherently complex and unpredictable (Thomason 2008: 54; 2010: 32-33). Accordingly, several factors (both linguistic and social) have been proposed in order to account for the full range of contact innovations (spanning across the categories of borrowings and impositions) that have been observed in the field of contact linguistics (cf. Poplack & Levey 2010; Romaine 1995; Thomason 2001; 2010; Thomason & Kaufman 1988; Winford 2003).²³

With respect to the present investigation of Catalan-Spanish contact, several factors are relevant: 1) typological distance: the relatively small distance between the languages (elaborated further in section 1.3.1) suggests that the likelihood for contact-induced change is

²³ A series of less typical borrowing outcomes, for example, given the proper or conducive social and linguistic circumstances, is offered in Thomason (2001: 71) from an admittedly somewhat extreme position: "Anything goes, including structural borrowing that results in major typological changes in the borrowing language. In phonology, loss or addition of entire phonetic and/or phonological categories in native words and of all kinds of morphophonemic rules. In syntax, sweeping changes in such features as word order, relative clauses, negation, coordination, subordination, comparison, and quantification. In morphology, typologically disruptive changes such as the replacement of flexional by agglutinative morphology or vice versa, the addition or loss of morphological categories that do not match in the source and borrowing languages, and the wholesale loss or addition of agreement patterns."

higher than if the languages were less typologically related; however, since such changes may be harder to detect due to the high similarity between the languages, phonetic innovations will help highlight contact influence; 2) length and intensity of contact: as the amount of time during which Catalan and Spanish have been in contact is considerable (elaborated further in section 1.3.1) and has led to widespread bilingualism, this increases the likelihood that contact-induced change, particularly in the form of structural transfers, will occur; 3) language status: the minority language, Catalan, has a higher likelihood to be the RL for contact-induced change than if it were a majority language (though Catalan within Catalonia does not constitute a marginalized minority language, as elaborated in section 1.3.2); 4) sociocultural pressure: the language used by a subordinated sociocultural group (historically Catalan, as elaborated in section 1.3.1) is more likely to be the RL than if it were the language of the dominant sociocultural group; 5) population size: the language spoken by a greater portion of the population (namely Spanish, though this depends the geographic region under consideration, as discussed in section 1.3.2) has a higher likelihood of acting as the SL than if it were spoken by a smaller portion of the community; additionally, since Catalan enjoys widespread use both in the public sphere as well as in private (home) spheres, many speakers in this community are bilingual from birth and develop dominance in Spanish or Catalan as opposed to communities in which SL speakers are L2 speakers of the SL; 6) language attitudes: if attitudes toward Catalan (as the SL for possible phonetic contact innovations) are sufficiently negative, this will serve to impede the diffusion of contact variants from Catalan into Spanish; however, as Catalonia is a prosperous economic autonomous region in which Catalan enjoys certain social prestige (elaborated further in section 1.3.2), social pressures to maintain the language and positive attitudes toward it are expected to facilitate contact innovations from Catalan into Spanish.

In summary, Van Coetsem's (2000) framework for language contact posits two

distinct categories of contact-induced change, namely borrowing and imposition, which respectively reflect outcomes of RL or SL agentivity. These kinds of contact-induced change have been correlated with a variety of linguistic and social factors that, in conjunction with one another, can facilitate predictions regarding the kinds of contact-induced change that are more or less likely for a particular scenario of language contact. With respect to this dissertation's examination of the emergence and subsequent possible diffusion of two phonetic variants of CCS amongst the bilingual Catalan-Spanish community, the scenario in which Catalan-dominant bilinguals are the agents behind the emergence of Spanish [t] and [z] fits the description of a case of contact influence (SL agentivity, L1-to-L2 transfer) in which features from (L1-)Catalan are transferred into their (L2-)Spanish. Accordingly, the bilingual speaker dominant in the SL would be considered the *innovator* (cf. Weinreich et al. 1968) in this scenario of Catalan-Spanish contact (Arnal 2011: 6; Milroy 2002; Poplack & Levey 2010: 396; Thomason & Kaufman 1988; Thomason 2001; 2008; 2010; Weinreich 1953; Winford 2005). In this dissertation, Catalan-dominant bilinguals in distinct settings of either Spanish or Catalan prevalence, in addition to Spanish-dominant bilinguals are considered in order to better uncover the process by which contact innovations may diffuse in a bilingual community.

1.3. Socio-historical Background of Catalan and Spanish in Catalonia

1.3.1. Historical Overview of the Languages of Catalonia

Descendent directly from Latin, Spanish and Catalan constitute the two Romance languages currently spoken natively in Catalonia, Spain. Whereas Spanish is unproblematically classified as a member of the Ibero-Romance language family (Fleischman 1992; Green 1988), the placement of Catalan in a linguistic lineage tree from Latin is more difficult. Some claim it to be a member of the Gallo-Romance family due to its ties with Occitan, while

others deem it a member of the Ibero-Romance family due to its ties with Spanish (Vallverdú 1984: 13).²⁴ Nonetheless, Catalan most likely originated in the Pyrenean territory of Northeastern Spain and Southwestern France and is spoken natively by approximately ten million speakers hailing from Spain, France, Andorra, and Italy (Àngel Pradilla 2001: 58; Council of Europe 2014: 5; Marí 2014: 58; Vallverdú 1984: 13).

Vallverdú (1984: 14-15) notes that the period of 900 to 1137 was marked by the gradual independence of Catalan counties from Frankish emperors under the consolidated rule of the Count of Barcelona, who shifted the economic and social center of Catalan society from the Pyrenees Mountains to the city of Barcelona. Turell Julià (2000: 44-45) notes that both literacy and the diglossic use of Latin (as the high variety [henceforth H]) alongside Early Catalan (as the low variety [henceforth L]) were restricted to clerics and the noble class, whereas the common language used daily amongst the greater population was Early Catalan (cf. Ferguson 1959; Fishman 1967; 1971; Schiffman 1997). In 1137, however, the Count of Barcelona, Ramon Berenguer IV, became the King of Aragon through marriage to Petronilla of Aragon, officially forming the Crown of Aragon (or the Arago-Catalan Kingdom) (Gimeno Betí 2005: 67; Vallverdú 1984: 15).

The rise of Catalan as a distinct language from Vulgar Latin (alongside the concurrent loss of spoken Latin) is dated toward the start of the Arago-Catalan Kingdom, in the 12th century, coinciding with the appearance of a series of canonical Catalan literary texts, such as *Homilies d'Organyà* and a Catalan version of *Forum Iudicum* (Gimeno Betí 2005: 70; Àngel Pradilla 2001: 59; Turell Julià 2000: 44-45; Vallverdú 1984: 16). As Turell Julià (2000: 45) notes, these societal-wide linguistic changes were influential in the cohesion of Catalan identity and linguistic awareness:

²⁴ For a discussion on the historically vacillating treatments of Catalan as a member of Ibero-Romance or Gallo-Romance, one may reference Duarte i Montserrat & Alsina i Keith (1984: 18-21).

“...the period between the 12th and the 15th centuries can [...] be described in relation to Catalan [...] by two fundamental facts: one, a growing awareness of the Catalan linguistic identity, and the other, the beginning of a long process which would take Catalan into spaces or domains of language use that Latin had occupied until then, or into domains of usage; these include: access of Catalan to writing and to written literature.”

Under formal conquests led by King Jaume I in the late 12th and 13th centuries, the Arago-Catalan Kingdom expanded to modern-day Lleida and Tortosa, Valencia, and the Balearic Islands. Not long after, from 1323 to 1354, the island of Sardinia fell to Catalan troops under King Peter III. With respect to language use, however, bilingualism in Catalan and Aragonese was restricted to members of the royal crown, as the individual territories within the Kingdom functioned as autonomous units. Accordingly, Catalan was the language of Catalonia, Roussillon, the greater portion of Valencia, the Balearic Islands, and the city of Alghero, Sardinia, whereas Aragonese was used in Aragon and a smaller (Western) portion of modern Valencia (Argenter 2008: 209; Blas-Arroyo 2007: 82; Gimeno Betí 2005: 102; Nadal & Prats 1982: 441-442; Vallverdú 1984: 16; Vila-Pujol 2007: 61).

Catalan continued as the common (and by all practical considerations, the *only* and national) language of Catalonia 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) (Turell Julià 2000: 46; Vallverdú 1984: 19). Though the former territories of the Arago-Catalan Kingdom retained a considerable degree of autonomy under the Spanish Crown, they saw a gradual but steady increase in Spanish and Castilian culture, particularly as fueled by the Spanish Inquisition in the 15th and 16th centuries. This alliance between the kingdoms in fact marked the beginning of a gradual rise of Spanish power throughout the Peninsula, competing with Catalan in territories formally part of the Arago-Catalan Kingdom. Though the status of Catalan as the H language in

Catalonia was not definitively challenged until the Spanish War of Succession in the early 18th century, Vallverdú (1984: 20; see also Àngel Pradilla 2001: 61; Vila-Pujol 2007: 61) nevertheless notes that the introduction of Spanish into the region set the stage for a new kind of diglossia between Spanish and Catalan:

“Granted that Catalan did not lose all its positions as H language, nevertheless its stability as the national language began to be shaken: the diversifying tendencies relaxation of standards, gradual loss of consciousness of linguistic unity, etc. prevailed over those of unification, and the aristocracy and some intellectuals abandoned it as the common language. In fact if the immense majority of the population was unilingual, if Catalan was still used as the official language in public institutions, if the cultivation of Catalan literature continued (though on the wane and of low quality), the truth is that Castilian nevertheless assumed an H role of increasing importance, while Latin also regained some of its former functions. [...] These centuries, then, saw the beginning of the present-day linguistic conflict in the form of a confrontation between two sectors of society: on the one hand the popular classes (agricultural workers, laborers, craftsmen) and sectors of the bourgeoisie, who spoke only Catalan and understood nothing (or little) of Castilian; and on the other the ruling classes and those intellectuals who were diglossically bilingual.”

Resultant from the Spanish War of Succession in 1714, Castilian King Phillip V (first king of the Bourbon House) 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 (Blas-Arroyo 2007: 82-83; Àngel Pradilla 2001: 61; Vila-Pujol 2007: 62). Diglossic bilingualism became increasingly more widespread, with Spanish assuming the role of the H language and Catalan the L language. Bilingualism (in the sense of the acquisition of Spanish) extended from the upper classes down through the middle and lower classes, particularly after the Moyano Law of 1857 that imposed compulsory public education taught in Spanish (Mas i Miralles 1993: 244; Vallverdú 1984: 21; Vila-Pujol 2007:

63).

It was not until the early 20th century when Spanish Crown faced two nationalist Catalan uprisings (and their corresponding periods of autonomous, self-government) centered in Catalonia, which although short-lived, motivated a powerful cultural revival of Catalan alongside the formal standardization of the language and the creation of the *Institut d'Estudis Catalans* in 1907 (Turell Julià 2000: 46-47; Vallverdú 1984: 23). The uprisings grew out of a period of political and social unrest, particularly in Catalonia, as motivated by “...the failure of the Catalan bourgeoisie to secure the position of hegemonical force in the Spanish State, fettered by its incapacity for self-modernization due to the predominance in its ranks of the centralist, landowning oligarchy” (Vallverdú 1984: 22). Both uprisings, namely the *Mancomunitat* (1914-1925) and the *Generalitat* (1931-1939), were quelled by Spanish military forces (for the former, by General Primo de Rivera, and for the latter, by General Francisco Franco). These events took place during a period of literary revival for Catalan, known as the *Renaixença*, in which Catalan first appeared in newspapers, began a gradual entry into universities and scientific academies, and during the years of the *Generalitat*, reoccupied its official status and roles in public administration, schools, and communication media (Newman, Trenchs-Parera, & Ng 2008: 307; Àngel Pradilla 2001: 62-63; Vallverdú 1984: 23; Vila-Pujol 2007: 63). Accordingly, during the duration of the *Generalitat* (amidst a Spanish Democratic Republic) until 1939, Catalan recovered all of its formerly lost functions as an H language, restoring Catalan as the common language of Catalonia, while simultaneously placing Spanish as a language geared more toward relations with the rest of Spain (Vallverdú 1984: 23).

The end of the Civil War (1939), however, brought about an oppressive and fascist Spanish government under the direction of General Francisco Franco, who until his death in 1975 led Spain in a traditional centralist campaign to unify the country. The reincorporation

of Catalan territories was accomplished through the elimination -or complete Castilianization- of all Catalan public institutions, as well as the restoration of Catalonia as one of four Spanish provinces. Catalan was stripped of official status, being completely prohibited in the public sphere. This, in an atmosphere of Catalan book-burning and bookstore arson, effectively restricted the use of Catalan to the private spheres of family and friends until Franco's death (Arnal 2011: 15; Newman et al. 2008: 307; Àngel Pradilla 2001: 63; Turell Julià 2000: 47; Vallverdú 1984: 24; Vila-Pujol 2007: 64). Though Vallverdú (1984: 24-25) argues that Catalan remained an H language during the Franco dictatorship in family circles, select coteries, and clandestine meetings, massive waves of monolingual Spanish immigration during the mid-20th century to Catalonia only further reinforced the relative elimination of Catalan as a common language. Spain experienced an economic boom during the latter half of the 20th century that encouraged waves of non-Catalonian immigrants (primarily from rural, monolingual regions of Southern and Central Spain) to Catalonia, a dominant industrial Autonomous Region (Muñoz 2005: 76; Trenchs-Parera & Newman 2009: 509; Vila-Pujol 2007: 63; Vallverdú 1984: 26; 1991: 21). More specifically, more than two million non-Catalonian immigrants moved to Catalonia between the years of 1950 to 1975, such that by the late 1970s, over 42% of the population of Catalonia ages 6 and older were Spanish immigrants (Arnal 2011: 13, 23; Gifreu 1983: 298; Strubell i Trueta 1984: 92; Woolard & Gahng 1990: 314). Additionally, fewer than half of all non-Catalonian immigrants learned to speak or write in Catalan after 1950 as a result of the prohibition of Catalan until Franco's death in 1975 (Vallverdú 1991: 21). As Vallverdú (1984: 24) notes, "The prohibition was so drastic that the first newspaper to be published in Catalan after the [civil] war did not appear until 1976 - one year after Franco's death!"

Most recently, Spain's democratic post-dictatorship and democratic period is marked by a series of dramatic changes in governmental policy. First and foremost, Spain adopted a

parliamentary democracy with a comparatively less-centralized organization, dividing Spain into a set of quasi-federal Autonomous Communities (Newman et al. 2008: 308) Accordingly, the (Catalonian) Generalitat was officially restored in 1977, and in 1980 the first elections were held for the Catalan parliament (Vallverdú 1984: 25; Woolard & Gahng 1990: 314). The Spanish Constitution of 1978 declares Spanish as the only official national language of Spain, and that all Spaniards have an obligation to know Spanish. The other 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 Julià (2000: 47-48) remarks that the Spanish Constitution reflects a conception of Spain in which Catalan, Basque, and Galician are not a question of the State, an analysis which is corroborated by claims that the Spanish Constitution consigns these minority languages to asymmetric bilingualism in their respective Autonomous Communities (cf. Newman et al. 2008: 308; Turell 2001; Vila i Moreno, Vial, & Galindo 2005).

More specifically, in 1983, the Generalitat passed the *Llei de Normalització Lingüística* ‘Law of Linguistic Normalization,’ which sought to reverse Catalan’s prior status of linguistic inferiority to Spanish. It declared Catalan the language of the Generalitat and all public institutions falling under its jurisdiction, recognized the rights of all citizens to be able to address the administration, public and private companies, and all judicial entities in Catalan, reinstated the use of Catalan for the writing of public documents, proposed the creation of mass media in Catalan, and introduced education reform to increase the presence of Catalan in schools, which since 1978 included only 3 hours of public school instruction obligatorily in Catalan (Àngel Pradilla 2001: 77; Vallverdú 1984: 64; Vila-Pujol 2007: 69; see also Vann 1999a: 318). A series of additional educational legislative policies (see Muñoz 2005; Àngel Pradilla 2001 for further details) were later enacted in the late 80s and 90s to

continually increase the presence of Catalan in schools to reflect the current system's educational main objective: to ensure that all students are "able to use both Catalan and Castilian normally and correctly at the end of their compulsory education" (Huguet 2006: 155). The most recently passed educational policy, Act 12, was passed on July 10, 2009 and "ensure[s] that the entire school population, whatever their habitual language when entering the education system, complies with the duty and exercises the right to achieve oral and written proficiency in Catalan and Castilian" (Council of Europe 2014: 6-7).

Presently, public education in Catalonia is predominantly offered in Catalan with Spanish studied as a second language, with the predominant alternative (in Barcelona) being that both languages are taught and used equally throughout the curriculum. Notably, the lack of public education programs in which Spanish is the medium of instruction and Catalan is only studied as a second language is reflective of the initial failure regarding Catalan acquisition by children attending such programs in the early 1980s, with as many as 40% of students claimed unable to use Catalan after primary school (Huguet 2006: 155; Muñoz 2005: 79; Vann 1999a: 319). As synthesized by Vila i Moreno (1997: 17 [as cited in Vann 1999a: 319]), "...due to the social predominance of Castilian in most of Catalonia, Catalan-speaking children acquire a good command of Castilian irrespective of the school they attend but Castilian-speaking children only learn Catalan in predominantly Catalan-medium schools."

In summary, as a result of the considerable changes in governmental policy since the Franco regime, particularly as related to educational reform and the active and preferential support for Catalan in the public spheres, bilingualism in Catalan and Spanish (primarily from the home) is presently the overwhelming norm in Catalonia (see table 1 in section 1.3.2). In fact, the Generalitat even offers free language classes in Catalan to immigrants interested in acquiring the language. As a result of the extensive presence of Catalan-speakers and

Catalan as a co-official language with considerable media presence in Catalonia, all residents of Catalonia presently develop a degree of bilingualism in Catalan (see table 1 in section 1.3.2), however minimal and/or passive for some (Báez de Aguilar 2008: 106-107; Boix i Fuster & Vila i Moreno 1998: 222; Wesch 1997: 294). Nevertheless, it is important to continue to consider the tremendous advances toward the restoration of Catalan in Catalonia always alongside the continued existence of asymmetric bilingualism, as described by a former head of language policy of the Generalitat: "...[I]t is still not entirely possible, nor simple, nor comfortable to live in Catalan in Catalonia, but it is perfectly possible to do so exclusively in Spanish" (Pueyo 2006: 39, as cited in Newman et al. 2008: 307).²⁵

1.3.2. Language Use in Catalonia

As discussed in the previous section, the large population movements towards Catalonia by monolingual Spanish-speaking immigrants in the mid-20th century have dramatically increased the relative presence of Spanish in this bilingual territory, and have been an impetus for sweeping educational reform to promote the acquisition of Catalan specifically amongst the L1-Spanish population. The success of these reforms is quite transparent: in 1975, 83% of the population of the province of Barcelona identified themselves as having no understanding of Catalan (Consonci 1978, as cited in Arnal 2011: 14). Only six years later, in 1981, census data reveal that this figure dropped to 21.63%, and has nearly unilaterally decreased with each census, from 10.71% in 1986 to 7.14% in 1991, to 5.7% in 1996, to 5.96% in 2001, and to 4.99% in 2011 (Institut d'Estadística de Catalunya 2014).²⁶

²⁵ Anecdotally, one finds support for this sentiment in ongoing advertising campaigns by *Plataforma per la Llengua*. This Catalan NGO distributes print media to bolster Catalan in Barcelona and has a series specifically encouraging the use of Catalan with construction workers (insisting that they speak Catalan and should be spoken to in Catalan), in film (encouraging an outcry over the minuscule amount of films and subtitles for films available in Catalan as opposed to Spanish), and with foreign immigrants to Catalonia.

²⁶ The slight increase in speakers with no understanding of Catalan between the census data from 1996 and 2001 corresponds to another particularly strong influx of non-Catalonian immigrants to Catalonia between 1998 and 2002 (González & Lázaro y Torres 2005: 40).

Competence trends for the capital of Barcelona show similar levels of Catalan competence by L1-Spanish speakers. The most recent linguistic census data available, for 2013, reveal that only 4.1% of L1-Spanish speakers claim no understanding of Catalan, whereas absolutely all L1-Catalan speakers, as well as speakers claiming both Catalan and Spanish as native languages, report understanding Spanish (Institut d'Estadística 2014). The complete breakdown of self-reported competence in Catalan and Spanish according to native language both in the urban capital of Barcelona and in Catalonia overall (ages 15 and older) is found below in table 1.

Table 1: 2013 Population (%) Ages 15+ with Competence in Catalan and Spanish by L1

	Native Language	Understands Catalan / Spanish	Speaks Catalan / Spanish	Reads Catalan / Spanish	Writes Catalan / Spanish
Barcelona (City)	Catalan	100 / 100	100 / 100	99.5 / 99.7	87.2 / 99.7
	Spanish	95.9 / 100	76.9 / 100	81.2 / 99.2	51.2 / 98.4
	Catalan and Spanish	100 / 100	100 / 100	100 / 96.3	82.3 / 96.3
	Another Language	73.2 / 98.3	43.6 / 98.3	49.7 / 91	20.2 / 85.6
	TOTAL	94.5 / 99.8	80.4 / 99.8	83.5 / 98.3	59.1 / 97.2
Catalonia	Catalan	100 / 99.9	99.8 / 99.7	98.2 / 99.3	86.1 / 98.6
	Spanish	94.4 / 100	74.3 / 100	78.1 / 98	50.7 / 97
	Catalan and Spanish	100 / 100	99.6 / 100	98.9 / 99	83.2 / 99
	Another Language	76.6 / 98.8	50.9 / 98.2	56.3 / 89.8	28.6 / 82.1
	TOTAL	94.3 / 99.8	80.4 / 99.7	82.4 / 97.4	60.4 / 95.9

Source: Institut d'Estadística de Catalunya 2014

While the differences in self-reported Catalan competence between Barcelona and Catalonia shown above are far from disparate, Barcelona is unique with respect to actual (habitual) language use and sheer numbers of L1-Catalan speakers. Renowned for having the lowest presence of Catalan and fewest number of L1-Catalan speakers in all of Catalonia (Lleó, Cortés, & Benet 2008: 186), in Barcelona (Metropolitan Area, henceforth referred to by region as BMA) approximately 23% of the current (2013) population are L1-Catalan

speakers, compared to approximately 64% L1-Spanish speakers²⁷ (Institut d'Estadística 2014). Moreover, although there are currently (in 2013) over 600,000 (~8% of total population of Catalonia [of 7,553,650]) non-native speakers of Catalan who use Catalan as their habitual (i.e., most frequently used) language in Catalonia, (i.e., native speakers of Spanish or another language that 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 de Catalunya 2014: 4, 7; Institut d'Estadística de Catalunya 2014). A comparison of these values for Barcelona with those reported in 2013 for Catalonia, as well as those for Catalonia excluding Barcelona is offered below in table 2. Additionally, a map of the seven regional territories of Catalonia is provided below as figure 1, highlighting the urban capital city of Barcelona within the BMA. Note that bilingual participants recruited for the present investigation all hail from within the BMA, either from the capital or from smaller, more rural villages along the outskirts of the BMA.

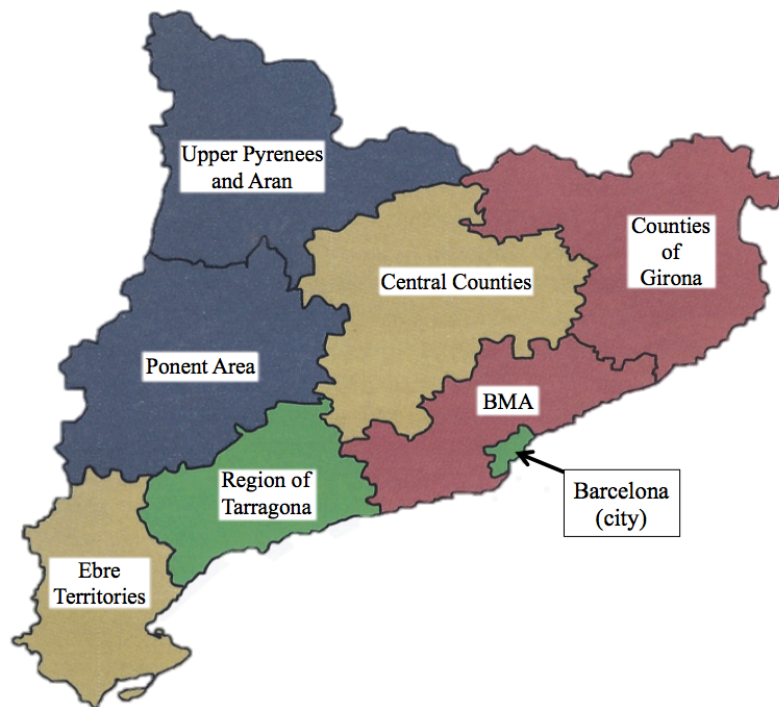
Table 2: 2013 Population (%) Ages 15+ with Catalan and Spanish as Native or Habitual Language

		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

Source: Institut d'Estadística de Catalunya 2014

²⁷ 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.

Figure 1: Map of the Seven Regional Territories of Catalonia



Adapted from Generalitat (2009: 14; 2011: 38)

A careful examination of the differences in language percentages across the columns in table 2 reveals that were it not for the BMA region, Catalan would be a more common language than Spanish in Catalonia (both in terms of L1-speakers as well as habitual language users) (see also Vila-Pujol 2007: 64). The predominance of Spanish in the BMA (and the city of Barcelona in particular)²⁸ directly reflects immigration patterns that have been consistent since the mid-1950s. That is, recent immigration trends since the start of the 21st century largely echo those of the mid-20th century inasmuch as the BMA region continues to receive more non-Catalonian immigrants than all six other regions of Catalonia combined.

The most recent (2013) census data reveal that there are over a million immigrants from Spain (primarily L1-Spanish monolinguals [i.e., not native to the Basque Country or Galicia]) in the BMA, constituting approximately 21% of the population. This is roughly 10

²⁸ 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).

times as many as found in the region with the next to highest population of Spanish immigrants, Tarragona. Moreover, the BMA currently is home to over 800,000 foreign (non-Spanish) immigrants, constituting approximately 17% of the BMA population. This is roughly 5 times as many as found in the region with the next to highest population of foreign immigrants, the Counties of Girona (Institut d'Estadística 2014). A comparison of these values for the BMA with those reported in 2013 for the city of Barcelona, as well as those for the BMA excluding the city of Barcelona is offered below in table 3.

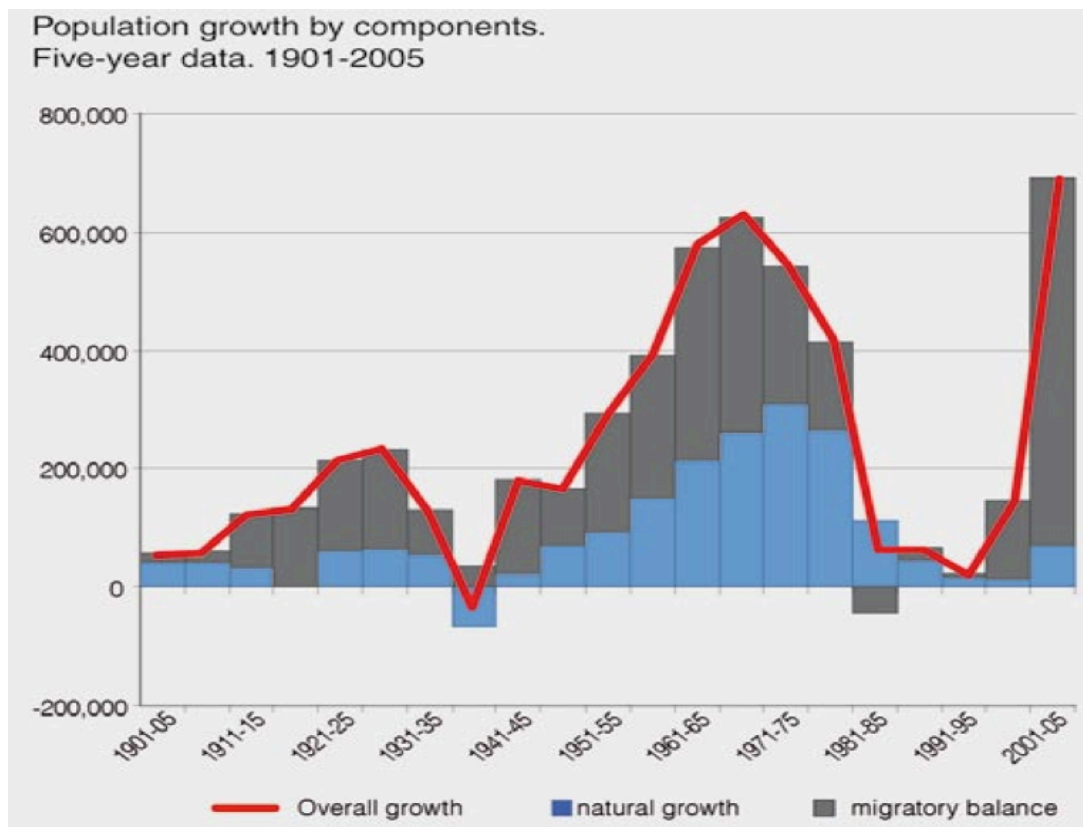
Table 3: 2013 Non-Catalonian Population (%) Ages 15+ in BMA and Barcelona

	Barcelona (City)	Barcelona Metropolitan Area	BMA Excluding Barcelona
Spanish Immigrants	19	20.97	21.97
Foreign Immigrants	21.79	17.19	14.86
TOTAL	40.79	38.16	36.83

Source: Institut d'Estadística de Catalunya 2014

Foreign immigration to Catalonia, and particularly the BMA and the city of Barcelona, continues to remain high. The most recent and one of the largest periods of population growth in Catalonia, attributed principally to foreign immigration, is that from 2001 to 2008, in which the total number of foreign immigrants surpassed one million for the first time in Catalonia's history, constituting approximately 15% of the total population in 2008 (Generalitat 2009: 9). Figure 2, below, illustrates this recent period of population growth in Catalonia in comparison with that from the mid-20th century, showing that 21st century immigration to Catalonia drastically overshadows natural growth patterns from within the autonomous community.

Figure 2: Population Growth in Catalonia from Natural Growth and Immigration



Source: Generalitat (2009: 3)

With respect to foreign immigration to the city of Barcelona, the BMA, and Catalonia overall, the largest group of immigrants continues to hail from Latin America (principally from Ecuador, followed by Colombia, Bolivia, Argentina, and Peru, all of which are Spanish-speaking) (Instituto Nacional de Estadística 2014; Generalitat 2009: 9). The most recent (2013) census data for the city of Barcelona reports over 230,000 immigrants (roughly 5% of the city population) hailing from North, Central, and South America, constituting the majority (at 28.5%) of all foreign immigration (Institut d'Estadística 2014). Though this figure problematically includes (non-Spanish-speaking) immigration from the United States and Canada, it is worth noting that census data from 2007 for Catalonia did in fact separate out these two countries and found that they comprised less than 2% of all immigration from the Americas (Instituto Nacional de Estadística 2014). It is therefore appropriate to conclude that the majority of all foreign immigrants to Barcelona presently is and continues to be

Spanish-speakers from Latin America, as echoed by Trenchs-Parera & Newman (2009: 509) and Generalitat (2009: 9).

In summary, the predominance of Spanish habitual language use and L1-Spanish speakers in the BMA and the city of Barcelona are a direct consequence of a history of waves of Spanish-speaking immigrants to these areas of Catalonia, first by Spanish immigrants in the mid-20th century and later by Latin American speakers of Spanish in the 21st century, especially from South America and the Andean countries. Still, despite these territorial pockets of Spanish predominance, competence trends 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. Moreover, the city of Barcelona and the BMA more generally continue to be particularly interesting for examinations of language contact between two related languages, Spanish and Catalan, with widespread bilingualism and long-term contact. More specifically, this bilingualism resultant from extensive contact between native (Catalonian) bilingual speakers of Catalan and Spanish and Spanish-speaking immigrants adds an additional layer of complexity to the understanding of language contact in the social ecology of the region.

Notably, it has been claimed (see for example Vila-Pujol 2007: 67, 75) 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 inasmuch as the lack

of official status throughout the country as a whole, it nonetheless has a very high degree of use and perceived power (or prestigious status) throughout Catalonia, giving it effectively more administrative power than Spanish, a state language.²⁹

1.3.3. Social And Attitudinal Consequences of Catalan-Spanish Contact in Catalonia

In light of the aforementioned 21st century immigration waves to Catalonia, and in particular the BMA and the city of Barcelona, it is important to consider whether or not non-Catalonian immigrants, particularly those for whom Spanish is already a native language (i.e., the majority), are interested in learning and using Catalan. Recall from section 1.3.1 that from the 18th century (and the signed of the Ordinance of New Plant) until the end of the Franco dictatorship in 1975 (excluding the two brief periods of autonomous Catalan governance in the early 20th century), native and habitual (or dominant) speakers of Catalan were overwhelmingly native Catalonians. Simply put, Spanish and foreign immigrants to Catalonia, until 1975, did not typically learn Catalan. As discussed in section 1.3.2 and shown previously in table 1, though the asymmetric bilingualism between Catalan and Spanish is gradually becoming less prominent over time, presently over 99% of speakers living in the city of Barcelona (as well as over 99% of speakers living in Catalonia) learn to speak Spanish or speak it natively, whereas only 80.4% of speakers living in the city of Barcelona (as well as 80.4% of speakers living in Catalonia) have learned to speak Catalan (Institut d'Estadística de Catalunya 2014). The persistence of this asymmetry can be linked to speakers' attitudes toward learning and using Catalan, which strongly varies according to immigrant status. For both the city of Barcelona and Catalonia as a whole, 2013 census data curiously reveal that foreign immigrants are the most interested in learning and/or improving their Catalan,

²⁹ The prestige and linguistic capital afforded to Catalan in Catalonia suggests that foreign immigrants that undergo linguistic assimilation (insomuch as their decision to acquire competence in Catalan) do so as motivated by the desire to hold better jobs, rather than exclusively as motivated by solidarity. Further information regarding these trends is offered in table 4 in section 1.3.3.

whereas non-native Catalan speakers born in Catalonia, followed by Spanish immigrants, are increasingly less interested in learning and/or improving their Catalan (Institut d'Estadística de Catalunya 2014). A comparison of interest ratings in learning and/or improving one's Catalan for Catalonia and the city of Barcelona are presented below in table 4.

Table 4: 2013 Population (%) Ages 15+ Interested in Learning/Improving Catalan by Nationality

	Barcelona (city)	Catalonia
Native Catalanian	36.9	36.8
Spanish Immigrant	27.5	29.6
Foreign Immigrant	64.4	65.7
TOTAL	41.2	40.6

Source: Institut d'Estadística de Catalunya 2014

Despite the predominance of Spanish in the city of Barcelona as compared to Catalonia as a whole, the figures above in table 4 show that regardless of Catalonian territory, foreign immigrants constitute the majority of speakers interested in acquiring Catalan. Nevertheless, differences between Barcelona (city) and Catalonia emerge when it comes to the language or languages that speakers claim they would like to use habitually in the future. In particular, Spanish and foreign immigrants in Barcelona do not show any preference for using more Catalan than Spanish, whereas some preference for Catalan use over Spanish is observable in Catalonia as a whole (Institut d'Estadística de Catalunya 2014). These 2013 census data, which additionally show that speakers across all of Catalonia most desire to use both Catalan and Spanish equally in the future, are presented below in table 5.

Table 5: 2013 Population (%) Ages 15+ Desiring to Speak Catalan/Spanish Habitually in the Future

	Nationality	Only Catalan	Catalan > Spanish	Equally Catalan / Spanish	Spanish > Catalan	Only Spanish
Barcelona (city)	Native Resident	21.5	25	35.9	3.7	3.8
	Spanish Immigrant	0	0	41.9	13.2	24.8
	Foreign Immigrant	0	0	48.3	0	12.9

Table 5 (cont.)

	TOTAL	14.5	16.6	39.8	6.6	9.8
Catalonia	Native Resident	26.5	22.7	33.1	3.5	3.9
	Spanish Immigrant	4.1	7	40.9	9.9	28.8
	Foreign Immigrant	6.2	7.2	43.4	6.2	12.7
	TOTAL	17.7	16.3	36.7	5.5	11.1

Source: Institut d'Estadística de Catalunya 2014

Synthesizing the trends observable in tables 1, 2, 4, and 5, whereas competence and interest in learning or improving Catalan does not vary considerably between Barcelona and Catalonia as a whole, habitual language use and future language use preferences do vary across the territories, with Catalan-only use being somewhat more disfavored in Barcelona. Moreover, speakers in Barcelona and Catalonia, regardless of immigrant status, most positively esteem using both Catalan and Spanish equally in the future.

This preference for an active level of bilingualism between Catalan and Spanish holds consequences for ties with identity and ethnicity,³⁰ insomuch as for the greater portion of Catalonia's existence, specifically up until 1975, the ability to speak Catalan was associated with native Catalonian citizenship (Arnal 2011: 14-15; Rafanell 2000: 199, as cited in Arnal 2011: 8). As Woolard & Gahng (1990: 314) describe, “[w]hereas almost all Catalan speakers are bilingual in Castilian, the majority of Castilian speakers in Catalonia at the time of autonomy were monolingual or only passively bilingual.” Accordingly, shortly after the reinstatement of the Generalitat in the early 1980s when the acquisition of Catalan by non-native speakers was still in its incipient stages, Woolard (1989: 38-39, as cited in Vann 2007: 254-255) argues that the creation and expression of Catalan or Spanish identity was principally mediated (i.e., alongside birthplace, descent, and sentiment) by language use: “As a Catalan is one whose native and habitual language is Catalan, so a Castilian is a person

³⁰ As the teasing apart of identity and ethnicity is not a main focus of this investigation, we adopt the following definition of ethnicity throughout the rest of this dissertation: “an individual's sense of belonging to a distinctive group whose members share a common history and culture” (Milroy 1987b: 103, as cited in Vann 2007: 255).

whose native and habitual language is Castilian.” Attitudes toward language use (and language varieties) in the early 1980s were found to reflect this stark boundary between Spanish and Catalan identities, and, crucially, have been found to change gradually over time (from 1980 to 2007) as a reflection of increasing Catalan-Spanish bilingualism. More specifically, the results from a matched guise experiment conducted in Barcelona (city) in 1980 (cf. Woolard 1984; 1989), and then repeated in 1987 (cf. Woolard & Gahng 1990) and again in 2007 (cf. Woolard 2009; 2011), reveal dramatic changes in how youth speakers of Catalan and Spanish backgrounds judge Catalan or Spanish language usage.³¹ Following Newman et al. (2008), we summarize these findings below.

With respect to solidarity attributes including “likeable,” “amusing,” “has a sense of humor,” “open,” “attractive,” and “generous,” in 1980 “...listeners rewarded linguistically identifiable co-members of their ethnolinguistic group for using their own language, and penalized them with significantly lower solidarity ratings when they used the out-group language” (Woolard 2009: 133). In other words, as all listeners could detect which guises were Spanish-dominant and which were Catalan-dominant (presumably based on salient auditory cues in Catalan-accented Spanish and Spanish-accented Catalan), Spanish-dominant listeners preferred the Spanish-dominant guises speaking in Spanish over Catalan, whereas Catalan-dominant listeners preferred Catalan-dominant guises speaking in Catalan over Spanish. This result can be understood as a preference for hearing unaccented or native-like Spanish or Catalan over L2- (accented) Spanish or Catalan. While neither listener group showed considerable differences in ratings between the languages of out-group guises (i.e., Catalan-listeners were unaffected by which language they heard Spanish-dominant guises use, and Spanish-dominant listeners were unaffected by which language they heard Catalan-

³¹ In all three matched guise experiments, four young female Barcelonan bilinguals, two dominant in Catalan and two dominant in Spanish, read an academic text (about mathematics) once in Spanish and once in Catalan. These recorded passages were then played to sets of Barcelonan high school students (from over 100 to over 200 students, depending on the year, with some overlap in schools across the studies), who filled out a questionnaire judging the speaker on various personal traits and characteristics.

dominant speakers use), it was additionally noted that Spanish-dominant listeners particularly disapproved of Spanish-dominant guises speaking in Catalan, interpreted as a kind of ethnolinguistic group betrayal (Newman et al. 2008: 309; Woolard & Gahng 1990: 315).³²

By 1987, however, although the preference for unaccented speech was still found for both listener groups, two noticeable differences in solidarity trends were found. First and foremost, Spanish-dominant listeners no longer severely penalized Spanish-dominant guises for speaking in Catalan. Second, Catalan-dominant listeners were no longer indifferent to the language production by Spanish-dominant guises, and awarded higher solidarity ratings for the (L2) Catalan usage. These changes were interpreted as the beginning of a breakdown of the ethnolinguistic boundary that had previously discouraged Catalan usage by Spanish-dominant speakers as reflected in the poor solidarity ratings by Spanish-dominant listeners and the ambivalent ratings by Catalan-dominant listeners (Woolard 2009: 133; Woolard & Gahng 1990: 315). In other words, by 1987, the use of Catalan by Spanish-dominant speakers was no longer ostracized by Spanish-dominant listeners, and was in fact favorably perceived by Catalan-dominant listeners, suggesting that the adoption of Catalan in habitual use by Spanish-dominant speakers was at last perceived positively in the (youth) community.³³

Most recently, in 2007, solidarity scores between the two languages were not distinct for any of the listener groups. In other words, the use of Catalan or Spanish no longer affected how listeners assigned solidarity attributes for each guise, suggesting that listeners no longer preferred guises to use one language instead of the other. This lack of a language

³² Intriguingly, Newman et al. (2008: 309) argue that this ‘linguistic betrayal’ was only available for Spanish-dominant listeners as a reflection of the asymmetric bilingualism in society. Since most Spanish-speakers were monolingual, their use of Catalan implied a shift from monolingualism to bilingualism. The same could not be said for Catalan-speakers, who were already bilingual in Catalan and Spanish. Moreover, this is argued to reflect the greater norm that Catalan-dominant speakers are expected to accommodate to Spanish in the presence of Spanish speakers, but not vice versa (Bastardas 1986; Boix i Fuster 1993; Woolard 1989, as cited in Newman et al. 2008: 330; Woolard & Gahng 1990: 315).

³³ Shortly thereafter, Sanz i Alcalà (1991: 125, 134-135) obtained corroborating results for a similar matched guise study on Spanish with Barcelonan youth (ages 17-18) speakers, in that nearly half of listeners (49%) couldn’t tell the difference between the Catalan-dominant and Spanish-dominant guises in Spanish, although Catalan-dominant listeners awarded higher solidarity scores to the Catalan-dominant guises.

effect on solidarity judgments aligns quite well with the aforementioned 2013 census data (in table 5) that showed a majority preference for the future use of both languages equally in Barcelona (city) and Catalonia. The lack of a preference (or perhaps more importantly, the lack of a penalty) for a speaker to use Catalan or Spanish represents the final stage in the loosening of the link between language and ethnolinguistic identity, as the use of Spanish or Catalan is no longer viewed as a fixed or nonflexible component of one's ethnolinguistic identity.³⁴ The results across all three studies are summarized succinctly by Woolard (2009: 147):

“Language affiliations are viewed by these young people even more than those in past years as the exercise of options, as stylistic choices that individuals can and do make, rather than as enduring essential characteristics. Many of these students and their families have moved toward increasing use of Catalan over the years and generations. At the same time, there are several signs that there is less peer-sanctioned social motivation among bilingual students than before to choose one language over the other in interaction. Overall, these findings show that there is increased bilingualism, a broadened acceptance of the Catalan language, and an accompanying expansion of Catalan identity among these young people compared to their counterparts of twenty years ago.”

As previously mentioned in section 1.3.2, since more than 600,000 L1-Spanish speakers currently use Catalan as their habitual language in Catalonia (Institut d'Estadística de Catalunya 2014), substantiating Arnal's (2011: 15) claim that “...Catalan ha[s] ceased to be a language reserved exclusively for internal use by the group of native Catalan speakers, and ha[s] been adopted for habitual use at work or with friends by some speakers whose first language [i]s Spanish,” then it follows that the absence of disdain for L2- (accented) speech found in Woolard's 2007 study can be interpreted as another indicator of the acceptance of

³⁴ Analyzing properties of deictic elements in Catalan-Spanish discourse, Vann (2007: 264) comes to a parallel conclusion: “The division in Catalan versus Spanish identities and ideologies is not based on habitual choice of language.”

active bilingualism in Barcelona. In fact, using a similar matched guise methodology in 2006, Newman et al. (2008) found that non-native (and male) guises (i.e., Spanish-dominant speakers using Catalan and Catalan-dominant speakers using Spanish) were rated higher in solidarity attributes than native (and male) guises. Newman et al. (2008), Trenchs-Parera & Newman (2009), and Newman (2011) describe this preference as *linguistic cosmopolitanism*, linking it to a modern ideology supportive of bilingualism and language transfer: “Linguistic Cosmopolitans support multilingualism as a marker of acceptance of the ethnolinguistically heterogeneous society that they value. For people holding this ideology, the in-group/out-group dynamic breaks down because they do not see group membership as a proper motive for assessing social attractiveness” (Newman 2011: 41). Accordingly, the acceptance of (and even the preference for) active bilingualism by both native speakers of Catalan and native speakers of Spanish, as indicated by solidarity scores in matched guise experiments and census data on future and habitual language preferences, underpins one of the more modern and currently prevalent linguistic ideologies in Barcelona and Catalonia more generally. In this dissertation, we advance these prior attitudinal studies by offering an innovative approach to the matched guise methodology in which rather than compare attitudes on Spanish and Catalan, we investigate the attitudes linked to specific linguistic features in Catalanian Spanish.

1.3.4. Contact Effects in Catalonia

The asymmetric bilingualism of Catalan and Spanish in Catalonia (favoring Spanish) is interestingly reflected in linguistic effects of language contact, in that the influence of Spanish on Catalan has been argued to be greater and more pronounced (or intense) than Catalan on Spanish (cf. Arnal 2011; Galindo Solé 2003), leading additionally to a greater amount of linguistic research focusing on the evolution of Catalan (rather than Spanish) in

Catalonia (Galindo Solé 2003: 18). Regarding the effects of Spanish on Catalan, Arnal (2011) proposes a historical division between relatively more subtle and earlier contact effects, namely non-basic lexicon borrowings, and more structurally profound and recent contact effects in the domains of syntax and phonology. Arnal (2011) argues that up until the arrival of massive waves of Spanish-speaking immigrants to Catalonia in the mid-20th century, lexical borrowing was the primary (if not sole) contact innovation observable in Catalan, resultant from a relatively small population of native Catalan speakers that acquired Spanish as a second language borrowing select Spanish words into Catalan, constituting RL agentivity. In contrast, since the arrival of the present majority of L1-Spanish speakers to Catalonia, this large population of Spanish speakers has acquired Catalan as a second language and imposed into it Spanish features of greater stability, such as syntax and phonology, constituting SL agentivity. This dramatic shift in agentivity, reflective of the corresponding shift in population demographics, is summarized thusly:

“In contrast to the changes of centuries past, the changes now taking place in the Catalan spoken in Catalonia as a result of contact with Spanish are due to the fact that Spanish - that is, the source language - is now the agent language in the contact between Spanish and Catalan, whereas this role was previously played by Catalan. Since SL agentivity affects the more stable components or subcomponents of the recipient language, people whose first language is Spanish and speak Catalan as a second language unconsciously use syntactical constructions and sounds that are not used by speakers whose first language is Catalan. These new bilingual speakers introduce changes in Catalan by preserving the phonetics and syntax of Spanish, which is their linguistically dominant source language. As a result, Spanish grammatical material and, to an even larger extent, phonology are transferred upon the Catalan spoken by these bilinguals” (Arnal 2011: 18).

While the presence of Spanish contact innovations in Catalan (which as Arnal [2011]

suggests now span a wider gambit of grammatical domains)³⁵ is not a point of any substantial degree of contention, what is of considerably greater contention is the claim that the Spanish of Catalonia does not similarly show (or no longer shows) Catalan contact innovations, expressed in the following excerpts:

- “It should be taken into account that, in the current situation of generalized bilingualism in Catalonia, the change caused by contact does not affect Spanish, but rather only affects Catalan, which is a language that no longer has any monolingual speakers” (Arnal 2011: 22);
- “*El vell complex del ‘deix català’ (el acento) quan es parlava en castellà ja no existeix; ha deixat pas a la situació contrària: ara és el català que es parla amb accent castellà, i això no suscita la més mínima reprovació social* [The old complex of the ‘Catalan way of speaking’ (accent) when one spoke in Spanish doesn’t exist anymore; it has laid the grounds for the opposite situation: now it’s Catalan that’s spoken with a Spanish accent, and this doesn’t provoke the most minimal social reproach] (Prats, Rafanell, & Rossich 1990: 37);
- “In contrast to what has occurred up to now, there are more and more speakers in Catalonia who express themselves better in Spanish than in Catalan. One of the most notable changes is the fact that the typical phonetic characteristics heard in Catalans speaking Spanish have disappeared in the youngest generations...” (Arnal 2011: 16).”

The claims expressed above fit as sub-arguments to a broader (and arguably even more controversial) claim that Catalan is becoming a mere dialect of Spanish, losing all idiosyncrasies that make it a different language (Arnal 2011: 22; Prats et al. 1990: 36).

Though it is beyond the scope of this dissertation to address (or more precisely, to refute) this broader claim, the claims of an apparent lack of contact innovations in the Spanish of Catalonia will be directly refuted inasmuch as two phonetic phenomena are concerned, namely lateral velarization and intervocalic alveolar fricative voicing. Moreover, though

³⁵ The effects of several other (immigrant) languages beyond Spanish on Catalan, including Chinese, Tagalog, Arabic, Mandingo, Berber, Wolof, Soninke, Punjabi, Fula, Ukrainian, and Romanian, have recently been explored by Gràcia (2014). Moreover, one may reference a brief set of Catalan innovations (spanning multiple grammatical domains) ascribed to contact from Spanish in Boix i Fuster & Vila i Moreno (1998: 229-230).

additional evidence for phonetic contact innovations (beyond just lateral velarization and intervocalic alveolar fricative voicing) in the Spanish of Catalan-speakers is reported in Badia i Margarit (1964), Báez de Aguilar (2008), Casanovas Català (1995), Moll (1961), Seib (2001), Serrano Vázquez (1996a), Sinner (2002), Vann (2000; 2001; 2007), and Wesch (1997), it should be noted that contact with Catalan has indeed resulted in Spanish innovations that, akin to Spanish features found in Catalan, span a wide gambit of grammatical domains, including syntax and morphology (cf. Blas Arroyo 1993; 1996; 2011; Casanova 1996; Mas i Miralles 1993; Seib 2001; Sinner 2002; 2003; 2004; 2008; Wesch 1997; 2004; Vann 2000; 2001), as well as the lexicon, semantics, and pragmatics (cf. Argenté & Payrató 1991; Badia i Margarit 1964; Blas Arroyo 2011; Casanovas Català 2000; Cerdá 1984; Español 1996; Mas i Miralles 1993; Montoya 1992; Seib 2001; Serrano Vázquez 1996b; Sinner 2004; Vann 1998; 2000; 2001; 2007; Vila 1996; Vila-Pujol 2007; Wesch 1992; 1997). Moreover, in light of the aforementioned ethnolinguistic breakdown between (habitual) language use and identity (cf. Woolard 2009), the presence of Catalan features in the Spanish of Catalonia is in fact not at all surprising, being a means for Catalonians to index Catalan identity when speaking in Spanish, as several researchers have previously suggested:

- “...even when Catalan people do not speak Catalan, they can still communicate their ethnicity or sociocultural identity through the linguistic resources available to them in Spanish. [...] ...Catalans can use, and recognize the use of, the linguistic resources available to them in their variety of Spanish as another ethnolinguistic and ideological assertion besides language choice...” (Vann 2007: 253, 271);
- “...cuanto más catalán se siente [el hablante], más concienciado está del uso de la lengua como símbolo principal de las diferentes culturas y como una parte importante de su propia identidad [...the more Catalan [the speaker] feels, the more aware s/he is of the use of language as a primary symbol of the different cultures and as an important part of his/her own identity]” (Seib 2001: 120);

- “In the case of the bilingual Catalan society, any person can simultaneously belong to various groups, that is, have multiple identities based on language preferences (and/or prejudices against them). Language performance can help in the construction of such an identity, but seeing as Catalan society is bilingual, we have to look for symbolic uses of the language which ‘serve an emblematic function: they identify the speaker as belonging to a particular group, or having a particular social identity’ [Guy 1988: 37]” (Sinner 2002: 162).

In summary, rather than presume that the massive influx of non-Catalonian Spanish speakers to Catalonia in the mid-20th century has caused a unidirectional influence of Spanish on Catalan, this dissertation seeks to show that Catalan-Spanish transfer is in fact bi-directional, with Catalan acting as the source language for contact innovations in Spanish.

1.4. Outline of the Dissertation

The focus of this dissertation is the influence of Catalan on the Spanish of Catalonia from a speaker-based theory of language change. By examining speakers’ usage patterns of two specific linguistic features in this contact variety, we offer an empirical means of assessing contact-induced change that additionally reveals insight into the processes of innovation and diffusion in settings of long-term language contact. Moreover, an analysis of the perceptions and attitudes towards each of these linguistic features enables a greater understanding of how their trajectories are shaped by social factors, and builds upon prior attitudinal research by highlighting direct links between production patterns of specific features and attitudes towards those specific features (rather than towards a language variety as a whole). In short, the main goal of the sociophonetic and attitudinal experiments conducted for this dissertation is to uncover the trajectory of the phonetic influence of Catalan on the Spanish (CCS) of Catalan-Spanish bilinguals in Barcelona, and the linguistic and social factors involved. The study of the usages of CCS [ɫ] and [z] in Barcelona serves as a case study for exploring language variation and change in a special bilingual contact setting as described in this first

chapter.

Chapter 2 of this dissertation consists of a review of literature for prior research concerning both lateral velarization and intervocalic alveolar fricative voicing in monolingual and contact varieties of Spanish. Specific findings regarding the occurrences of Spanish [ʎ] and intervocalic [z] are reported so as to permit a comparison of their usage with that in the present CCS data, enabling a deeper analysis of whether or not Catalan in fact is acting as the source language for these variants, and whether or not they in fact are contact innovations in CCS. Prior research on these variants in CCS and other Spanish varieties is additionally detailed in order to justify the experimental methodology employed in this dissertation.

Chapter 3 details the sociolinguistic methodology behind a set of CCS and Catalan speech elicitation tasks, a matched guise experiment, and debriefing interview. All experimental tasks are detailed with respect to their design and implementation with the speech community in question. Information about and justification for the choice of speakers recruited to participate in the aforementioned tasks is also given, along with details regarding how participants were contacted and tested. Moreover, justification is provided for the choice of measure techniques used for linguistic analysis of the collected data.

Chapters 4 and 5 present the results for all of the experimental tasks according to each linguistic variable in question: chapter 4 discusses results for lateral velarization, whereas results for intervocalic alveolar fricative voicing are presented in chapter 5.

Chapter 6 concludes this dissertation with an in-depth discussion of the results presented in chapter 4 juxtaposed with those of chapter 5, summarizing the main findings and discussing their implications for our understanding of language contact and language variation and change. In particular, attention is devoted to how this dissertation's findings illuminate our understanding of the evolution of the Spanish of Catalonia in relation to other contact varieties of Spanish, as well as monolingual varieties of Spanish.

CHAPTER 2: LATERAL VELARIZATION AND INTERVOCALIC ALVEOLAR FRICATIVE VOICING

Though this chapter presents an in-depth background on both Spanish laterals and (intervocalic) fricatives, we begin in the following subsections with an overview of Spanish laterals, detailing articulatory mechanisms posited to mediate lateral velarization. Additionally, we discuss two possible accounts for the presence of lateral velarization in CCS. The first account ascribes this phenomenon in CCS to a language-external source, namely contact with Catalan. In contrast, the second account discusses this phenomenon as motivated by language-internal mechanisms in the context of any Spanish variety (as opposed to strictly those in contact with Catalan or other languages). Moreover, we present an overview of prior CCS research concerning lateral velarization in order to best characterize the present status of [ɫ] in Barcelonan CCS.

2.1. Spanish Lateral Production and Lateral Velarization

2.1.1. Linguistic Characterizations of Spanish /l/

The only lateral phoneme shared by all Spanish varieties is the voiced alveolar /l/, which exhibits a degree of allophonic variation (via regressive assimilation of place of articulation to a following consonant) resulting in additional (i.e., beyond alveolar [l]) productions of dental [ɭ] (e.g. *alto* ‘tall’ [áɫto]), alveopalatal (or palatalized) [ɫʲ] (e.g. *colchón* ‘mattress’ [kol.ʲtʃón]), and, depending on the dialect, interdental [ɮ] (e.g. *alzar* ‘to raise’ [aɫ. θár]) and palatal [ʎ] (e.g. *el llavero* ‘the keychain’ [eʎ:a.βé.ro]) (Azevedo 1992: 75-76; Dalbor 1997: 248-250; Hualde 2014: 178-179; Martínez Celdrán & Fernández Planas 2007: 138-139; Morgan 2010: 331-332; Navarro Tomás 1918: 88-89; Schwegler, Kempff, & Ameal-Guerra

2010: 294-295; Whitley 2002: 47). The (monolingual) Spanish lateral /l/ is characterized as ‘clear’ or ‘light,’ that is, non-velarized, in all linguistic contexts, including preceding a velar consonant in words like *algo* ‘something’ [ál.ɣo] (Casanovas Català 1995: 56; Dalbor 1997: 251; Hualde 2014: 178; Hualde, Olarrea, Escobar, & Travis 2010: 79; Morgan 2010: 331; Payrató 1985: 108; Proctor 2009: 50; Quilis, Esgueva, Gutiérrez-Araus, & Cantarero 1979; Recasens & Espinosa 2005: 3; Schwegler et al. 2010: 297-299; Teschner 1996: 155).

Velarized or ‘dark’ productions of (monolingual) Spanish /l/ as [ɫ] are described as “*totalmente extraña a la lengua española* [totally strange to the Spanish language]” (Schwegler et al. 2010: 299), echoing the prescriptive call for their avoidance by Navarro Tomás (1918: 88): “...[*la lengua*] *se hace ligeramente cóncava; pero sin llegar en ningún caso a la articulación hueca o velar de la l inglesa o catalana, cuyo uso debe evitarse cuidadosamente en español* [...] [the tongue] is made slightly concave; but in no instance reaching the velar articulation of the English or Catalan l, whose use should be carefully avoided in Spanish].”

With respect to articulatory differences between light (or alveolar) [l] and dark (or velarized) [ɫ], Recasens (1996: 64) notes that there is considerable articulatory complexity involved, which we evidence in a brief set of different articulatory mechanisms claimed to distinguish [l] from [ɫ]:

- Tongue dorsum retraction: Whereas [l] shows no tongue dorsum retraction, [ɫ] necessarily exhibits tongue dorsum retraction (though not necessarily always toward the velum) (Johnson 2012: 198; Recasens 1996: 64; 2004: 594; Simonet 2010a: 664; Stevens 2000: 543; see also Browman & Goldstein 1995; Catford 1977; Straka 1968);
- Tongue body shape and alveolar contact with tongue tip: Whereas [l] shows a rigid tongue body and alveolar contact with the tongue tip, [ɫ] exhibits a bunched tongue body approaching the velum and slight or no alveolar contact with the tongue tip (Bean 2013: 2; Pieras 1999: 213);

- Tongue predorsum position and postdorsum retraction: Whereas [l] shows a fairly high (and front) tongue predorsum and no tongue postdorsum retraction, [ɫ] exhibits considerable tongue predorsum lowering and tongue postdorsum retraction (Allen 1989: 33; Bronstein 1960: 125; Recasens 2012: 368-369; 2014b: 176; Recasens, Fontdevila, & Pallarès 1995: 38; Recasens & Pallarès 2001: 37;);
- Tongue position and gestural speed: Whereas [l] shows a faster anterior tongue position, [ɫ] exhibits a slowly moving posterior tongue position (Giles & Moll 1975, as cited in Van Hofwegan 2009: 305);
- Sequential gestural ordering: Whereas [l] shows a consonantal apical gesture followed by a vocalic dorsal gesture, [ɫ] exhibits a vocalic dorsal gesture followed by a consonantal apical gesture (Sproat & Fujimura 1993, as cited in Van Hofwegan 2009: 305).

As summarized in Simonet (2008: 256-259), the articulatory mechanisms referenced above have been invoked to posit competing accounts for lateral velarization cross-linguistically. One account, supported by Browman & Goldstein (1995), Recasens & Farnetani (1994), and Sproat & Fujimura (1993), argues that the difference between light and dark laterals is categorical and arises from a differences in gestural specification: [l] has a single gestural specification, namely apical raising, whereas [ɫ] has two gestural specifications, namely apical raising and dorsal lowering. Another account, supported by Oliveira, Martins, Teixeira, Marques, & Sá-Couto (2011), Recasens (2004; 2012), Recasens & Espinosa (2005), Recasens et al. (1995; 1996), and Recasens, Pallarès, & Fontdevila (1998) argues that both lateral categories share a single apical gesture, but are distinguished gradiently along a continuum of predorsum lowering and postdorsum retraction. Moreover, additional considerations for a second gradient parameter, namely the frontedness of the apical-coronal constriction, have also been motivated (cf. Ladefoged & Maddieson 1996; Recasens & Espinosa 2005; Recasens & Pallarès 2001).

Whether or not clear and dark laterals are specified for the same number of articulatory gestures is a question that falls outside the scope of this dissertation, particularly

insomuch as the manifestations of velarization in the acoustic signal (i.e., how one can measure the degree of velarization for a particular /l/ production) are not posited to vary across articulatory accounts. Still, as the principal site of contention regarding articulatory mechanisms responsible for lateral velarization concerns whether or not the difference between [l] and [ɫ] is categorical or gradient, it is worth noting that the most recent empirical data for Spanish and Catalan laterals (cf. Recasens 1996; 2004; 2012; 2014b; Recasens & Espinosa 2005; Recasens et al. 1995; Simonet 2010a; Simonet 2010b) suggests that lateral velarization indeed is a gradient phenomenon that occurs along a continuum of scalar darkness. Still, although we shall proceed to treat lateral velarization in the present CCS data as a gradient phenomenon, it is important to consider that discussions of lateral velarization often expound differences in degrees of darkness across language varieties as a binary distinction between varieties that do or do not feature dark /l/s, albeit recognizing that one variety's clear or dark /l/s may be more clear or more dark than another's. For example, Spanish, Italian, French, and German have been described as languages lacking a dark /l/ (and, for example, Spanish light /l/s are lighter than German light /l/s), while Catalan and English are described as featuring dark /l/s (Prieto 2004: 204; Recasens 2004: 594; 2012: 371 [and sources within]; Recasens et al. 1995: 38; Turton 2014: 189; Van Hofwegen 2009: 306).³⁶ Individual dialects even show variation in the grade of darkness exhibited, particularly as related to syllable position: whereas Central Catalan is claimed to exhibit a moderately dark [ɫ] that is nonetheless darker syllable-finally than syllable-initially, Majorcan Catalan is claimed to display a comparatively darker [ɫ] across all syllable positions (Recasens 2014a: 20). Accordingly, the use of the terms light [l] and dark [ɫ] throughout this dissertation reflects a convenience to discuss (considerably) less and (considerably) more

³⁶ Moreover, one can encounter terms like “canonical light /l/” in the lateral production literature (cf. Hayes 2000; Sproat & Fujimura 1993; Van Hofwegen 2009), evidencing the fact that despite an understanding of /l/ velarization as a scalar phenomenon, it is still useful to maintain some sense of discrete categories regarding lightness and darkness.

velarized /l/ productions respectively, without suggesting the presence of a categorical boundary between the two (particularly inasmuch as we are unaware of any language that phonemically contrasts light [l] and dark [ɫ]).

2.1.2. Catalan (and Other Languages) as a Source for Spanish Lateral Velarization

In contrast to (monolingual) Spanish, the Central Catalan alveolar voiced lateral /l/ is characterized as exclusively velarized, realized as dark [ɫ] in all linguistic contexts, with an especially high degree of velarization in coda position, following a posterior vowel, and/or before a pause, labial consonant, or velar consonant (Badia i Margarit 1984: 103-104; Casanovas Català 1995: 56; Hualde 1992: 373, 396; Payrató 1985: 108; Prieto 2004: 204; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2004: 594; 2012: 371; 2014a: 20; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37, 47-48; Recasens et al. 1995: 38; Wheeler 2005: 34). Thus, as the alveolar lateral /l/ in Spanish and Catalan is respectively realized as [l] and [ɫ], this sets up a relatively straightforward opportunity for bi-directional contact influence (i.e., L1-transfer), in which Catalan-Spanish bilinguals dominant in Catalan or Spanish may respectively transfer the Catalan [ɫ] into Spanish or the Spanish [l] into Catalan. Reports of both cases of contact influence are abundant (cf. Arnal 2011: 18; Báez de Aguilar 2008; Casanovas Català 1995: 56; Davidson 2012a; 2014a; Hualde 2014: 178; Payrató 1985: 108; Pieras 1999; Serrano Vázquez 1996a: 378; Simonet 2008; 2010b; Sinner 2002: 163; Wesch 1997: 298; Vann 2000: 123; 2001: 124), likely a reflection of the relatively salient status of Catalan and Spanish laterals in the bilingual Catalan-Spanish context. For example, Hickey (2012: 5) cites the dark [ɫ]s of Catalan (and Catalan speakers) as a prototypical salient feature in order to define the concept of linguistic salience. Moreover, Bibiloni's (2000) *Guia de correcció fonètica* [Guide to Phonetic Correction], an online tutorial to help Spanish speakers speak Catalan with a more native accent, contains as the

very first lesson instructions for Spanish speakers to stop using light [l] in Catalan, helping them successfully “*fugir de la el·l espanyola* [flee from the Spanish /l/].” Though more detailed information on CCS [ɫ] production is offered in 2.1.4, the imposition of Spanish and Catalan laterals is considered a hallmark of language contact in the bilingual Catalan-Spanish community (cf. Arnal 2011; Casanovas Català 1995; Payrató 1985; Moll 1961; Prats et al. 1990; Sinner 2002), and accordingly constitutes a strong case for contact-induced innovation (additionally recall from section 1.2.2 that contact innovations are in fact expected in the Catalan-Spanish bilingual setting).

The only systematic attestation of Spanish [ɫ] outside of the Catalan-Spanish bilingual context that we are aware of is found for English-Spanish bilinguals, namely English speakers learning Spanish as a second language in the United States. As American English exhibits [ɫ]³⁷ (Bronstein 1960: 124-125; Browman & Goldstein 1995; Johnson 2012; Olive, Greenwood, & Coleman 1993: 204-205; Slomanson & Newman 2004; Sproat & Fujimura 1993, Turton 2014; among many others), another relatively straightforward opportunity for bi-directional contact influence is available. English-Spanish bilinguals dominant in English or Spanish may respectively transfer the English [ɫ] into Spanish or the Spanish [l] into English. Though the evidence for the transfer of Spanish [l] into English is not as abundant as that available in the Catalan-Spanish context, New York City Latino English (cf. Slomanson & Newman 2004) and Southern Texas Chicano English (cf. Van Hofwegen 2009) have been shown to exhibit just such a phonetic contact innovation. Moreover, with respect to the transfer of English [ɫ] into Spanish, Díaz-Campos (2004; 2006), Bean (2013), and most recently Solon (2015) find that Spanish /l/ is produced as [ɫ] quite commonly by English-speaking late-learners of Spanish. This particular imposition is described as “extremely noticeable and foreign-sounding” (Dalbor 1997: 251; see also Whitley 2002: 59) and appears

³⁷ Though all American English dialects are claimed to exhibit [ɫ] syllable-finally, a majority additionally exhibit [l] syllable-initially (Slomanson & Newman 2004: 209; see also Whitley 2002: 59).

in explicit instruction in several Spanish phonetics textbooks for U.S. students (e.g. Dalbor 1997; Hualde 2005; 2014; Hualde et al. 2010; Morgan 2010; Schwegler et al. 2010). An entire section of Teschner (1997) is even devoted to this L2-speech feature, entitled “*El fonema /l/ no tiene alófonos velares como en inglés* [The Phoneme /l/ Does Not Have Velar Allophones Like in English].”

In summary, that a parallel situation of lateral phonetic contact influence exists for Spanish-English bilinguals offers an additional indication that the equivalent contact influence is certainly not out of the question (phonetically speaking) in the context of Catalan-Spanish bilinguals.

2.1.3. CCS Lateral Velarization as a Language-Internal Phenomenon

As discussed in section 2.1.2, velarized laterals are characterized as strictly absent in monolingual varieties of Spanish, and the only contact varieties of Spanish that exhibit [ɫ] are in contact with English and Catalan, both of which feature [ɫ]. Still, the exclusive presence of [ɫ] in Spanish varieties in contact with languages with a parallel [ɫ] does not definitively exclude the possibility that Spanish [ɫ] may have arisen endogenously, or completely independent of language contact, in these varieties. To this end, it should be considered that allophonic variation between [l] and [ɫ] is claimed to have existed in Latin in a complementary distribution favoring [l] syllable-initially and [ɫ] syllable-finally, directly paralleling the same distribution of /l/ allophones that developed in Germanic languages such as English and Dutch (cf. Allen 1989: 33; Grandgent 1991: 185-187; Niedermann 1953: 9; Pope 1973: 74-76, Rasico 1981: 200; Recasens 2014a: 21; Slomanson & Newman 2004: 209).

The premise behind this claim, beyond Pliny the Elder’s contrastive description of Latin syllable-initial /l/ as ‘*exilis* [thin]’ and syllable-final /l/ as ‘*pinguis* [fat]’ or ‘*plenus* [full]’ (Allen 1989: 33; Rasico 1981: 200), is the observation that front vowels such as [e],

adjacent to syllable-final /l/ in words like *ueltis* [you all wish] and *uelo* [I wish], underwent backing to [o] to yield *uoltis* (eventually *uultis*) and *uolo*, in contrast to unchanged [e] in *uelim* [that I wish], adjacent to a syllable-initial /l/ (Allen 1989: 33). Accordingly, Badia i Margarit (1984: 199; see also Pieras 1999: 242) and Recasens (1996; 2014a: 20-21) suggest that syllable-final [ɫ] was once present in all Romance languages, directly inherited from Latin. Its existence in Old Spanish and Old French, for example, is evidenced by the sound change [aɫC] > [awC] > [oC]: Latin *ALTARIU* ‘mound’ > Old Spanish **autero* > Spanish *otero*; Latin *ALTU* ‘tall’ > Old French *haut* [aw] > French *haut* [o] (Boyd-Bowman 1980: 81-82; Pieras 1999: 242; Pope 1973: 81, 83; Recasens 2014a: 21). More generally, the vocalization and/or elision of (syllable-final) [ɫ], argued in Recasens (1996) to be a product of coarticulation mechanisms, is observable in the development of several Romance varieties, just a few of which we list below for illustrative purposes:

- Provençal: *CALIDU* ‘hot’ > *caut*; *FALSU* ‘false’ > *faus* (Recasens 1996: 66);
- Old Catalan: *ALTERU* ‘another one’ > *autre*; *MOLTONE* ‘mutton’ > *moutó* (Recasens 1996: 66);
- Italian (Sicilian, Puglia, Abruzzi, Piedmont, Ligurian): *SALTU* ‘jump’ > *sautu* (Recasens 1996: 66);
- Old Portuguese: *PALPARE* ‘to touch’ > *poupar*; *FALCE* ‘sickle’ > *fouce* (Recasens 1996: 66);
- Sutselvan Rhaetoromance: *ALTU* ‘tall’ > *ault*; *CALIDU* ‘hot’ > *cault* (Recasens 1996: 67);
- Spanish: *INSULSU* ‘tasteless’ > *soso*; *SULPHURE* ‘sulfur’ > *azufre* (Recasens 1996: 84);
- Gascon: *DUCLE* ‘sweet’ > *dos*; *PULICE* ‘flea’ > *pude* (Recasens 1996: 84);
- Catalan: *POLYPU* ‘octopus’ > *pop*; *PAULU* ‘Paul’ > *Pau* (Badia i Margarit 1984: 241; Recasens 1996: 84);
- Portuguese: *MULTU* ‘much’ > *multo*; *TALPA* ‘mole’ > *toupeira* (Boyd-Bowman 1980: 81);
- French: *ALTERU* ‘another one’ > *autre*; *FALCE* ‘sickle’ > *faux* (Boyd-Bowman 1980: 81).

Synthesizing, though Romance languages such as (monolingual) Spanish, French, and Italian presently exhibit only [l], whereas Catalan and Portuguese presently show only [ɫ], historically, they all showed allophony between [l] and [ɫ], respectively from Latin syllable-initial /l/ and syllable-final /l/. In Catalan and Portuguese, it can be inferred that the [ɫ] allophone eventually extended from syllable-final to syllable-initial position, resulting in [ɫ] presently found in words like ‘liquid’ (Latin *LIQUIDUS* > Cat. *liquid* / Port. *líquido*) as well as ‘bald’ (Latin *CALVUS* > Cat. *calb* / Port. *calvo*). In contrast, in Spanish, French, and Italian, it can be inferred that the light allophone eventually extended from syllable-initial to syllable-final position, resulting in [l] presently found in words like ‘sage’ (Latin *SALVIA* > Sp. *salvia* / Ital. *salvia*) or ‘animal’ (Latin *ANIMAL* > Sp. *animal* / Fr. *animal*), as well as ‘wool’ (Latin *LANA* > Sp. *lana* / Fr. *laine* / Ital. *lana*).

In order to suggest that CCS [ɫ] has arisen endogenously, it must be assumed that the monolingual Spanish of Catalonia (spoken by immigrants from monolingual areas of Spain), which would date to no earlier than the 18th century³⁸ and which would have exhibited exclusively light [l]s, has reselected dark [ɫ] as a competitive variant of /l/.³⁹ Considering the allophonic distribution of [l] and [ɫ] in Latin and in Germanic languages, particularly as supported by cross-linguistic evidence of stronger lateral velarization being favored in syllable-final positions (cf. Browman & Goldstein 1995; Recasens 2012; Recasens & Espinosa 1995; Van Hofwegen 2009), it would be most probable that if monolingual Spanish speakers in Catalonia innovated [ɫ], it would have first appeared syllable-finally, and accordingly be accounted for by articulatory mechanisms independent of contact with Catalan (i.e., that Spanish [l] has a known propensity for darkening in syllable-final position).

Support for such a development in Romance (i.e., [l] becoming [ɫ] syllable-finally)

³⁸ Refer back to section 1.3.1 for information on the social conditions and events that first promoted monolingual Spanish in Catalan-speaking territories.

³⁹ Echoing sections 1.1 and 1.1.1, the phrasing used here is not to suggest that languages select variants; rather, speakers are the agents of change, and speakers are the ones that first innovate a variant.

exists in French, albeit as an intermediate step in the development of the consonantal system dated roughly between the 6th and mid-12th centuries (Pope 1973: 76-77, 83). Since Latin /l/ was realized as [ɫ] only syllable-finally, the alveolar lateral geminate /l:/ in words like *CASTELLU* ‘castle’ and *CABALLOS* ‘horses’ was realized as [l]. Reconstructing from modern French *château* and *chevaux*, we may propose Old French **châtell* and **chevalls*, which following degemination would yield **châtel* and **chevals*, both with [l]. Both light [l]s, now in a syllable-final position particularly subject to darkening, would then yield **châtel* and **chevals* with syllable-final [ɫ] during a brief period of time, accounting for their subsequent vocalization to [o] (cf. Pope 1973; Recasens 1996; 2014a), evidenced in modern French. Moreover, Modern French alternations between forms such as *nouvel ami* / *nouveau copain* ‘new friend / pal’ and *bel ami* / *beau pays* ‘beautiful friend / country’ can accordingly be posited to evidence a once active rule of lateral allophony in Old French in which prevocalic /l/ (or syllable-initial /l/ after resyllabification) was realized as [l], in contrast to preconsonantal (or syllable-final) /l/ which was realized as [ɫ], with only the latter being subject to subsequent vocalization.

In summary, this darkening of Old French [l] to [ɫ] syllable-finally would thus lend support to the claim that syllable-final dark [ɫ]s in CCS could have resulted naturally, independent of contact with Catalan, due to the cross-linguistic propensity for lateral velarization syllable-finally (cf. Browman & Goldstein 1995; Recasens 2012; Recasens & Espinosa 1995; Van Hofwegen 2009).

2.1.4. Status of [ɫ] in Barcelonan CCS

Though experimental studies on the presence, use, and perceptions of Barcelonan CCS [ɫ] are generally lacking, a variety of studies have nonetheless offered more impressionistic descriptions of Barcelonan CCS [ɫ] that allude to its modern status, which will be empirically

assessed in the present dissertation.

Sinner (2002) conducted 52 interviews with Barcelonan Catalan-Spanish bilinguals and Madrid Spanish monolinguals ages 27-41 regarding phonetic, morphological, and syntactic features of Catalanized Spanish of which they were aware, as well as their opinions on the Spanish of Catalan speakers. Both Madrid monolinguals and Barcelonan bilinguals named [ɫ], one of only two features (the other being the use of definite articles such as *el* or *la* before given names [e.g. *la Sofia, el Marcos*]) of which speakers were overtly aware outside of Catalonia. Madrid speakers reported knowledge of CCS [ɫ] from television and radio shows that parodied Catalan speakers and their Spanish. Despite demonstrating virtually no knowledge about the Spanish of Catalan speakers, Madrid speakers commented that Catalans use less vocabulary than other Spaniards, and additionally that their Spanish is poorer than other Spaniards' Spanish (Sinner 2002: 165). Madrid interviewees additionally expressed a series of negative opinions about how CCS sounds, which accordingly may directly reflect perceptions of CCS [ɫ], since this is the only phonetic feature of CCS of which they had any overt awareness:

- “...*hablan como muy de pueblo, muy raro* [they talk very much like from the countryside, very strange]” (Sinner 2002: 165);
- “...*tienen una pronunciación dura, áspera* [they have a harsh, rough pronunciation]” (Sinner 2002: 165);
- “*Es feo, no suena nada bonito. Me suena muy agresivo, no tiene la gracia que tiene el español de aquí, es muy tom-tom-tom* [It's ugly, it doesn't sound pretty at all. It sounds very aggressive to me, it lacks the elegance of the Spanish that is spoken here, it's very boom-boom-boom]” (Sinner 2002: 165).

With respect to the Catalan-Spanish bilinguals, some admitted to feeling the overt obligation to correct or adjust their Spanish pronunciation when speaking in public, and additionally felt that CCS was rustic sounding (Sinner 2002: 166). If one such adjustment were indeed the

lightening of dark [ɫ], this would lend strong support to the classification of CCS [ɫ] as a *linguistic stereotype* (cf. Johnstone & Kiesling 2008: 8; Labov 1972; 2001), or a feature showing social stratification (i.e., feature of Catalans' speech), a style correlate (i.e., reduced use in formal or more careful speech), and considerable overt awareness and negative social commentary (i.e., overtly stigmatized as 'rustic' not only by speakers within the speech community, but also by those outside of Catalonia).

Wesch (1997) examined possible effects of age and social class on the frequency of dark [ɫ] in Barcelonan CCS. Having recorded spontaneous speech samples from 24 Barcelonan CCS speakers, Wesch (1997: 296, 298) reported that in the casual and formal speech of middle and upper class Barcelonans ages 25-55, [l] and [ɫ] occurred in diastratic variation, such that [ɫ] was less frequent in the speech of the younger speakers.⁴⁰ These findings may be analyzed as evidence of a possible linguistic change in progress whereby CCS [ɫ] is becoming less frequent over time, logically following as an effect of an increasing social stigma associated with it (cf. Sinner 2002). Moreover, such an outcome would interestingly run parallel to that attested in the Spanish of Majorcan Catalan bilinguals, for whom Pieras (1999: 235, 238, 240) and Simonet (2008: 308) report a greater avoidance of [ɫ] by youth female speakers in comparison with males as motivated by a stigma of rurality, old age, and lower social class associated with [ɫ]. It should be additionally highlighted that in Majorcan CCS, lateral velarization was stronger and more frequent in the speech of Catalan-dominant bilinguals, consistent with an account of lateral velarization as motivated by contact with Catalan (Pieras 1999: 236-237; Simonet 2008: 306).

Lastly, and most recently, Davidson (2012a; 2014a) conducted an empirical pilot study (for the present dissertation) concerning the effects of both social factors (age, gender, Catalan exposure and use) as well as linguistic factors (syllable position, stress, prosodic

⁴⁰ Since no details of phonetic or otherwise acoustic analyses are reported, it is assumed that tokens of light [l] and dark [ɫ] were identified by auditory impressionistic analysis by the researcher.

boundary, morphological status, following consonant place of articulation, prior vowel frontedness, and cognate status) on both the overall degrees of Barcelonan CCS /l/ velarization, as well as the frequency of actual productions of discrete [l] and [ɫ] tokens.

Having recorded formal speech samples from a total of 36 Barcelonan CCS speakers (ages 18-45), Davidson (2012a: 329-331) reported stronger degrees of velarization to correlate with higher levels of Catalan exposure and use. While higher degrees of /l/ velarization were found for younger speakers and females overall, it was also found that younger females within Barcelona had developed an innovative avoidance of higher degrees of lateral velarization as compared with men (Davidson 2012a: 330, 334-335). A closer inspection of the discrete [ɫ] production of these younger females revealed that [ɫ] was most favored by speakers of high Catalan exposure and use, and progressively disfavored by speakers with lesser Catalan exposure and use (Davidson 2014a: 234-235, 239). This was argued to be consistent with the hypothesis that [ɫ] arose as an L2-feature of the Spanish of Catalan-dominant bilinguals and subsequently diffused to populations of greater Spanish dominance, constrained in use according to a possible negative social stigma attached to it (Davidson 2014a: 241). As for the effects of the aforementioned linguistic factors, degrees of /l/ velarization were found to be strongest in the context of a following velar consonant, prior non-front vowel, and as part of a determiner-noun sequence (Davidson 2012a: 335). A closer inspection of the discrete [ɫ] production of younger females revealed that [ɫ] was additionally sensitive to Catalan cognate effects, specifically in the speakers of highest Catalan exposure and use (Davidson 2014a: 236, 240).

Summarizing the aforementioned studies on Barcelonan CCS [ɫ] production, the status of modern dark [ɫ] is still not very clear (no pun intended⁴¹). Though Wesch (1997) suggests that [ɫ] is becoming less frequent over time, a linguistic change in progress

⁴¹ Kudos to Daniel Scarpace for this gem.

consistent with the proposition of a social stigma attached to [ɸ] (cf. Sinner 2002), the results of Davidson (2012a; 2014a) suggest that [ɸ] remains a frequent and competitive CCS variant of /l/, in spite of a linguistically conservative avoidance of high degrees of lateral velarization by youth females within Barcelona in comparison with males. In fact, five of the seven youth female speakers with the highest Catalan dominance used [ɸ] in formal speech more frequently than [l] (one of which nearly categorically so, with 98% of all /l/ tokens produced as [ɸ]) (Davidson 2014a: 234, 239). Nonetheless, the relative lack of [ɸ] production on behalf of youth females with the highest Spanish dominance (i.e., [ɸ] production rates from 0% to 13% [Davidson 2014a: 234]) is more consistent with Wesch's (1997) findings of a declining frequency of [ɸ] production. In order to more definitively ascertain the status of Barcelonan CCS [ɸ], the present dissertation shall examine formal and informal speech, as well as collect perception and attitudinal data on CCS [ɸ] and Catalanized Spanish more generally. Moreover, given the likely difference in social status or value between CCS [ɸ] and [z], their joint study in the present investigation allows us to examine whether or not the origin and/or path of diffusion of these features in CCS can be linked to their distinct social values (i.e., that the process of propagation of stigmatized variants may be unique from non-stigmatized variants).

2.2. Spanish Fricative Production and Intervocalic Alveolar Fricative Voicing

In the following subsections, we present an overview of Spanish alveolar fricatives, detailing articulatory mechanisms posited to mediate voicing.⁴² Additionally, we discuss two possible accounts for the presence of intervocalic fricative voicing in CCS. The first account ascribes this phenomenon in CCS to a language-external source, namely contact with Catalan. In contrast, the second account discusses this phenomenon as motivated by language-internal

⁴² Note that since alveolar /s/ is the only Catalan sibilant shared by Spanish with a normal distribution (as Spanish /f/ is absent word-finally save in foreign borrowings [Hualde et al. 2010: 74]), the phenomenon of intervocalic fricative voicing discussed in this paper refers exclusively to alveolar fricatives. The terms 'intervocalic fricative voicing' and 'intervocalic /s/-voicing' are henceforth used synonymously, both referring to alveolar fricatives.

mechanisms, namely lenition, in the context of any Spanish variety (as opposed to strictly those in contact with Catalan or other languages). Moreover, we present an overview of prior CCS research concerning intervocalic fricative voicing in order to best characterize the present status of [z] in Barcelonan CCS.

2.2.1. Linguistic Characterizations of Spanish /s/

With respect to the production of alveolar fricatives, Northern-Central Peninsular Spanish features an apical-alveolar voiceless /s/, articulated with a gesture of the tongue-tip toward the alveolar ridge (Dalbor 1997: 224; Hualde 2014: 147; Martínez Celdrán & Fernández Planas 2007: 110; Quilis 1981: 234-235). 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.jér.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.ɬos] ‘ducks’) (Azevedo 1992: 77; Dalbor 1997: 225; Hualde 2014: 154-155; Hualde et al. 2010: 74; Navarro Tomás 1918: 83; Morgan 2010: 248; Pieras 1999: 212; Schwegler, et al. 2010: 171; Teschner 1996: 102-103).⁴³ 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,

⁴³ Note that one complication with Spanish /s/ voicing assimilation is the sequence of /s/ + /r/, which shows relatively variable (and often lenited) realizations beyond the expected [zr] due to the highly constrained incompatible articulatory (cf. Recasens 1995; 1999; Recasens & Pallarès 1999; Recasens et al. 1997; Solé 2002a) and aerodynamic (cf. Ohala, Solé, & Ying 1998; Solé 1998; 2002b) requirements associated with each segment’s production.

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).

The prescriptive treatment of [s] and [z] allophony as absolute (i.e., only [z] before voiced [semi]consonants, only [s] in all other contexts) has recently been questioned, however, in light of experimental research using more refined acoustic analyses. In particular, instances of [s], partially voiced [s̥], 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 (cf. Schmidt & Willis 2011), Highland Colombian Spanish (cf. García 2013), Quito Spanish (cf. Strycharczuk, van't Veer, Bruil, & Linke 2014), and in the speech of a group of (presumably monolingual or Spanish-dominant) speakers from Madrid, Valencia, and Galicia (cf. Clegg & Strong 1992). Although Clegg & Strong (1992: 32) declare "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" (see also Cepeda 1990; Dalbor 1997: 227-228; Obaid 1973: 63; Teschner 1997: 150; Torreblanca 1978; 1986), the aforementioned studies attesting to a lack of voicing before voiced consonants in several Spanish varieties merits a broader generalization, namely that Spanish /s/ voicing assimilation is highly variable, as well as gradient.

The treatment of Spanish /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 (cf. Jesus & Shadle 2003), English (cf.

Smith 1997; Stevens, Blumstein, Glicksman, Burton, & Kurowski 1992), Catalan (cf. Carrera-Sabaté 2009), Italian and Dutch (cf. Rivas 2006), and several varieties of Spanish including Caleño Spanish (cf. File-Muriel & Brown 2011), Argentinean Spanish (cf. Gradoville 2011; Rohena-Madrado 2011), Madrid Spanish (cf. Torreira & Ernestus 2012), Castilian Spanish (cf. Romero 1999), and New York City Spanish (cf. Erker 2012). Within this line of research, fricative voicing assimilation is modeled within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995) 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 (cf. Browman & Goldstein 1989; 1991; 1995), resulting in a single vocal fold adduction gesture that extends fully into the /s/ segment, yielding [z] (Campos-Astorkiza 2014: 19; Hualde 2014: 107; 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 gradually reduced to a single glottal gesture.

Although we shall treat intervocalic fricative voicing in the present CCS data as a gradient phenomenon, it is important to consider that discussions of fricative voicing often expound differences in voicing degrees across language varieties as a binary distinction between varieties that do or do not phonemically oppose /s/ and /z/, or varieties that do or do not feature each of /s/ and /z/ (cf. Benet et al. 2012: 399-400; Stevens et al. 1992: 2979). Moreover, it appears that individual dialects of a language may show variation in the grade of voicing exhibited: whereas Campos-Astorkiza (2014: 22-23) noted that the distribution of voicing degrees observed for /s/ preceding a voiceless consonant in Northern-Central Peninsular Spanish was highly skewed, with extremely few tokens exhibiting voicing lasting

more than 20% of each token's total duration, the parallel distribution of voicing degrees in Mexico City Spanish was not similarly sharply skewed (Schmidt & Willis 2011: 6), permitting the interpretation that the [s] of Northern-Central Peninsular Spanish may be less voiced than the [s] of Mexico City Spanish.⁴⁴ Accordingly, the use of the terms voiceless [s] and voiced [z] throughout this dissertation reflects a convenience to discuss (considerably) less and (considerably) more voiced /s/ productions respectively, without suggesting the presence of a categorical boundary between the two (at least in Spanish, which does not phonemically contrast alveolar fricatives by voicing degree).

2.2.2. Catalan (and Other Languages) as a Source for Spanish Intervocalic Fricative Voicing

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' [zɛ́ʎ] (Spanish *celo* [θé.lo]) / *cel* 'sky' [séʎ] (Spanish *cielo* [θjé.lo]) and *pesar* 'to weigh' [pə.zá] (Spanish *pesar* [pe.sár]) / *passar* 'to pass' [pə.sá] (Spanish *pasar* [pa.sár]). 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).⁴⁵ 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: 371-372, 393-394;

⁴⁴ This interpretation is somewhat speculative, as the full details regarding the voicing distributions observed in the Northern-Central Peninsular and Mexico City Spanish data were not reported in their entirety by either of Campos-Astorkiza (2014) or Schmidt & Willis (2011). Both offer some descriptions of these distributions as a means of establishing their coding schemes for tokens treated as voiceless [s] or voiced [z]. Still, the disparate distributions of /s/ voicing are nonetheless inferable from the information reported in each study, and would parallel the aforementioned discussion (see section 2.1.1) of light [l]s of certain language varieties being lighter or darker than the light [l]s of other language varieties.

⁴⁵ One may note that a reduced number of minimal pair phrases distinguished by word-final voicing (subject to liaison) do exist in Catalan, such as *les oques* 'the geese' [lə.zó.kəs] and *les soques* 'the logs' [lə.só.kəs] (Arnal 2011: 19).

Hualde & Prieto 2014: 109; Julià i Muné 2008: 66-67; Pieras 1999: 212; Prieto 2004: 208, 216; Recasens 2014b: 239-240; Wheeler 2005: 147-149, 162). Bonet & Lloret (1998: 118-119) notes that this regressive voicing assimilation is post-lexical and presents no exceptions.

Thus, whereas 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/]), intervocalic [z] is unattested as a systematic feature of any monolingual Spanish variety. This accordingly sets up an interesting pair of opportunities for bi-directional contact influence (i.e., L1-transfer), contingent on syllable position. Productions of Spanish *pesar* ‘to weigh’ or *casa* ‘house’ as [pe.zár] and [ká.za] on the part of an L1-Catalan speaker would evidence the transfer of a Catalan phoneme (/z/) into Spanish,⁴⁶ whereas productions of Catalan *pesar* ‘to weigh’ or *casa* ‘house’ as [pə.sá] and [ká.sə] on the part of an L1-Spanish speaker would evidence the substitution of Spanish /s/ for Catalan /z/, effectively eliminating the phonemic voicing contrast in Catalan. In contrast, the consequences of bi-directional contact influence in word-final position would, for the most part, be phonetic.⁴⁷ 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 phonetic transfer (via the transfer of a Catalan or Spanish [respectively] phonotactic voicing rule).

Reports of both cases of transfer (though unfortunately all save Davidson [2012b;

⁴⁶ The transfer of word-initial and word-medial Catalan /z/ into Spanish through cognate words like *pesar* ‘to weigh’ would, most generally, not give rise to minimal pairs between Spanish /s/ and /z/, and thus not create a productive voicing contrast. Exceptional cases would include Spanish homophones for which only one meaning was expressed in Catalan by a cognate word with /z/. For example, Spanish *mesa* ‘board’ (Catalan *mesa* [with /z/]) would be produced with /z/, whereas Spanish *mesa* ‘table’ (Catalan *taula* [without /z/]) would be produced with /s/. Still, a vast amount of quasi-minimal pairs would be created, such as Spanish *queso* ‘cheese’ [ké.so] (Catalan *formatge* [fúr.má.ðʒə]) and *peso* ‘I weigh’ [pé.zo] (Catalan *peso* [pé.zu]).

⁴⁷ The exceptional cases here (see also footnote 45 in this section) include phrases such as Spanish *las alas* ‘the wings’ (Catalan *les ales*) and Spanish *la salas* ‘you salt it’ (Catalan *la sales*). An L1-Catalan speaker that transferred the Catalan prevocalic word-final voicing rule into Spanish would innovate these kinds of post-lexical minimal pairs (cf. Bradley 2005; Bradley & Delforge 2006) (e.g. [la.zá.las] ‘the wings’ ; [la.sá.las] ‘you salt it’), whereas an L1-Spanish speaker that transferred the Spanish prevocalic word-final [s] into Catalan would eliminate these post-lexical minimal pairs (e.g. [lə.sá.ləs] ‘the wings / you salt it’).

2014a; forthcoming] do not distinguish between the word-initial/medial and word-final positions) are abundant (cf. Arnal 2011: 19; Benet et al. 2012; Bonet & Lloret 1998: 119; Casanovas Català 1995: 56; Davidson 2012b; 2014a; forthcoming; Hualde 2014: 155; Payrató 1985: 105; Pieras 1999; Serrano Vázquez 1996a: 379; Wesch 1997: 298; Vann 2001: 124; Sinner 2002: 163). Casanovas Català (1995: 56-57) describes intervocalic fricative voicing as one of the most salient phonetic features of the Spanish of Catalans, alongside lateral velarization, appearing inversely proportional to the level of Spanish competence (i.e., with less knowledge of Spanish, more Spanish intervocalic [z] production). Indeed, Bibiloni's (2000) *Guia de correcció fonètica* [Guide to Phonetic Correction] includes a tutorial to help Spanish speakers to stop substituting Spanish /s/ in for Catalan /z/, and additionally makes special reference to Catalan's word-final prevocalic voicing rule:

“Ara volem cridar la vostra atenció sobre un defecte de pronunciació que s'està estenent actualment i que és un defecte important. Quan una paraula acaba en essa (en principi sorda) i és seguida d'una altra paraula començada en vocal, aquella essa torna sonora. No pronunciar aquesta essa com a sonora és un defecte que cal evitar [Now we want to call your attention to a pronunciation defect that is presently spreading and that is an important defect. When a word ends in s (at least initially voiceless) and is followed by another word beginning with a vowel, that s becomes voiced. To not pronounce this s as voiced is a defect that one must avoid]” (Bibiloni 2000, underlining preserved from original text).

Though more detailed information on CCS intervocalic [z] production is offered in section 2.2.4, the transfer of Spanish and Catalan intervocalic fricatives is considered another hallmark of language contact in the bilingual Catalan-Spanish community (cf. Arnal 2011; Casanovas Català 1995; Prats et al. 1990; Sinner 2002), and accordingly constitutes a strong case for contact-induced innovation (additionally recall from section 1.2.2 that contact innovations are in fact expected in the Catalan-Spanish bilingual setting).

Another contact variety of Spanish that has attested systematic intervocalic [z] is that

of English-Spanish bilinguals, namely English speakers learning Spanish as a second language in the United States. As American English exhibits both /s/ and /z/ (Goldstein 2001; Jongman 1989; Maddieson 1984; Schmidt 2014; Smith 1997, among many others), another relatively straightforward opportunity for bi-directional transfer is available. English-Spanish bilinguals dominant in English or Spanish may respectively transfer English /z/ into Spanish or substitute Spanish /s/ for English /z/. Not only have attestations of both kinds of imposition (i.e., into Spanish from English or into English from Spanish) been reported (cf. Eckman, Iverson, & Song 2014; Goldstein 2001; Menke & Face 2012; Sawyer 1959; Schmidt 2008; Thompson 1975), but additionally, the voicing of intervocalic /s/ in Spanish (e.g. *presidente* ‘president’ with [z]) is referenced in explicit instruction in several Spanish phonetic textbooks for U.S. students (e.g. Dalbor 1997; Hualde 2005; 2014; Hualde et al. 2010; Morgan 2010; Schwegler et al. 2010). An entire section of Teschner (1997) is even devoted to this L2-speech feature, entitled “*No se emplee el alófono sonoro [z] excepto ante consonantes sonoras* [Don’t Use the Voiced Allophone [z] Except Before Voiced Consonants].”

In summary, that a parallel situation of intervocalic fricative transfer exists for Spanish-English bilinguals offers an additional indication that the equivalent contact influence is certainly not out of the question (phonologically or phonetically speaking) in the context of Catalan-Spanish bilinguals. Before discussing an account of CCS intervocalic [z] production that appeals exclusively to endogenous (i.e., Spanish language-internal or universal, cross-linguistic) motivations in the following subsection, however, it is necessary to highlight that another contact variety of Spanish has attested systematic intervocalic fricative voicing, namely Spanish in contact with Quechua varieties in Highland Ecuador and Colombia (henceforth HEC Spanish) (cf. Bradley 2005; Bradley & Delforge 2006; Canfield 1962: 81, as cited in Obaid 1973: 63; Chappell 2011; Colina 2009; Córdoba 1996: 191-192;

Dalbor 1997: 227; Hualde 2014: 155; Lipski 1989; 1994: 248; Montes Giraldo 1984; Torreblanca 1986: 68; Flórez 1963: 268; García 2013; Navarro Tomás 1962: 81; Robinson 1979; Strycharczuk et al. 2014; Toscano Mateus 1953: 79). Curiously, the only research of which we are aware that includes a discussion (albeit it minimal) of whether or not contact with Quechua varieties may have played a role (as the source language) in the development of Spanish intervocalic [z] is Córdoba (1996), Lipski (1989), and Toscano Mateus (1953). All acknowledge (the latter two albeit in footnotes) that the Quechua spoken in Highland Ecuador (called Kichwa) indeed exhibits a phonemic voicing distinction between voiceless /s/ and voiced /z/, at least word-medially (Córdoba 1996: 192; Lipski 1989: 52; Toscano Mateus 1953: 23). Accordingly, Córdoba (1996: 192) and Toscano Mateus (1953: 23, 78) posit that select HEC borrowings from Kichwa, such as *puzu* ‘gray-haired,’ *puzun* ‘belly,’ and *jizi* ‘beaming’ are realized with [z] as a reflection of Kichwa phonology. However, since prevocalic word-final voicing of /s/ does not occur in Kichwa (Lipski 1989: 51), yet in fact is the only environment in which Kichwa Spanish intervocalic [z] is systematically found (Chappell 2011: 60-61; Lipski 1989: 50; 1994: 248; Robinson 1979: 137-138; Strycharczuk et al. 2014: 3; Toscano Mateus 1953: 79), Lipski (1989: 52) does not champion an account of contact-induced innovation.

Though we shall discuss the endogenous accounts posited for intervocalic [z] in HEC Spanish in the following subsection, it should be noted that to our knowledge, no empirical research has been performed that seeks to establish an effect of language contact on HEC intervocalic [z], such as [z] production mediated by Kichwa dominance. Thus, even in light of accounts of this phenomenon as strictly independent of contact with Kichwa, without further investigation it seems premature to definitively rule out Kichwa as a source language for this HEC feature. Of course, any evidence supporting Kichwa’s role in this Spanish innovation would bolster the case for a parallel contact-induced innovation in the Catalan-

Spanish context, from a purely phonological or phonetic standpoint.

2.2.3. CCS Intervocalic Fricative Voicing as a Language-Internal Phenomenon

Before discussing endogenous accounts Spanish intervocalic [z] that are posited for monolingual varieties of Spanish, we shall briefly conclude the prior discussion of the case of HEC Spanish, which, despite being a contact variety of Spanish, nonetheless has been invoked in an account of Spanish intervocalic [z] as strictly internally motivated. One such claim is that of Robinson (1979), who proposes that HEC intervocalic [z] is an archaism left from the Spanish colonizers of Latin America, in whose Spanish the Medieval Spanish voicing contrast between /s/ and /z/ was still active (Robinson 1979: 138).⁴⁸ This account has been subject to criticism, however, by Torreblanca (1968: 68) and Montes Giraldo (1984: 221-227), who note that the sporadic production of HEC intervocalic [z] outside of prevocalic word-final contexts (e.g. word-initial and word-medial intervocalic contexts), and additionally the systematic voicing of /s/ to [z] prefix-finally (e.g. *desalar* ‘to de-wing’) in the Ecuadorian sub-dialect of Cuenca (cf. Bradley 2005; Bradley & Delforge 2006; Córdoba 1996: 191; Robinson 1979: 137-138; Lipski 1989: 5; Toscano Mateus 1953: 79) are difficult to account for if HEC intervocalic [z] were an archaism not subject to any other motivations. Instead, HEC intervocalic [z] is posited as an independent innovation resulting from language-internal tendencies of lenition or articulatory weakening (Torreblanca 1968: 69; Montes Giraldo 1984; see also Torreblanca 1978: 501), an account which is supported by the finding of a sensitivity to speech rate (favoring greater voicing degrees in faster speech) in both Quito Spanish (Strycharczuk et al. 2014: 24, 34) as well as Highland Colombian Spanish (García: 2013: 82-84).

⁴⁸ Loanwords from Spanish into Ecuadorian Quechua that preserve the /z/ from Colonial Spanish form the basis for this account, including *cazarana* (Spanish *casarse*) ‘to get married’ and *cazuna* (Spanish *hacer caso*) ‘to pay attention’ (Robinson 1979: 138; Toscano Mateus 1953: 23, 78).

Indeed, an account for Spanish intervocalic [z] as a product of articulatory weakening and gestural coordination mechanisms is precisely what has been posited for monolingual varieties of Spanish as an extension of voicing assimilation in the context of a following voiced consonant within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995; Hualde 2014: 106-107; Hualde & Prieto 2014; Torreblanca 1968; Torreira & Ernestus 2012). More specifically, in a sequence of vowel + /s/ + vowel, the laryngeal gesture for the voiceless fricative (vocal fold abduction) conflicts with that of each of the adjacent voiced vowels (vocal fold adduction). Particularly in fast speech, if the magnitude of the vocal fold abduction for voiceless /s/ is undershot, and/or if the laryngeal gesture for /s/ is encroached upon by vocal fold adduction gestures of each of the neighboring vocalic segments, this can result in uninterrupted voicing throughout the entire sequence, yielding intervocalic voiced [z] (Davidson 2012b: 16; 2014a: 230; forthcoming).

This account of Spanish intervocalic fricative voicing is corroborated by acoustic analyses of both conversational (i.e., semi-spontaneous, somewhat casual) and hyper-casual (i.e., spontaneous, extremely casual [participants unaware of being recorded]⁴⁹) speech from monolingual Madrid Spanish speakers (cf. Hualde & Prieto 2014; Torreira & Ernestus 2012). A more modest frequency of fully (or uninterrupted) voiced [z] occurring in just over 8% of all intervocalic /s/ tokens was found in conversational Madrid speech (cf. Hualde & Prieto 2014: 116), whereas Torreira & Ernestus (2012: 136, 138) reported that 34% of all intervocalic /s/ tokens showed full (or uninterrupted) voicing in hyper-casual speech, and were additionally sensitive to the speech rate (favoring more voicing with faster speech rates). For (monolingual) Mexico City Spanish, Schmidt & Willis (2011: 7) found that intervocalic voiced [z] productions comprised 9% of all intervocalic /s/ tokens recorded from

⁴⁹ This was accomplished by covering up lights and other visual indications of recording equipment being on with tape, placing unplugged cables by outlets to trick participants into believing recording equipment devices were not plugged in, and by using a confederate who left the room after being informed that a microphone was defective and that recording could not take place until a new microphone was procured (Torreira & Ernestus 2010: 2982-2983).

conversational speech, nearly identically mirroring the frequency found in the equivalent speech style in Madridian Spanish (cf. Hualde & Prieto 2014). Moreover, recall that voicing degrees were greater in faster speech styles even in the contact varieties of Quito Spanish (Strycharczuk et al. 2014: 24, 34) and Highland Colombian Spanish (García: 2013: 82-84).

Accordingly, the wider generalization that these data support is that Spanish intervocalic /s/ voicing is a natural phenomenon, favored in faster and more casual speech styles, that is likely to be observed sporadically in any Spanish variety (notwithstanding aspiration, elision, or other lenition phenomena involving /s/), independent of contact with other languages. Impressionistic observations of sporadic intervocalic /s/ voicing in a rather diverse group of other monolingual Spanish varieties stand as further support for this claim, including the Spanish of Monterrey, Guadalajara, San José (cf. Obaid 1973: 63; see also Dalbor 1997: 228), Córdoba, the Canary Islands, Navarra, Castellón, Extremadura, Ávila, Badajoz, Huelva, Toledo, Albacete, Murcia, Guanajuato, Yucatán, El Salvador, Panama (cf. Torreblanca 1978 and references within), Salamanca, and Cáceres (cf. Espinosa 1935; Torreblanca 1978: 501). Furthermore, Hualde & Prieto (2014: 111) note that the voicing (and even devoicing) of intervocalic fricatives is a “natural, unremarkable phenom[on],” evidenced time and time again in the evolution of several Romance varieties, fully accounted for by lenition and articulatory mechanisms.⁵⁰

In summary, the aforementioned evidence of intervocalic fricative voicing in monolingual Spanish varieties, particularly as mediated by speech rate (even in HEC Spanish), offers support to an account of CCS intervocalic [z] as an innovation that may have arisen completely independently of contact with Catalan, accounted for by strictly language-internal mechanisms of lenition within gestural phonology (cf. Browman & Goldstein 1989;

⁵⁰ Torreblanca (1986) even posits that the intervocalic /s/ voicing observable in the Toledo region may stand as a phonetic archaism from Medieval Spanish, constituting yet another appeal to strictly language-internal motivations behind this phenomenon. Moreover, prevocalic word-final fricative voicing is attested cross-linguistically as a relatively natural linguistic feature in languages such as Polish, West-Flemish, Breton, and Slovak (Strycharczuk & Simon 2013: 564).

1991; 1995) that are grounded in linguistic universals (i.e., not specific language-internal features of solely Spanish [or even solely Catalan for matter]).

2.2.4. Status of [z] in Barcelonan CCS

Though experimental studies on the presence, use, and perceptions of Barcelonan CCS intervocalic [z] are generally lacking, a variety of studies have nonetheless offered more impressionistic descriptions of Barcelonan CCS intervocalic [z] that allude to its modern status, which will be empirically tested in the present dissertation.

Sinner (2002) conducted 52 interviews with Barcelonan Catalan-Spanish bilinguals and Madridian Spanish monolinguals ages 27-41 regarding phonetic, morphological, and syntactic features of Catalanized Spanish of which they were aware, as well as their opinions on the Spanish of Catalan speakers. Intervocalic [z] was only named as a CCS feature by Barcelonan bilinguals (Sinner 2002: 164), and thus unlike [ɸ] (refer back to section 2.1.4), overt awareness of CCS intervocalic [z] does not seem to have extended beyond the bilingual Catalan-Spanish community. Accordingly, since negative commentary toward CCS pronunciation on the part of Madridian monolinguals was most likely not referencing intervocalic [z] (since they had no knowledge of any phonetic CCS features beyond [ɸ] [Sinner 2002: 164]), it may be the case that CCS intervocalic [z] is a *linguistic indicator* or *linguistic marker* (cf. Johnstone & Kiesling 2008: 8; Labov 1972; 2001), or a feature showing social stratification (i.e., feature of Catalans' speech) and respectively either the absence or presence of a style correlate (i.e., reduced use in formal or more careful speech).

Wesch (1997) examined possible effects of age and social class on the frequency of intervocalic voiced [z] in Barcelonan CCS. Having recorded spontaneous speech samples from 24 Barcelonan CCS speakers, Wesch (1997: 296) reported intervocalic [z] as an

extremely frequent variant without any indications of social stratification.⁵¹ This finding is echoed in Pieras (1999: 243-245) for the Majorcan Catalan-Spanish bilingual context. Pieras (1999: 243-245) found that intervocalic [z] production, although frequent, did not vary across age groups, gender, or even language dominance groups. Individual variation was high, with some speakers producing intervocalic [z] with complete consistency, others with less consistency, and others not producing it even once, none of which was linked to social factors. Pieras (1999: 244) concluded that intervocalic [z] in Majorcan CCS is a linguistic indicator that differentiates the bilingual Majorcan speech community from monolingual varieties of Spanish that do not exhibit this bilingual speech feature.

Lastly, and most recently, Davidson (2012b; 2014a; forthcoming) conducted an empirical pilot study (for the present dissertation) concerning the effects of both social factors (age, gender, Catalan exposure and use) as well as linguistic factors (syllable position, stress, accentual unit, morphological status, and cognate status) on both the overall degrees of Barcelonan CCS /s/ voicing, as well as the frequency of actual productions of discrete [s] and [z] intervocalic tokens.

Having recorded formal speech samples from a total of 36 Barcelonan CCS speakers (ages 18-45), Davidson (2012b: 23-24) reported that stronger degrees of voicing correlated with higher levels of Catalan exposure and use. While higher degrees of /s/ voicing were found for younger speakers and females overall, it was found that over time (within an apparent time construct), younger speakers with lower levels of Catalan use and exposure had increased their overall degree of /s/ voicing to match that of speakers with higher levels of Catalan use and exposure (Davidson 2012b: 24-26). A closer inspection of the discrete [z] production of younger females revealed that while [z] was most favored by speakers with high Catalan exposure and use and progressively disfavored by speakers with lesser Catalan

⁵¹ Since no details of phonetic or otherwise acoustic analyses are reported, it is assumed that intervocalic tokens of voiceless [s] and voiced [z] were subject to auditory impressionistic analysis by the researcher.

exposure and use, a select portion of speakers with the lowest Catalan exposure and use exhibited [z] production at rates matching those of speakers with the most Catalan exposure and use (Davidson 2014a: 233-235, 239; forthcoming). This was argued to be consistent with the hypothesis that intervocalic [z] arose as an L2-feature of the Spanish of Catalan-dominant bilinguals and is currently participating in a change in progress in which younger Spanish-dominant bilinguals (led by females) are adopting [z] over time (Davidson 2012b: 47-48; 2014a: 241; forthcoming). As for the effects of the aforementioned linguistic factors, intervocalic /s/ voicing was favored word-finally, across unstressed syllables, and in sequences of noun/verb + adjective/adverb (Davidson 2012b: 28-32; 2014a: 237-239; forthcoming).

Summarizing the aforementioned studies on Barcelonan CCS intervocalic [z] production, the status of modern [z] is still somewhat unclear. Though Wesch (1997) (as well as Pieras [1999] for Majorcan CCS) no social stratification associated with Barcelonan CCS [z], the results of Davidson (2012b; 2014a; forthcoming) suggest that this feature is being actively adopted by Spanish-dominant bilinguals, albeit nonetheless more common in the speech of Catalan-dominant bilinguals. Still, Wesch's (1997: 296) report of "*un sinfin de ejemplos* [an endless number of examples]" of intervocalic [z] is corroborated by voicing rates above 75% for select Catalan-dominant and Spanish-dominant speakers attested in Davidson (2012b: 41; 2014a: 233-234; forthcoming), which additionally may evidence a lack of negative social value associated with intervocalic [z] (cf. Sinner 2002). In order to more definitively ascertain the status of Barcelonan CCS [z], the present dissertation shall examine formal and informal speech, as well as collect perception and attitudinal data on CCS intervocalic [z] and Catalanized Spanish more generally.

2.3. Synthesis of Research on CCS [ɸ] and [z]: Research Questions

Reviewing the wide body of research on both lateral velarization and intervocalic fricative voicing in CCS and other contact varieties of Spanish, monolingual varieties of Spanish, and other languages featured the previous subsections of this chapter, several key similarities and differences between these two phenomena emerge.

With respect to similarities between lateral velarization and intervocalic fricative voicing, their status as frequent and systematic (rather than sporadic) features in Spanish appears restricted to contact varieties, namely CCS, Spanish in contact with English, and for intervocalic [z], HES. Although empirical research investigating Quechua as a source language for HES intervocalic [z] is lacking, both [ɸ] and [z] have been analyzed as products of imposition (or L1-transfer) from Catalan and English, further strengthening their classification as contact variants in Barcelonan CCS (cf. Arnal 2011; Báez de Aguilar 2008; Benet et al. 2012; Bonet & Lloret 1998; Casanovas Català 1995; Davidson 2012a; 2012b; 2014a; forthcoming; Hualde 2014; Moll 1961; Payrató 1985; Pieras 1999; Prats et al. 1990; Serrano Vázquez 1996a; Simonet 2008; Simonet 2010b; Sinner 2002; Wesch 1997; Vann 2000; 2001). Similarly, both features are attested as extremely frequent in Barcelonan CCS. For example, Barcelonan CCS speech analyzed in Davidson (2012b; 2014a; forthcoming) showed that for several Catalan-Spanish bilinguals, [ɸ] and [z] were competitive majority variants, produced over [l] and [s] well over 50% of the time, even approaching categorical (i.e. 100%) production in certain linguistic contexts. Moreover, an overt association between both features and CCS speech is attested within the bilingual Catalan-Spanish community (cf. Sinner 2002).

In spite of these similarities, however, the phenomena seem to diverge when it comes to their overall presence in monolingual varieties of Spanish, their possible social values in CCS, their overt recognition outside of the Catalan-Spanish bilingual community, and lastly

their usage by Spanish-dominant bilinguals in the Catalan-Spanish bilingual context. The sheer presence of intervocalic fricative voicing in Spanish varieties (as a sporadic feature) seems considerably greater than that of lateral velarization. Whereas we are unaware of any (even impressionistic) observations of lateral velarization outside of the Catalan-Spanish and English-Spanish bilingual contexts, reports of (sporadic) intervocalic fricative voicing exist for indeed an abundance of Spanish varieties across the Americas and the Iberian Peninsula (refer back to section 2.2.3 for the list of varieties and sources), which may suggest that regarding an account of strictly endogenous innovation, the latter phenomenon constitutes a stronger case than the former. With respect to these phenomena in the Catalan-Spanish bilingual context, negative overt social commentary (involving links to rurality, ugly or improper accent, and old age) has thus far been attested only for CCS [ɸ] (Pieras 1999; Simonet 2008; Sinner 2002), expressed even by monolingual Spanish speakers outside of the bilingual Catalan-Spanish community. It is precisely this lack of negative social commentary for CCS intervocalic [z] that is posited in Davidson (2014a) to account for divergent usage trends of [ɸ] and [z] by Spanish-dominant Barcelonan bilinguals (cf. Davidson 2012a; 2012b; 2014a; forthcoming). In contrast with [ɸ], for which Spanish-dominant bilinguals showed significantly lower usage rates (as well as velarization degrees) than Catalan-dominant bilinguals, intervocalic voicing degrees and discrete [z] production by Spanish-dominant bilinguals were found to match those of Catalan-dominant bilinguals, corroborated by an increase in voicing degrees by Spanish-dominant bilinguals in apparent time (Davidson 2012a: 329-331; 2012b: 24-26; 2014a: 234; forthcoming).⁵² It should be noted, however, that

⁵² Though the argument that different social values linked with [ɸ] and [z] are the impetus for their divergent usage patterns in Spanish-dominant bilinguals seems convincing enough, it is important to consider one last difference between lateral velarization and intervocalic fricative voicing that may additionally play a role in their divergent production trends. The very nature of lateral velarization and intervocalic fricative voicing, from a language acquisition perspective, is seemingly rather distinct. L1-Catalan speakers that acquire Spanish and L1-Spanish speakers that acquire Catalan are forced to acquire a new lateral category not existent in their first language, namely (and respectively) [l] or [ɸ] (cf. Flege 1995). In contrast, L1-Catalan speakers that acquire Spanish and L1-Spanish speakers that acquire Catalan do not acquire a new (alveolar) fricative category, since

in spite of the differences in usage patterns and social values attributed to each of dark [ɸ] and intervocalic voiced [z], since a style correlate has yet to be established for either feature, they must both be tentatively considered linguistic indicators. Still, since the aforementioned research suggests a possible difference between the degree of overt awareness associated with CCS [ɸ] and intervocalic [z], by studying them both comparatively, this dissertation is able to link differences in usage and distribution patterns (from which inferences regarding diffusion are made) to distinct social values afforded to each feature (particularly as linked to Labovian notions of indicators, markers, and stereotypes).

In summary, an abundance of prior research has alluded to the extensive presence of [ɸ] and intervocalic [z] in the Spanish of Catalan-Spanish bilinguals in Barcelona, a site of considerably intense language contact in Catalonia. These features are likely linked to very distinct social values in this speech community, and accordingly can serve as prime examples of how social values, perceptions, and attitudes toward specific language features and varieties can underpin observable language variation in a bilingual speech community. The juxtaposition of these features can be specifically used to directly apply the distinct notions of linguistic stereotypes, markers, and indicators, traditionally explored in monolingual communities (cf. Labov 1972; 2001), to language variation and change in a community characterized by widespread bilingualism. Moreover, accounts of contact-induced innovation as well as strictly endogenous innovation have been proposed for both features, which merits a deeper analysis of the language patterns associated with both phenomena in order to tease apart the language-external and language-internal contributions to their usage. In order to

[s] and [z] already exist as native allophones in both languages (albeit to different phonemes). Accordingly, the case of intervocalic fricative voicing involves the acquisition of a new set of phonotactic rules, rather than the acquisition of a new or foreign sound, and is accordingly somewhat of a different phenomenon than lateral velarization. As the teasing apart of social and strictly cognitive considerations underlying production patterns falls outside the scope of this dissertation, we echo Simonet's (2010a: 676) call for additional investigation into this matter: "...more research is needed on the sociophonetics of bilingualism before we can begin to tease apart the contributions of cognitive and social-indexical shaping forces in the behavior of bilingual individuals residing in bilingual speech communities."

accomplish these research objectives, the following research questions form the basis for the experimental methodology outlined in the following chapter:

RQ1: To what extent is each of lateral velarization and intervocalic fricative voicing present in modern Barcelonan CCS (as compared with non-contact, monolingual Spanish varieties)?

RQ2: What are the social (language-external) constraints affecting each of lateral velarization and intervocalic fricative voicing in Barcelonan CCS?

RQ3: What are the linguistic (language-internal) constraints affecting each of lateral velarization and intervocalic fricative voicing in Barcelonan CCS?

RQ4: Is there evidence of the diffusion of CCS dark [ɫ] and intervocalic voiced [z] across the bilingual Catalan-Spanish speech community? If so, is this diffusion ongoing (i.e., is there evidence of a linguistic change in progress)?

RQ5: What are the overt and covert social evaluations of CCS dark [ɫ] and intervocalic voiced [z]? How do these relate to social evaluations of “Catalanized Spanish” more generally? Additionally, how are differences in social values between the variants manifested in the paths of selection and propagation of each variant?

RQ6: What evidence is there to support an account of each of CCS dark [ɫ] and intervocalic voiced [z] as contact-induced phenomena? What evidence exists in favor of an endogenous account of each phenomenon?

CHAPTER 3: EXPERIMENTAL METHODOLOGY

In this chapter, we discuss the selection of linguistic and social factors incorporated into the investigation (as informed by the research detailed in chapter 2), thoroughly describe the selection and design of test instruments used to gather experimental (and formal), natural (and casual), and perceptual speech data on Barcelonan CCS lateral velarization and intervocalic fricative voicing, detail the methods of participant selection and sampling, and report techniques chosen for data analysis.

3.1. Linguistic Factors Explored for Barcelonan CCS /l/ and /s/ Production

3.1.1. Linguistic Constraints on Barcelonan CCS Lateral Velarization

The present investigation incorporates a set of four linguistic factors as motivated by prior (pilot) research by Davidson (2012a; 2014a), as well as that reported in Serrano Vázquez (1996), Vann (2001), and Wesch (1997). These factors are syllable position, place of articulation of surrounding segments (i.e., coarticulation effects with adjacent segments), word class, and Catalan cognate status. We define the levels of each of these factors below, which we note have been adapted from their original use in the aforementioned investigations in order to facilitate the fullest crossing of factors.

First, with respect to syllable position, it should be noted that Serrano Vázquez (1996), Vann (2001), and Wesch (1997) only offer examples of CCS [ɫ] production in word-final position, a context which has been reported to favor greater velarization degrees in Catalan (cf. Badia i Margarit 1984: 103-104; Casanovas Català 1995: 56; Hualde 1992: 373; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2014a: 20; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37; Recasens et al. 1995: 38; Wheeler 2005:

34) and several other languages (cf. Recasens 2012: 371; Recasens & Espinosa 1995: 3; Slomanson & Newman 2004: 209; Van Hofwegen 2009: 304), and which additionally is proposed to have conditioned velarization in all early Romance varieties, including Latin (Allen 1989: 33; Badia i Margarit 1984: 199; Grandgent 1991: 185-187; Niedermann 1953: 9; Pieras 1999: 242; Rasico 1981: 200; Recasens 1996; 2014a: 20-21). Accordingly, the present study investigates differences in /l/ production in word-final (coda) position (e.g. *general* ‘general’) vs. word-initial (onset) position (e.g. *lago* ‘lake’), hypothesizing based on the aforementioned cross-linguistic research that velarization will be favored in word-final contexts over word-initial contexts. Note additionally that no significant differences in lateral velarization were reported between word-medial and word-final coda contexts in Davidson (2012: 331; 2014a: 236-237), in accordance with which we presently do not test for differences between word-final and word-medial laterals (whether in onset or coda positions).

Second, with respect to surrounding segment place of articulation, recall that Davidson (2012a: 335; 2014a: 236-237) found that lateral velarization was favored in contexts of a prior non-front vowel and following velar consonant, paralleling the conditioning of greater velarization for Catalan laterals in the same context (cf. Badia i Margarit 1984: 103-104; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37, 47-48; Wheeler 2005: 34). Since (as discussed above) we investigate /l/ production in word-initial position, which lacks a preceding segment, in order to facilitate the fullest crossing of linguistic factors, we have chosen to examine coarticulation effects with a surrounding vowel and consonant together, rather than examine prior vowel place of articulation separately from following consonant place of articulation. Accordingly, the present study investigates differences in /l/ production in a context of front/non-velar surrounding segments (e.g. *limón* ‘lemon’ ; *túnel tapado* ‘covered tunnel’) vs. a context of velar/non-front surrounding segments (e.g. *lago* ‘lake’ ; *sol*

caliente ‘hot sun’).⁵³ Following the aforementioned research, we hypothesize that lateral velarization will be favored in contexts of surrounding non-front/velar segments over non-velar/front segments.

Third, with respect to word class, this was not a factor incorporated by Davidson (2012; 2014). Relatedly, however, Davidson (2012: 333-334) found an effect of prosodic boundary strength such that lateral velarization was favored in contexts of a determiner + noun. Unfortunately, the data set was highly unbalanced, including a small minority of /l/ tokens in determiners as compared with /l/s in nouns, verbs, and adjectives. Moreover, this effect was contingent upon the context of a following velar consonant, since prosodic boundary effects are theoretically grounded in the notion that across stronger prosodic boundaries, coarticulation effects may be most resisted (with articulatory gestures of the /l/ and the following velar consonant being more likely to realize independently), disfavoring velarization (cf. Byrd & Saltzman 2003). Since the present study incorporates tokens of /l/ in word-initial position and takes considerably more care to maximally cross linguistic factors, we decided to reconsider this sensitivity to prosodic boundaries by focusing on word class. The present investigation examines /l/ production in contexts of closed-class functional category such as a determiner or clitic (e.g. *al garaje* ‘to the garage,’ *la taza* ‘the cup’) vs. an open-class non-functional category such as a noun (e.g. *labios rojos* ‘red lips,’ *control grande* ‘big control’). An effect of word class type, on a theoretical ground, is rooted in a usage-based account of sound change in which frequency effects (i.e., determiners and clitics are of extremely high frequency as compared with open-class category words) are highly influential in conditioning sound change phenomena (Bybee 2002; Pierrehumbert 2001). We therefore hypothesize, following the direction of effect in Davidson (2012), that lateral velarization

⁵³ Note that additional support for the distinction between front vs. non-front vowels (as opposed to front vs. back, which excludes central /a/) is found in Vann (2001: 124), in which CCS lateral velarization is defined specifically with respect /l/ preceded by the vowel /a/.

will be stronger in determiners and clitics than in nouns.

Lastly, with respect to Catalan cognate status, recall that Davidson (2014: 236, 240) found that [ɸ] production (in the most Catalan-dominant bilinguals) was favored in contexts of greater Catalan cognate status. We shall adopt the same treatment of Catalan cognate status in the present study, namely differentiating between Spanish words of greater Catalan cognate status which feature a parallel Catalan (dark) /l/ (e.g. *hotel* ‘hotel;’ Catalan: *hotel*) and Spanish words of lesser Catalan cognate status which lack a parallel Catalan (dark) /l/ (e.g. *papel* ‘paper;’ Catalan: *paper*). Such an effect supports the existence of an interconnected bilingual lexicon in exemplar representation (cf. Brown & Harper 2009; Bybee 2002; 2006; Costa, Santesteban, & Caño 2005; Johnson 1997; Pierrehumbert 2001; 2003). In such a model of lexical representation, the parallel activation of the Catalan cognate *hotel* (critically with the velarized lateral) alongside Spanish *hotel* during production would increase the chance for the phonetic transfer of [ɸ] into Spanish more so than would the parallel activation of a lesser cognate like Catalan *paper* (critically without a velarized lateral) alongside Spanish *papel*. Accordingly, we hypothesize that lateral velarization will be favored in contexts of a greater Catalan cognate over a lesser Catalan cognate. Note that this factor in particular speaks quite transparently to the possible status of CCS [ɸ] as contact-induced, given its direct link to Catalan.

3.1.2. Linguistic Constraints on Barcelonan CCS Intervocalic Fricative Voicing

The present investigation incorporates a set of three linguistic factors as motivated by prior (pilot) research by Davidson (2012b; 2014a; forthcoming), as well as that reported in Serrano Vázquez (1996), Vann (2001), and Wesch (1997). These factors are word position, stress, and word class. We define the levels of each of these factors below, which we note have been adapted from their original use in the aforementioned investigations in order to facilitate the

fullest crossing of factors.

First, with respect to word position, recall that Vann (2001), Wesch (1997), and Vázquez (1996) only offer examples of [z] production in word-final intervocalic position, not mentioning word-initial and word-medial intervocalic contexts. To this end, Davidson (2012b: 28, 45-46; 2014a: 237-240; forthcoming) found a strong effect of word position, such that intervocalic fricative voicing in word-medial contexts was nearly categorically disfavored, evidencing an inhibitory effect accounted for by the presence of a phonemic voicing contrast in this position in Catalan. 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 reported for Madrid Spanish (Torreira & Ernestus 2012: 137-138).⁵⁴ 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.⁵⁵

Second, with regard to stress, recall that Davidson (2012b: 29-30, 45; 2014a: 237-239; forthcoming) found that intervocalic /s/ voicing was favored in contexts of surrounding

⁵⁴ Curiously, however, Hualde & Prieto (2014: 116-119) do indeed report (for Madrid Spanish) that the word-medial condition disfavored intervocalic fricative voicing significantly more than the word-initial and word-final intervocalic contexts, which did not significantly differ in the voicing they conditioned. No explanation of this unexpected lack of difference between word-initial and word-final intervocalic contexts (particularly as compared with the findings reported in Torreira & Ernestus [2012]) was offered. In this dissertation, we may nonetheless explore a three-way distinction between voicing in intervocalic /s/ contexts by comparing the present study’s findings for word-initial and word-final intervocalic contexts with Davidson’s (2012b; 2014a; forthcoming) findings for the word-medial intervocalic context.

⁵⁵ This hypothesis is additionally supported by a parallel effect attested for /s/ aspiration (cf. File-Muriel & Brown 2010: 51), an analogous phenomenon of fricative lenition.

unstressed vowels. In the present study, we have opted to simplify the treatment of syllable stress (which previously was investigated separately as stress type of vowel preceding /s/ and stress type of following vowel) 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 2005: 244; 2014: 251) and allow the speaker to better time articulatory gestures independently of one another (cf. Browman & Goldstein 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. Following Davidson (2012b; 2014a; forthcoming), we predict that intervocalic /s/ voicing will be favored in the context of surrounding unstressed vowels over the context of (at least one) surrounding stressed vowel(s).⁵⁶

Lastly, with respect to word class, this was not a factor incorporated by Davidson (2012b; 2014a; forthcoming). Relatedly, however, Davidson (2012b: 30-31, 45; 2014a: 237-

⁵⁶ This hypothesis is additionally supported by a parallel effect attested for /s/ aspiration (cf. File-Muriel & Brown 2010: 51), an analogous phenomenon of fricative lenition.

238; forthcoming) found an effect of prosodic boundary strength such that intervocalic fricative voicing was (unexpectedly) favored in contexts of a noun/verb + adjective/adverb sequence over a determiner/preposition + noun sequence.⁵⁷ However, as previously discussed for /l/ production, the data set was highly unbalanced, with a minority of /s/ tokens in determiners and prepositions. Accordingly, we have opted to reconsider the study of prosodic boundary strength and analyze /s/ production according to word class type, parallel to the use of this variable for /l/ production. Accordingly, we distinguish between intervocalic /s/ tokens in closed-class functional words such as prepositions and determiners (e.g. *problema sin remedio* ‘problem without a solution,’ *las amigas* ‘the friends’), and intervocalic /s/ tokens in open-class words such as nouns, verbs, and adjectives (e.g. *puertas abiertas* ‘open doors,’ *estaba salado* ‘it was salty’).

It should be acknowledged, however, that in addition to considering attributing any differences in intervocalic /s/ voicing between open-class and closed-class words to their different lexical frequencies, an alternative explanation is proposed in Campos-Astorkiza (2014: 33).⁵⁸ More specifically, since function words in Spanish lack lexical stress (Hualde 2014: 239-240), closed-class /s/ tokens (e.g. sequences of determiner/preposition + noun) constitute a single accentual unit (or stress domain), whereas open-class /s/ tokens (e.g. sequences of noun/verb + adjective/adverb) constitute a double accentual unit (or stress domain). Paralleling the prior discussion of gestural coordination and stress (as it relates to

⁵⁷ Noting that prototypical examples of CCS intervocalic /s/ voicing cited in Serrano Vázquez (1996), Vann (2001), and Wesch (1997) all are in the context of a determiner/preposition + noun, Davidson (2012b: 33; 2014a: 240-241; forthcoming) speculated that this unexpected direction of effect may signify that phrases such as *los amigos* ‘the friends’ are the most salient contexts for intervocalic fricative voicing, and thus are not the context in which [z] production is diffusing. Alternatively, however, it was posited that the result may be simply been an artifact of the unbalanced nature of the data.

⁵⁸ More concretely, Campos-Astorkiza (2014) found, for her Peninsular Spanish data, that voicing assimilation rates of /s/ (to a following consonant) were unexpectedly similar between word-internal /s/ (word boundary absent) and word-final /s/ (word boundary present). She proposed that the similarity was due to the choice of word-final /s/ tokens used. All her word-final /s/ tokens were function words forming a single accentual unit with the consonant-initial noun that followed them. Accordingly, she hypothesized that the lack of differences between word-internal and word-final /s/ voicing assimilation rates was due to the fact that all /s/ tokens constituted single accentual units, and that if /s/ tokens constituting double accentual units were used, voicing assimilation rates would be distinct between the two groups.

segment duration in Spanish), it can be hypothesized open-class /s/ tokens, forming a double accentual unit, better facilitate gestural coordination and thus are expected to be more resistant to intervocalic fricative voicing than closed-class /s/ tokens (with only one lexical stress) (cf. Browman & Goldstein 1989; 1991; Campos-Astorkiza 2014: 33; Hualde 2005: 244; 2014: 251). Accordingly, we hypothesize that intervocalic fricative voicing will be favored in closed-class words over open-class words.⁵⁹

Summarizing the aforementioned linguistic factors studied for /l/ and intervocalic /s/ production in CCS, the influence of syllable position, surrounding segment place of articulation (i.e., coarticulation effects), word class, and cognate effects are investigated for /l/, whereas word position, stress, and word class are investigated for /s/. Whereas word class (for both variables) is not intrinsically linked to either of endogenous motivations or language contact motivations, the other factors can be linked to certain motivations. Syllable position and coarticulation effects for /l/ are both linguistic factors that can evidence cross-linguistic propensities common to many languages. In contrast, a cognate effect for /l/ and a word position effect for /s/, while linguistic in nature (as opposed to extra-linguistic or social), both reflect language-internal structures of Catalan. This leaves the effect of stress (for /s/) as the only linguistic factor that reflects the specific (language-internal) structure of Spanish (a language with duration differences based on prosodic accent). Table 6 is offered below to better visualize these unique motivations, which we will return to as a means of exploring their interplay in the usage patterns of each variant and their distributions throughout the CCS bilingual community.

⁵⁹ This hypothesis is additionally supported by a parallel effect attested for /s/ aspiration (cf. Erker 2012: 148), an analogous phenomenon of fricative reduction.

Table 6: Summary of Kinds of Linguistic Factors Explored for CCS /l/ and Intervocalic /s/ Production

Linguistic Factor	Account Supported (if Effect Found)	Nature of Account Supported
Syllable Position (/l/)	Endogenous	Language Universals
Word Position (/s/)	Contact-induced	Language-Internal: Catalan
Word Class (/l/ & /s/)	N/A	N/A
Coarticulation (/l/)	Endogenous	Language Universals
Cognate Status (/l/)	Contact-induced	Language-Internal: Catalan
Stress (/s/)	Endogenous	Language-Internal: Spanish

3.2. Social Factors Considered for Barcelonan CCS /l/ and Intervocalic /s/ Production

3.2.1. Social Factors Varying Across Speakers

In the present section, we review the following four social factors explored for this study: gender, age, Catalan use, and Catalan exposure. Note that for all four factors, a socio-demographic questionnaire (adapted from Simonet (2008) and Pieras (1999), detailed in section 3.3.1) is used to confirm that participants meet the specified social criteria.

The first social factor examined in this dissertation is gender, chosen due to its proven useful role in assessing cases of linguistic change and innovation. We reference the Labovian *gender paradox*, or the notion that “women conform more closely than men to sociolinguistic norms that are overtly prescribed but conform less than men when they are not” (Labov 2001: 293; additionally, Chambers 2004: 352). This focus on the linguistic behavior of women in comparison to men reflects the widely-accepted notion that “women are the principal innovators in the process of change” (Labov 2001: 294). By comparing the production of /l/ and /s/ of women to that of men, we aim to offer insight as to the possibility

for a linguistic change in progress in Catalanian CCS, as well as to potential differences in the social values afforded to each of [t] and [z].

The second social factor examined in this dissertation is age, due to its well-established and crucial role in assessing generational change within an *apparent time construct* (cf. Bailey 2004; Bailey et al. 1991; Chambers 2004: 355-364; Sankoff & Blondeau 2007). This construct, developed in the early 1960's, is a frequently used technique for assessing diachronic language change in which differences in language use by older and younger speakers are compared at a single point in time, permitting the researcher to make inferences about prior states of language use (Tagliamonte 2012: 43). Paralleling Simonet (2008: 106), two age groups were established in order to reflect two generations of language users. The younger age group was comprised of speakers ages 18 to 30 born in the 1980s and early 1990s, whereas the older age group was comprised to speakers ages 48-60 born in the 1950s and early 1960s. Although Davidson (2012a; 2012b) grouped speakers using age ranges of 18-23 and 25-45 in order to ensure that all participants would have received public pre-university education in Catalan (i.e., educated after the Franco Dictatorship from 1939-1975), we have decided to refine these age groups (distancing them in age) to better reflect generational language change.

The third social factor examined in this dissertation is Catalan use, selected for its crucial role in establishing a construct of language dominance in order to best investigate contact with Catalan as a motivation behind CCS language trends (cf. Davidson 2012a; 2012b; 2014a; forthcoming; Pieras 1999; Simonet 2008; 2010a). Language use was operationalized using a series of language indicators (following Davidson [2012a: 326; 2012b: 13, 36; 2014a: 228; forthcoming], Pieras [1999: 215-216], and Simonet [2008: 104; 2010a: 666]), including:

- Language self-reported as being speaker's native language;

- Language self-reported as principally used at home while growing up;
- Language self-reported as used with each parent;
- Self-reported preference for the use of Spanish or Catalan in general;
- Self-reported linguistic competence (reading, writing, speaking, understanding) in Spanish and Catalan;
- Language self-reported as principally being used with friends in elementary school;
- Language self-reported as principally being used with friends in high school school;
- Self-reported estimate of daily (habitual) language use with family members;
- Self-reported estimate of daily (habitual) language use with friends;
- Self-reported estimate of daily (habitual) language use with work/school colleagues;
- Self-reported estimate of daily (habitual) language use when shopping;
- Self-reported estimate of daily (habitual) language use with strangers;
- Self-reported estimate of daily (habitual) language use with 5 closest friends;
- Self-reported estimate of daily (habitual) language use with 5 closest work/school colleagues.

The fourth social factor examined in this dissertation is exposure to Catalan (or more generally, language input), selected for its crucial role in establishing a construct of language dominance in order to best investigate contact with Catalan as a motivation behind CCS language trends (cf. Davidson 2012a; 2012b; 2014a; forthcoming; Pieras 1999). Following Davidson (2012a; 2012b; 2014a; forthcoming), Catalan exposure was operationalized across two dimensions: community-wide input, or the horizontal effects of being exposed to Catalan by virtue of living and interacting with one's community, and trans-generational input, or vertical effects of exposure to Catalan and/or Catalan features (via Catalan and/or CCS) in the household from one's parents.

The first kind of input, community-wide input, relates to the overall presence of Catalan (or lack of presence of Spanish) in the community in which the speaker was raised. Following Davidson (2012a; 2012b; 2014a; forthcoming), we have chosen to examine this

factor by distinguishing two groups of speakers within the Barcelonan Metropolitan Area (BMA): those born and raised within the urban capital city of Barcelona, and those born and raised in smaller towns on the outskirts of the BMA. As discussed previously in 1.3.2, the city of Barcelona is renowned for toting the greatest presence of Spanish speakers in all of Catalonia (Lleó et al. 2008: 186), reflected in census polls indicating comparatively lower numbers of L1-Catalan speakers, lesser degrees of Catalan competence, and lower levels of Catalan habitual language use than in smaller counties and towns outside the urban capital (Institut d'Estadística de Catalunya 2011). Comparative figures for Barcelona (city) and three smaller towns on the outskirts of the BMA (connected by railways to the capital, approximately 1 hour away) are provided below in table 7.⁶⁰ The three towns described below were chosen due to their small population size and greater prevalence of Catalan compared with the city of Barcelona.

Table 7: 2011 Population (%) Ages 2+ in Four BMA Cities with Competence in Catalan

	Barcelona (city)	Sant Miquel de Balenyà / Seva	Centelles	Arenys de Munt
Population Size (speakers)	1,573,318	6,970	7,136	8,153
% of Population that Understands Catalan	95.42	98.57	98.32	99.77
% of Population that Speaks Catalan	72.32	87.53	86.71	88.74
% of Population that Reads Catalan	79.23	88.29	87.70	88.83
% of Population that Writes Catalan	53.08	67.99	70.89	69.67

Source: Institut d'Estadística de Catalunya 2011

Regarding the second kind of input, trans-generational input, we refer to the Spanish variety spoken by the parents of each speaker (i.e., MS or CCS, based on whether or not the parents acquired Spanish in Catalonia or in a monolingual region of Spain), precisely because it is

⁶⁰ Though it would be ideal to compare the percentages of L1-Catalan speakers and habitual users of Catalan across these four cities, unfortunately, the only census data available for these three smaller towns is language competence data.

plausible to expect differences in Catalan-Spanish transfer effects based on whether the Spanish input received by a child is native-like or not. Flege (2007: 363) succinctly describes this effect: “Individuals who are exposed only to native-speaker models are likely to have a better L2 pronunciation of the L2 than individuals who have received a substantial amount of foreign-accented input.” In this sense, children raised in homes with two parents of Catalanian origin may be more likely to use CCS features (e.g. [ɸ] and intervocalic [z]) than children whose parents’ Spanish lacks these CCS features. Davidson (2012a: 330-331; 2012b: 23-24) found that lateral velarization and intervocalic /s/ voicing were stronger in speakers whose parents were born in Catalonia (independent of the language used while growing up). Similarly, in Pieras (1999: 235), one speaker classified as Spanish-dominant based on language use exhibited considerably more CCS features than other Spanish-dominant speakers and in fact was precisely the speaker whose parents, although having used only Spanish with him while growing up, were Catalan-dominant speakers, suggestive of the fact that the Spanish input he received while growing up was not MS, but rather CCS. It should be noted that trans-generational input is controlled in this dissertation, not varying across the other social factors previously discussed. Further information on this decision, in addition to other controlled social factors, is provided in the following section. Moreover, it should be noted that a control group of monolingual Spanish speakers from Madrid (ages 18-30) was included so as to facilitate comparisons across a contact and non-contact variety of Spanish. The full breakdown of social groups created by crossing gender, age, Catalan use, and Catalan exposure appears in the following subsection. Note that of these social (or extralinguistic) factors for CCS /l/ and /s/ production, the only factors intrinsically linked to either endogenous or contact-induced accounts are Catalan use and exposure to Catalan. Both factors, if found to significantly condition CCS /l/ and /s/ production, directly relate to the influence of Catalan on Spanish, suggesting contact-induced innovation.

3.2.2. Controlled Social Factors Not Varying Across Speakers

Three social factors were controlled for across subjects so as to facilitate the fullest crossing of social factors and additionally limit the total number of participants needed for ample representation according to each social factor. The first controlled social factor alluded to in the previous section is trans-generational input (i.e., parent Spanish variety), which pertains to the overall exposure to CCS or Catalan features a subject has had while growing up. The reason this social factor was not fully manipulated across the other social factor conditions was that Davidson's (2012a; 2012b; 2014a; forthcoming) Barcelonan CCS data, there was not an abundance of speakers dominant in Catalan or Spanish whose parents' Spanish was respectively acquired in a monolingual Spanish region or Catalonia (i.e., parents born in Catalonia often spoke Catalan to their children who in turn were identified as Catalan-dominant, whereas parents not born in Catalonia often spoke Spanish to their children who in turn were identified as Spanish-dominant). Accordingly, participants in the present investigation that are identified as Catalan-dominant (particularly via Catalan language use) come from households of Catalanian parents, whereas participants identified as Spanish-dominant (particularly via Spanish language use) come from households of non-Catalonian parents. The pairing of language use and trans-generational input ensures that speakers classified as having been raised in either a Catalan- or Spanish-speaking household will have all received exposure to native-like trans-generational input in either Catalan or Spanish.

The second controlled social factor is that of social class. Subjects' social class was assessed as a factor of their occupation and/or their parents' occupations (cf. Pieras 1999), and only speakers of the middle social class were targeted for this study. Following Pieras (1999: 121, 281), middle class occupations include paid positions as company employees, clerks, managers, shopkeepers, and similar jobs that are lesser paying than those of government officials, advanced degree positions (i.e., lawyer, doctor, architect), or middle to

large scale business owners. The decision to seek out participants of middle social class is motivated by Labovian principles of language change (cf. Labov 2001), namely that in cases of linguistic change from above, the middle social class often shows instances of exaggerated linguistic innovation extending beyond the norms of the higher social class, while in cases of linguistic changes from below, change is believed to originate within a central social group within the interior of the socioeconomic hierarchy (Labov 2001: 188, 275). In sum, the linguistic behavior of members of the middle social class can often reveal valuable insights in situations of language change (in that the most advanced stages of change are evidenced often in the speech of this social class), and we accordingly focus on members of this dynamic social group for the present study.

The third controlled social factor is that of attitude toward Catalan, which has been found to correlate with exposure to Catalan. For example, Vila-Pujol (2007: 65-66) reported that with higher levels of Catalan exposure, one's attitude toward Catalan (including one's consideration of having a Catalanian identity) is more favorable. Similarly, Vann (1999b: 200-201) reported that increased exposure to Catalan through pre-university education correlates with higher esteem for the Catalan language. Since we seek to compare patterns of CCS language use between individuals of differing levels of Catalan exposure and use, we have decided (echoing Davidson [2012a; 2012b; 2014a; forthcoming]) to verify that all participants minimally do not harbor negative attitudes toward the Catalan language. Though more details on how these attitudes were collected using a socio-demographic questionnaire are offered below in section 3.3.1, it should be noted that just as was the case for the participants in Davidson (2012a; 2012b; 2014a; forthcoming), no participants in the present investigation exhibited negative opinions toward the Catalan language (which makes differences in opinions toward CCS [ɫ] and intervocalic [z], as well as Catalanized Spanish in general all the more intriguing!).

3.2.3. Sampling and Participant Selection

The sampling strategy employed for data collection, namely stratified random sampling (also known as judgment sampling),⁶¹ is one of various sampling strategies frequently utilized in sociolinguistic investigations and dates back to the mid 1970's (cf. Payne 1976; Trudgill 1974; Sankoff and Sankoff 1973, among others). It was developed in response to general difficulties with employing strictly random sampling, such as, for example, finding sufficient subjects belonging to a subset of the general population that are "...geographically and socially distributed amongst the population in a non-random way" (Milroy 1987b: 24, as cited in Tagliamonte 2006: 22). Stratified random sampling involves the selection of specific social criteria (i.e., independent variables that are social in nature, such as gender) on the part of the researcher before subject recruitment begins, and the subsequent seeking out of as many subjects as possible in order to obtain ample representation⁶² for the social criteria in question (Tagliamonte 2006: 23).

The combination of four manipulated social factors (gender - 2 groups; age - 2 groups; Catalan use - 2 groups; Catalan exposure - 2 groups) yields a total of 16 unique participant group cells. However, since subjects hailing from smaller, Catalan-prevalent towns outside of the city of Barcelona are not Spanish language users, the actual number of participant group cells that can be easily filled is 12 (i.e., 3 groups based on the combination of language use and exposure x 2 genders x 2 ages). Accordingly, the minimum number of subjects per cell is 3-5, yielding 36-60 Catalan-Spanish bilingual subjects in total. Regarding the premise that speech data collected from speakers will be analyzed as representative of the speech communities their social criteria portray, we clarify the notion of representativeness as currently understood and used in sociolinguistics. This notion has been crucially adapted

⁶¹ In Spanish, stratified random sampling is known as *muestreo intencional* or *muestreo de selección intencionada* (respectively in Moreno Fernández [2009: 312-313] and Silva-Corvalán [2001: 51]).

⁶² Statisticians have posited that 3-5 subjects per cell can be enough to warrant valid inferences regarding the populations they are selected to represent (Moreno Fernández 2009: 312; Tagliamonte 2006: 31).

toward the study of variation as representing possible language change, and thus demands “...not that the sample be a miniature version of the population, but only that we have the possibility of making inferences about the population based on the sample” (Sankoff 1988: 900). This understanding runs parallel with a crucial finding within sociolinguistic research, namely that “...ongoing work in sociolinguistics [has] found that relatively small samples - samples too small to be technically representative - were sufficient to account for language variation in large cities” (Tagliamonte 2006: 23). Accordingly, by following the aforementioned method of stratified random sampling in order to obtain minimally 3-5 subjects per cell, we strove to obtain a sample valid for a sociolinguistic study interested in language variation and change.

In order to find participants, the researcher posted a series of flyers in public venues in Barcelona and the aforementioned smaller towns on the outskirts of the BMA. Additionally, the researcher sent out e-mail versions of the flyers using student e-mail directories from the *Universitat de Barcelona*, *Universitat Pompeu Fabra*, and *Universitat Autònoma de Barcelona*. In all cases, the solicitation of participation was made to Catalan-Spanish bilingual speakers with whom the researcher had never had prior contact. With respect to participant recruitment in Madrid, flyers were similarly posted around the *Universidad Autónoma de Madrid*, and an e-mail version of the flyer was sent to a post-doctoral researcher (a friend of the researcher) who offered to forward it to fellow colleagues (who could then forward it to their students). All participants were offered 15 euros for their successful completion of the experiment.

In the end, data from a total of 48⁶³ residents of the BMA (16 from smaller villages on the BMA outskirts and 32 from the city of Barcelona) were collected in accordance with the

⁶³ As a consequence of time restrictions (for data analysis), problems with recording quality in certain recording spaces, and the balancing of numbers within social groups, the total number of BMA informants (144) was reduced to the present 48. Similarly, the total number of Madrid informants (27) was reduced to the present 6.

aforementioned 12 social factor cells, in addition to 6 monolingual speakers from Madrid.

Table 8, shown below, illustrates the social groups represented by these speakers.

Table 8: Speaker Counts According to Relevant Social Categories

Group	Group Code	Younger (18-30) / Older (48-60)	Home Language / Native Language / Parent Native Language	Daily Spanish Use (at home, with friends, at work/school, shopping)	Community-wide Exposure to Catalan
Madrid (Spanish monolingual control)	D	6	Spanish	100% SD = 0	None
Barcelona - Higher Spanish Dominance	C	10 / 6	Spanish	77% SD = 10.8	Lesser
Barcelona - Higher Catalan Dominance	B	10 / 6	Catalan	10% SD = 6.9	Lesser
Village - Higher Catalan Dominance	A	10 / 6	Catalan	7% SD = 5.8	Greater

Note: Gender (male vs. female) was balanced for all cells

3.3. Selection and Design of Test Instruments for each Variable

In the present section, we detail the use of six test instruments incorporated into the present study, which elicits experimental (and formal), semi-spontaneous (and casual), and perceptual (overt and covert) speech data. The six test instruments include: (1) a socio-demographic questionnaire designed to gather information on relevant social characteristics of the participants, (2) a Spanish elicited production task designed to elicit formal or careful (experimental) Spanish speech, (3) a Catalan elicited production task designed to elicit formal or careful (experimental) Catalan speech, (4) a sociolinguistic interview designed to elicit natural (semi-spontaneous) Spanish speech, (5) a matched guise task designed to elicit

covert perceptual speech data, and lastly (6) a debriefing interview designed to elicit overt explicit attitudes on CCS speech and CCS phonetic variants.

3.3.1. Socio-Demographic Questionnaire

The socio-demographic questionnaire used in this investigation, appearing as appendix A, contains 22 questions and was used to screen participants according to the social criteria outlined previously in section 3.2. It was adapted from the socio-demographic questionnaire used in Pieras (1999) and incorporates some questions related to language use from the questionnaire used in Simonet (2008). The first 8 questions pertain strictly to socio-demographic characteristics of the participant and his/her family, whereas the remaining portion of the questionnaire pertains to language use and exposure (questions 9-17 and 20-21), language competence (questions 18-19), and language attitudes (question 22).

The final (22nd) question consists of a brief survey designed to elicit general attitudes toward the Catalan language and culture. It contains 10 statements to which subjects respond on a 5-point scale ranging from “strongly agree” to “strongly disagree,” with “neither agree nor disagree” as a mid-point. The rating scale and statements are based off of a similar survey in Pieras (1999) and Vann (2007). For example, the first statement reads “Catalan can coexist with Spanish in Catalonia.” Responses of “strongly agree” or “agree” signify positive dispositions toward Catalan for half of the items (such as the aforementioned first item), whereas responses of “strongly disagree” or “disagree” demonstrate positive dispositions toward Catalan for the other half. These two types of statements alternate one after the other. Participants for whom no fewer than 8 of the 10 items displayed at least neutral (the mid-point '3' value) or more positive dispositions toward Catalan were considered to not harbor

negative attitudes toward Catalan, which in fact was the case for every participant.⁶⁴

3.3.2. Careful Speech Oral Elicitation Task in Spanish

The second test instrument employed in this investigation is a Spanish elicited production task (formal recorded reading), appearing as appendix B. Participants were asked to read aloud a series of 166 phrases (80 target items of /l/ alternating with 80 target items of intervocalic /s/, whereby each target type serves as a filler for the other, and 6 additional /l/ items used strictly for acoustic normalization purposes explained in section 3.5.1) that are maximally crossed and balanced in number (5 or 10 items per cell⁶⁵) for the aforementioned linguistic factors for /l/ and /s/ described previously in sections 3.1.1 and 3.1.2.

With respect to the 80 intervocalic /s/ tokens, it should be noted that all are surrounded by two low central /a/ vowels with the sole exception of target /s/ items that incorporate the unstressed prepositions *sin* ‘without’ and *sobre* ‘on,’ whose intervocalic /s/ segments are adjacent to only one /a/ vowel. The motivation to minimally vary the quality of vowel surrounding /s/ tokens stems from a related /s/-lenition study by File-Muriel & Brown (2011) that found a significant effect of surrounding vowel height on the lenition of /s/ to [h] and [∅]. The selection of /a/ as the vowel to most often surround /s/ stems from Quilis (1981: 235), who notes that of all the Spanish vowels, /a/ is the one that exerts the least influence on the frequency (higher or lower) of the energy produced during an /s/ segment.

With respect to the total of 86 /l/ tokens used in this task, 9 of them (underlined in appendix B) were incorporated directly from Simonet (2008: 264; 2010a: 667). These 9

⁶⁴ This is not terribly surprising in light of the aforementioned census data on attitudes toward bilingualism and the prevalence of linguistic cosmopolitanism (Newman 2011; Newman et al. 2008; Trenchs-Parera & Newman 2009) detailed previously in section 1.3.3.

⁶⁵ The three linguistic factors analyzed for intervocalic fricatives were perfectly crossable, allowing for precisely 10 /s/ items per cell (8 cells total [2 levels ^ 3 factors]). For lateral velarization, however, Catalan cognate status and word class were not fully crossable, since all closed class words were greater Catalan cognates. Accordingly, these two factors were combined into a single factor (Catalan cognate status / word class) with three levels (greater cognate / open class, lesser cognate / open class, and greater cognate / closed class). All closed class cells (4 total) contained precisely 10 items, whereas all open class cells (8 total) contained precisely 5 items.

Spanish /l/ items (only 3 of which are counted as part of the aforementioned total 80 target /l/ items because they are able to be fully coded using all /l/ linguistic factors) were included in this study because they lend themselves to a controlled analysis of /a/, /i/, and /u/ segments, which is necessary for the acoustic normalization process applied to laterals (detailed in section 3.5.1). Their inclusion in Simonet (2008; 2010a) similarly facilitated this normalization process.

The speech style elicited from the use of this Spanish oral word-list task is careful (or formal), as the instructions for completing this task include the request that subjects read these words as naturally as possible, while still using their best Spanish pronunciation possible. The decision to elicit formal speech as opposed to less careful, spontaneous speech is motivated by our principal interest in using an oral word-list task, a frequently employed production task that affords the researcher with an extremely high level of control over the linguistic contexts in which /l/ and intervocalic /s/ are produced across all subjects (Moreno Fernández 2009: 314). By selecting each target phrase according to the linguistic factor contexts previously discussed in sections 3.1.1 and 3.1.2, we better ensure that a balanced number of tokens across each set of linguistic factor contexts be produced across all participants. It is important to recognize that while the data elicited from an oral word-list task are not directly comparable with natural spontaneous speech, these data nevertheless reveal interesting and valid insights as to the kinds of variants produced in a formal speech style, which is particularly relevant when trying to assess levels of prestige or stigma associated with linguistic variants. Since stigmatized and/or non-standard linguistic variants are usually avoided in contexts of formal speech (Moreno Fernández 2009: 101; Tagliamonte 2012: 34), the oral word-list task is an especially conservative task in that non-standard (high) degrees of lateral velarization and intervocalic /s/ voicing are expected to be less frequent. As such, instances of particularly velarized /l/ and voiced intervocalic /s/ recorded

during this formal task will all the more strongly suggest that these are frequent CCS phenomena, likely even more widespread in natural, spontaneous speech.

3.3.3. Careful Speech Oral Elicitation Task in Catalan

The only portion of this experiment that incorporates Catalan speech data is an elicited production task (formal recorded reading). This third test instrument, appearing as appendix C, consists of a series of 18 Catalan phrases which alternate between 9 /l/ and 9 intervocalic alveolar fricative items canonically realized as [z] (i.e., some feature word-initial or word-medial voiced /z/, while others feature word-final prevocalic /S/). Participants read the 18 phrases twice, providing a total of 18 /l/ and 18 intervocalic alveolar fricative tokens. Note that the 9 Catalan /l/ stimuli share the same linguistic contexts as (and for the most part are direct translations of) the aforementioned 9 Spanish /l/ stimuli incorporated from Simonet (2008: 264; 2010a: 667). The purpose of this instrument is to examine whether or not all Catalan-Spanish bilinguals use [ɫ] and intervocalic [z] when speaking in Catalan. Since our analysis of CCS /l/ and /s/ production invokes the concept of language transfer from Catalan, we believe it prudent to confirm that subjects' Catalan speech indeed incorporates [ɫ] and intervocalic [z] as claimed by the aforementioned dialectal descriptions of Catalan in sections 3.1.1 and 3.1.2.⁶⁶

3.3.4. Sociolinguistic Interview

The fourth test instrument is a sociolinguistic interview (cf. Labov 1984; Moreno Fernández 2009: 313-314; Tagliamonte 2006: 37-49), lasting 15 to 20 minutes, designed to elicit more casual, semi-spontaneous CCS speech that will be more informative as to /l/ and intervocalic

⁶⁶ There is likely sociolinguistic variation in [ɫ] and intervocalic [z] production in Catalan not addressed in traditional dialectal descriptions of Catalan. For example, Julià i Muné (2008: 74) notes the emergence of a recent upper class, arrogant Catalan speech style (or acrolect) that uses a clear, non-velarized [l] category in place of [ɫ].

/s/ production in natural speech. Casual interview modules appear as appendix D. The researcher discussed colloquial topics with each participant, such as their daily routine, hobbies, food preferences, etc. The goal was to elicit as much casual speech data as possible from each participant. Additionally, participants were asked to describe a set of 6 images (such as a castle surrounded by forest, a hotel breakfast, and a tropical island) in order to obtain a set of speech data that would be maximally comparable (in terms of content and select words with /l/ and intervocalic /s/) across all participants. Aside from being used to elicit speech that better resembles natural spontaneous speech than that which is obtained from the aforementioned careful phrase reading, this task is included specifically so that it may be compared to formal speech under the expectation that non-standard speech variants will be more frequent in more casual speech styles (cf. Moreno Fernández 2009: 101; Tagliamonte 2012: 34).⁶⁷ Note that all interviews were conducted exclusively by the researcher.

3.3.5. Matched Guise

In order to indirectly elicit social evaluations of [ɫ] and intervocalic [z] production in Barcelonan CCS, we designed and implemented a matched guise experiment. The matched guise technique, originally developed for psychology research by Lambert and colleagues in the 1960s (cf. Lambert 1967; Lambert, Hodgson, Gardner, & Fillenbaum 1960; see also Campbell-Kibler 2006: 55 for additional references), is a frequent sociolinguistic instrument that was designed to “investigate people’s attitudes toward social, geographical or ethnic language varieties and to the different languages spoken in bilingual communities” (Stefanowitsch 2005: 1; see also Gaies & Beebe 1991: 157). The matched guise technique, in

⁶⁷ Moreover, this comparison will provide empirical data to shed light on the aforementioned (see section 2.1.4) comments of some Catalan-Spanish bilinguals regarding the need to correct their pronunciation when speaking in public (i.e., more carefully) (cf. Sinner 2002: 166).

its most basic form, consists of the recording of an individual that produces a single set of speech data in two or more guises, be they languages or language varieties. The speech guises produced, since they are from the same speaker, are optimally controlled for differences in paralinguistic cues such as speech rate, pitch contours, or aspects of voice quality, and additionally length and speech content. By playing these guises (separated by a series of fillers, or speech from other speakers) for listeners and asking them to evaluate the speaker on personal qualities such as intelligence, likeability, social class, etc., differences in evaluations between the two guises (which listeners assume were produced by two unique speakers) are assumed to be attributed to listeners' personal attitudes toward the language varieties or languages used (Campbell-Kibler 2006: 61; Stefanowitsch 2005: 1).

The advantage of using this indirect method to elicit language attitudes as opposed to more direct methods (such as overt questions regarding participants' opinions of a certain language or linguistic feature)⁶⁸ lies in that by shifting participants' focus away from language itself, this affords the participant with a "higher degree of introspection and privacy," resulting in more "spontaneous and sincere responses" (Solís Obiols 2002: 2). More direct methods, on the other hand, are plagued with methodological complications including "possible ambiguity in the formulation of direct and indirect questions" (Solís Obiols 2002: 2) and "a high likelihood that answers will reflect conscious stereotypes prevalent in their community rather than actual attitudes" (Stefanowitsch 2005: 1). The matched guise technique has been incorporated as a frequently used tool for not only sociolinguistic research concerning linguistic attitudes in Catalonia (cf. Newman 2011 and references within), but also (and more generally) social psychological and educational issues (for example, effects of speaker gender on comprehension, recall, or evaluation, and attitudes toward non-native learners of second languages) (cf. Gaies & Beebes 1991: 158 and

⁶⁸ One may reference Campbell-Kibler (2006: 58-59) for an extensive list of past research using overt linguistic attitude questions.

references within).

In the present dissertation, the matched guise used constitutes an extension of a phonetically-driven matched guise in Campbell-Kibler (2006) that focused on attitudes associated with the velar or alveolar realizations of the variable (ING). In the following subsections, we detail the methodology used to design the matched guise for Barcelonan CCS /l/ and intervocalic /s/ production.

3.3.5.1. Selecting Speech Stimuli

The first decision to be made regarding the speech in the matched guise was whether to record spontaneous speech (see Campbell-Kibler [2006: 83] for a list of matched guise research incorporating spontaneous speech) or record speech read from a text designed by the researcher as is traditionally done in matched guise research. The former option avoids confounds of read vs. natural speech (pertaining to discernable differences in prosody, speech rate, length and placement of pauses [Campbell-Kibler 2006: 83]), whereas the latter option allows the researcher to have substantially greater control over the contexts in which linguistic variables occur, eliminate differences in word-choice and passage length between guises, and incorporate neutral, non-biased speech content. We have chosen the latter option as motivated by our principal interest in discerning attitudes associated with each of CCS /l/ and intervocalic /s/ production separately (rather than assess overall attitudes with CCS speech vs. monolingual Spanish speech, as was performed by Sanz i Alcalà [1991], for example). Control over the speech materials allowed the meticulous creation of two reading passages, one incorporating /l/ without a single instance of intervocalic /s/, and another incorporating intervocalic /s/ without a single instance of /l/. In this way, we are able to discern linguistic attitudes associated with /l/ from intervocalic /s/, which will allow us to draw clearer insights as to our research questions regarding the usage and potential diffusion

of [ɸ] and [z] as variants of two distinct linguistic variables.

The two reading passages, appearing as appendix E, each feature exactly 10 instances of /l/ or intervocalic /s/ as part of a text of 80 and 78 words respectively, and exhibit /l/ or intervocalic /s/ respectively as 3.0% and 3.2% of their total phonemes. The texts, when read aloud, last approximately 29 and 28 seconds. Regarding the passages' length and the number of linguistic variable occurrences (10) in each passage, we note that (ING) tokens in Campbell-Kibler (2006: 87) appeared from 2-6 times in passages of approximately 10 to 20 seconds in length. Our slightly longer passages reflect manuals of matched guise design that suggest passages of 2 minutes (cf. Solís Obiols 2002: 3); since each of the /l/ and intervocalic /s/ passages is heard twice, once with [ɸ] or intervocalic [z] and once with [l] or intervocalic [s], this amounts to approximately 2 minutes of speech stimulus.

Though both /l/ and intervocalic /s/ appear in various linguistic contexts, the majority correspond to those found to favor lateral velarization and intervocalic fricative voicing in Davidson (2012a; 2012b; 2014a; forthcoming). To this end, all 10 words with /l/ have Catalan cognates with a parallel /l/, the majority of /l/s feature a prior non-front vowel and appear word-finally, and half feature a following velar consonant or pause. As for the intervocalic /s/ passage, all 10 intervocalic /s/ tokens appear in word-final position and the majority appear between one or two unstressed vowels. The decision to offer /l/ and intervocalic /s/ in an assortment of linguistic contexts, rather than focus exclusively on a single context that has been suggested to favor either feature, was motivated by a desire to both avoid any salient alliteration effects and to better approximate natural speech data, in which /l/ and intervocalic /s/ appear in a wide assortment of linguistic contexts.

3.3.5.2. Collecting Unmanipulated Speech Stimuli

The aforementioned /l/ and intervocalic /s/ passages were spoken by a Catalan-Spanish

bilingual female (born and raised in the BMA) and recorded in an audiometric soundproof booth in the UIUC Phonetics Lab. Since two linguistic variables (/l/ and intervocalic /s/) were being considered, a single speaker acted as the guise in order to minimize any voice differences between the two passages. The motivation for selecting a female speaker stemmed from the results of Davidson (2012a; 2012b), which suggested that youth female CCS speakers were particularly dynamic in /l/ and intervocalic /s/ production as compared with men. The guise, a Catalan-Spanish bilingual speaker in her 20's, was a graduate student in Hispanic Linguistics at the time of recording and was (metalinguistically) aware of differences between CCS and monolingual Spanish speech. She was specifically chosen to act as the guise because of her ability to consciously monitor her Spanish speech in terms of these features. That is, this speaker natively produces Catalan [ɫ] and intervocalic [z] and is able to self-monitor her (carefully) read speech to best approximate monolingual Spanish. Note that although the guise's most careful Spanish speech still exhibits some CCS features (not pertaining to /l/ or intervocalic /s/, such as vowels and intonation), attitudes regarding /l/ and intervocalic /s/ production are observable based on the differences in evaluation of passages that are identical save /l/ and intervocalic /s/ production. In other words, even if the /l/ passage, for example, exhibits traces of a detectable Catalan intonation, it is crucially differences in ratings between the same passage with [l] vs. [ɫ] that evidence attitudes toward /l/ production.

The guise was instructed to read each Spanish passage at a natural pace, with careful monolingual-like pronunciation. The goal was to obtain template passages of /l/ and intervocalic /s/ that, ignoring these two features, showed as few (if any) features of CCS speech as naturally possible. These templates (one for /l/ and one for intervocalic /s/) would then serve as the base onto which to digitally splice prototype categories of clear [l], dark [ɫ], voiceless [s], and voiced [z] (i.e., creating “minimal pairs of recordings” differing only be

velarization and voicing degrees [Campbell-Kibler 2006: 87]). After several careful readings of the /l/ and intervocalic /s/ passages, which were later inspected by the researcher in order to identify (and splice out) [l] and [s] variants, the guise was instructed to read each passage several times more using CCS speech. The researcher later inspected these CCS readings in order to identify (and splice out) [ɫ] and [z] variants. After the recording session, the researcher was left with several renditions of the /l/ and intervocalic /s/ passages in modes of careful Spanish and CCS.

3.3.5.3. Synthesizing Speech Stimuli

The first step in synthesizing speech stimuli from the recordings collected from the guise was to create a template passage of /l/ and intervocalic /s/. To do so, the careful Spanish renditions of the /l/ and intervocalic /s/ passages were acoustically analyzed in Praat. Since the guise was reading carefully, not all portions of each passage sounded sufficiently natural (i.e., there were certain disfluencies such as pauses and the restarting of sentences that were produced with a speech error). Moreover, on occasion certain phonetic CCS features (principally vowel quality) were present. Accordingly, the researcher first identified, on a sentence-by-sentence basis, the best (or most natural and monolingual-like in quality [ignoring /l/ and intervocalic /s/ production]) candidates for use in the experiment. Care was taken in the selection of sentences to ensure that the pitch contours across sentences did not saliently deviate from natural-sounding speech (and pitch accents were thus not manipulated). The researcher manually adjusted pauses between sentences in order to create a natural-sounding flow throughout the passage (this was accomplished by either copying and pasting in pauses from other sections of the passage, or reducing pause length with the *cut* feature).

Once the /l/ and intervocalic /s/ passages were assembled, their intensity was adjusted to 60 decibels to equalize volume across each passage (accomplished by using the *modify* >

scale intensity feature). Lastly, each passage (in full) was sped up by a factor of 1.1 in order to better mimic naturally flowing speech, since the careful readings sounded somewhat slow (accomplished by manually inserting a duration point at a factor of 1.1 at the start and end of each passage using the *to manipulation > edit* feature). At the end of this stage, a maximally monolingual-like (aside from /l/ and intervocalic /s/ production) rendition of each of the /l/ and intervocalic /s/ passages, with natural-sounding inter-sentential pauses, stable volume, natural-sounding speed, and natural-sounding pitch contours, was obtained.

The second step of guise synthesis entailed the splicing out of clear [l]s, dark [ɫ]s, voiceless[s]s, and voiced [z]s from the recorded materials. Following Campbell-Kibler (2006: 88-91), we sought to first identify these variants in each of the 20 total contexts (i.e., 10 /l/s from /l/ passage renditions and 10 intervocalic /s/s from intervocalic /s/ passage renditions), and subsequently alter them in terms of pitch, duration, and intensity in order to match the /l/ or intervocalic /s/ onto which they would be spliced in the template passages. As the processes of splicing /l/s and /s/s were rather different, we detail each below separately.

In order to splice out tokens of [l] and [ɫ] from the various recorded renditions of the /l/ passage, it was first necessary to establish a means for discretely distinguishing light laterals from dark laterals. As previously discussed in section 2.1.1, several authors advocate for the treatment of lateral velarization (particularly in Spanish and Catalan) as a gradient phenomenon without categorical boundaries between light and dark laterals (cf. Recasens 1996; 2004; 2012; 2014b; Recasens & Espinosa 2005; Recasens et al. 1995; Simonet 2010a; Simonet 2010b). Nonetheless, categorical thresholds (reported more commonly as typical or common velarization degrees) for [l] and [ɫ] are rather common in the literature, likely reflective of a speaker's categorical (and cross-linguistic) perception of a given as lateral as

either clear or dark (cf. Proctor 2009: 62).⁶⁹ By far the most common threshold reported (calculated from Central Catalan and Spanish laterals) is that of approximately 1500hz, such that the second formant frequency (F2) of [ɫ] is below 1500hz, whereas the F2 of [l] is above 1500hz (Martínez Celdrán & Fernández Planas 2007: 136; Quilis 1981: 276; Recasens 1986: 95, 102; 1996: 65; 2004: 600; 2014b: 178; Recasens & Espinosa 2005: 3, 6; Recasens et al. 1995: 42). Other characterizations of light and dark laterals in Catalan and Spanish don't stray particularly far from this 1500hz threshold. For instance, Pieras (1999: 220) and Recasens (1991: 306; 2012: 369) both characterize [l] as exhibiting an F2 of at least 1500hz, whereas [ɫ] typically exhibits an F2 of roughly 1000 to 1200hz. These F2 boundaries were in fact found to very accurately reflect the Spanish laterals produced by Barcelonan bilinguals in Davidson (2014a: 232), which tended to show F2 values of either above 1500hz or below 1200hz.

Accordingly, individual /l/ tokens were categorized as light or dark if they exhibited an F2 value greater than 1500hz or less than 1200hz, respectively. Once the set of light and dark laterals was identified, 10 of each kind were chosen to be spliced onto the template /l/ passage. Although Praat allows the researcher to manually adjust pitch, large manipulations in pitch are detectable, sounding machine-like and unnatural. Accordingly, in selecting a light [l] and a dark [ɫ] for each of the 10 instances of /l/ in the /l/ passage, care was taken to select tokens whose pitch contours least deviated from those of the /l/s produced in the /l/ template. Note that the average F2 of the 10 selected [l] tokens was 1681hz, whereas the average F2 of the 10 selected [ɫ] tokens was 1048hz. This constitutes an average difference in F2 (between the dark and light laterals) of over 600hz, or more than double the 300hz distance between light and dark laterals (i.e., 1500hz and 1200hz) reported in the aforementioned Catalan and Spanish research.

⁶⁹ Proctor (2009: 62) notes that cross-linguistically, laterals with F2 values above or below 1200hz are typically perceived as respectively either clear or dark.

Once the 20 /l/ tokens were identified, their boundaries for splicing needed to be established. Following Campbell-Kibler (2006: 88-89), we looked for the nearest pause, stop closure, fricative, or stable sonorant to the /l/ segment. Regarding [l] tokens, since the /l/ template onto which they were to be sliced was carefully read (maximally monolingual-like) Spanish speech, many [l]s were able to be directly inserted into the template without a problem. However, a minority of [l]s and almost all [ɫ] tokens were unable to be directly inserted into the template naturally due to a lack of a natural vocalic transition. In other words, as suggested in Recasens (1986; 1991; 2004; 2012; 2014b), Recasens & Espinosa (2005), Recasens et al. (1995), and Vann (2001: 124), the vowel preceding /l/ is colored by the lateral's degree of darkness, such that the transition between a vowel originally preceding a light [l] to a dark [ɫ] is extremely unnatural. Because of this complication, the majority of [ɫ] tokens (and a few [l] tokens that simply sounded unnatural when placed adjacent to the preceding vowel in the template /l/ passage) were spliced out with their preceding vowel, which exhibited an F2 of different quality than the vowel present in the template /l/ passage. Thus, in order to maximize the naturalness of the guises, we were forced to forgo a strict synthesis of minimal pair recordings differing exclusively in /l/ segments in favor of a synthesis of /l/ guises differing in vowel + lateral sequences. At the end of this stage, we had synthesized two /l/ passages, differing only with respect to their /l/ segments and (for many but not all /l/ tokens) the quality of the vowel preceding them.

As for the splicing out of intervocalic [s] and [z] tokens, parallel to the aforementioned laterals, it was first necessary to establish a means for discretely distinguishing voiceless fricatives from voiced fricatives. As previously discussed in section 2.2.1, several authors advocate for the treatment of fricative voicing and related lenition phenomena (particularly in Spanish) as a gradient phenomenon without categorical boundaries between voiceless and voiced fricatives (Erker 2012; File-Muriel & Brown 2011;

Gradoville 2011; Rohena-Madrado 2011; Romero 1999; Torreira & Ernestus 2012). Nonetheless, File-Muriel & Brown (2010, 46-47; 2011, 224-225) note that the majority of empirical research on /s/ lenition phenomena in Spanish not only establish thresholds between /s/ variants, but do so impressionistically, using native speaker judges to code /s/ productions by ear. Even for Catalan, for example, Benet et al. (2012: 396-397) recently distinguished between [z] and [s] productions impressionistically.

Still, some thresholds for /s/ voicing distinctions in Spanish have been reported on the basis of empirical data and acoustic analysis. Schmidt & Willis (2011: 6) found that voiced [z] productions in Mexico City Spanish tended to exhibit voicing durations lasting 60% or more of the segments' durations, and accordingly coded tokens with 59% or less voicing as [s] and tokens with 60% or more as [z]. For Madrid Spanish, tokens classified as voiced [z] were exclusively those with voicing durations lasting through the entire /s/ segment (i.e., 100% voicing) (Torreira & Ernestus 2012: 133). Campos-Astorkiza (2014: 21-23) applied coding schemes that matched the trends in her data; most /s/ tokens preceding a voiceless consonant exhibited voicing durations of 20% or less and were coded as [s], whereas most /s/ tokens preceding a voiced consonant exhibited voicing durations of 90% or more and were coded as [z]. Davidson (2012b: 40; 2014a: 232; forthcoming) found that 95% of all Spanish intervocalic /s/ tokens produced by Catalan-Spanish bilinguals exhibited voicing durations lasting less than 30% or more than 60% of each /s/ segment's length, and thus coded [s] and [z] using these cutoff voicing durations.

Accordingly, intervocalic /s/ tokens were categorized as voiceless or voiced if they exhibited voicing durations lasting less than 30% or more than 60% of each segment's length, respectively. Once the set of voiceless and voiced alveolar fricatives was identified, 10 of each kind were chosen to be spliced onto the template intervocalic /s/ passage. Note that the average voicing duration of the 10 selected [s] tokens was 11%, whereas the average voicing

duration of the 10 selected [z] tokens was 100%. This constitutes an average difference in voiced segment duration between voiceless and voiced alveolar fricatives of nearly 90%, nearly tripling the 30% distance established in the aforementioned CCS research. In order to identify fricative segments' boundaries for splicing, we manually marked left and right boundaries for each /s/ segment by using both the waveform and spectrogram to respectively find the zero-intercept in the waveform closest to the first and last signs of aperiodic noise in the spectrogram (cf. Campos-Astorkiza 2014: 21; Erker 2012: 56-57; File-Muriel & Brown 2011: 227-228; Schmidt & Willis 2011: 6). Unlike /l/ splicing, in which the adjacent vowel often exhibited noticeable cues of velarization degree, /s/ splicing was unproblematic. A simple cut and paste procedure produced natural-sounding intervocalic /s/ sequences. At the end of this stage, we had synthesized two /s/ passages, differing only with respect to their /s/ segments.

The final step in the synthesis process, as described earlier, was the manipulation of pitch, duration, and intensity of /l/ and intervocalic /s/ tokens in the four guises (dark /l/, light /l/, voiced /s/, voiceless /s/). Following Campbell-Kibler (2006: 89-90), we first made minor adjustments to the pitch of segments that sounded unnatural with respect to the pitch contours they formed with adjacent segments. This was done by manually adjusting the pitch nodes to match those of the /l/ and /s/ segments of the original (unspliced) template passages (accomplished using the *to manipulation > edit* feature and the extraction of the pitch track of the original template sound files).

Second, we manually adjusted the duration of /l/ and intervocalic /s/ segments that deviated noticeably (i.e., sounded audibly unnatural) from the original durations of /l/ and /s/ in the template file (this was accomplished using the *to manipulation > edit* feature and placing duration points at the start, middle, and end of each manipulated segment, and subsequently dragging the middle duration point to a factor above 1.0 [to lengthen the

segment] or below 1.0 [to shorten the segment]). As a final note regarding segment duration, once all appropriate [s] segments were adjusted in duration in the [s] guise, we adjusted the duration of the corresponding [z] segments in the [z] guise so that each [z] token was 64% shorter in duration than [s]. This was done in light of frequently attested finding across several languages of a negative correlation between voicing degree and length of fricative segment (cf. Gradoville 2011; Hualde & Prieto 2014; Rivas 2006; Schmidt & Willis 2011; Stevens et al. 1992; Torreira & Ernestus 2012). In particular, Davidson (2012b: 27) found that [z] segments were on average 64% shorter in total duration than [s] segments, and we have accordingly maintained this difference in duration between the /s/ guises. A parallel correlation between lateral darkness and duration has not been consistently found (Hofwegen 2009: 305-306), and thus durations of [l] and [ɫ] were not systematically manipulated.

Third, and finally, for instances in which the intensity of the spliced /l/ or /s/ segment deviated noticeably from the adjacent segments in the template, we adjusted their intensity to match that of surrounding segments by first extracting the intensity of surrounding segments (using the *query > get intensity* feature) and subsequently scaling the /l/ or /s/ segment to this value (using the *modify > scale intensity* feature). At the end of this stage, we had fully synthesized four guises: two /l/ guises, differing by an average F2 of roughly 600hz, and two /s/ guises, differing by an average of nearly 90% voiced segment duration. Below, in figures 3 and 4, we show examples of the spectrogram of synthesized [l], [ɫ], [s], and [z] tokens (note that in each figure, we manually have juxtaposed corresponding /l/ and intervocalic /s/ tokens for the ease of more direct comparisons).

Figure 3 - Spectrogram Analysis of [l] (~1664hz) and [ɫ] (~1100hz) in *al final decidi*

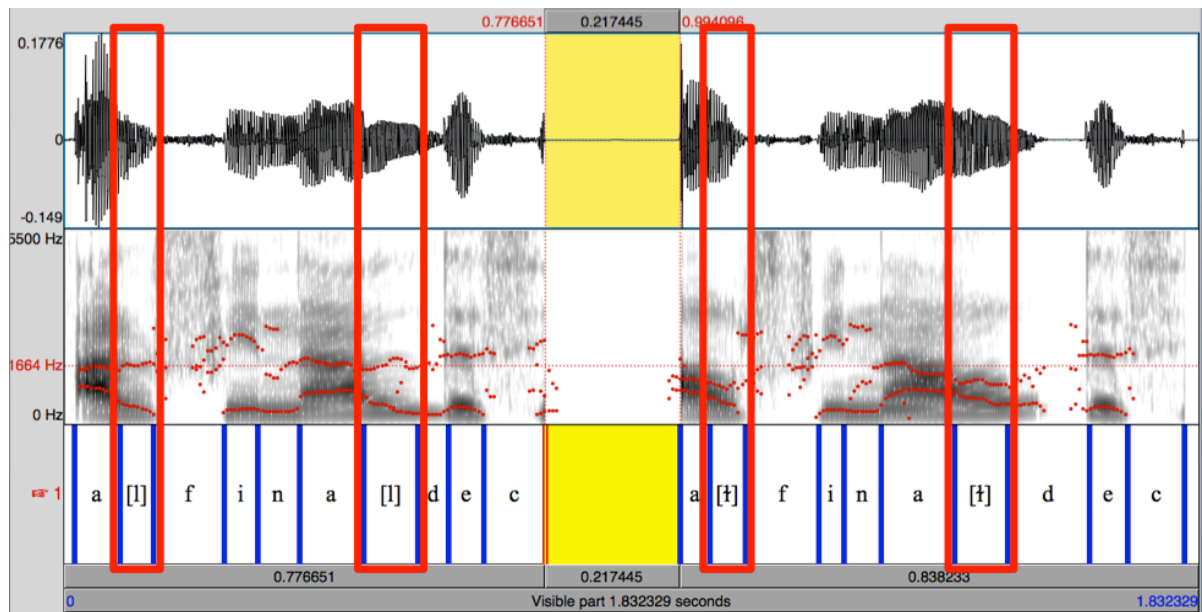
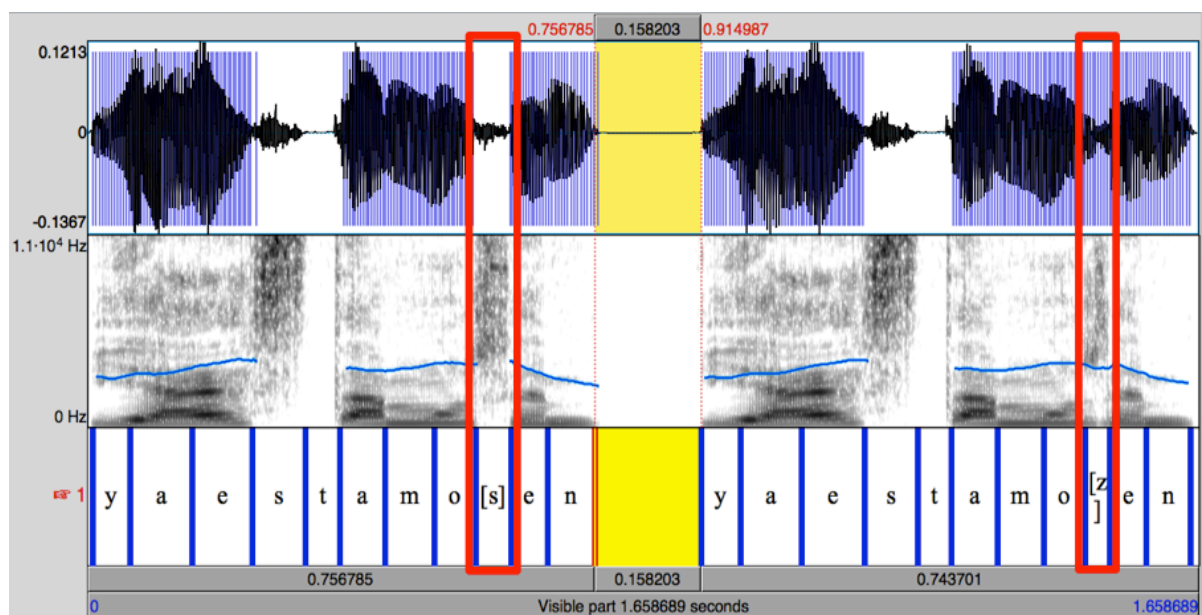


Figure 4 - Spectrogram Analysis of [s] (~9% voiced) and [z] (100% voiced) in *ya estamos en*



3.3.5.4. Matched Guise Questionnaire

Following Campbell-Kibler (2006: 219-221), the questionnaire with which listeners respond to the speech stimuli played for them combined adjectives and phrases on semantic

differential scales (cf. Osgood, Suci, & Tannenbaum 1957) and individual adjectives or phrases lacking scales. The former allow for a quantitative comparison of average rating values, such as if the listener perceives the [l] guise as having a significantly higher or lower power status than the [h] guise, whereas the latter facilitate more qualitative comparisons, such as whether or not the trait of speaking Catalan and being more or less educated were related (i.e., if a listener were more likely than not to perceive a guise as more or less educated if the listener *did* believe the guise spoke Catalan). The combination of more quantitative (scaled) and qualitative (non-scaled) analyses will provide stronger evidence for attitudes associated with CCS features. This questionnaire appears as appendix F. Note also that semantic differential scales feature 7-point tiers as motivated over 5- or 9-point tiers by Al-Hindawe (1996: 7).

The selection of adjectives/phrases for semantic differential scales was informed by frequently incorporated attributes reflecting *solidarity* (that is, social attractiveness as related to being amusing, likeable, physically attractive, sensitive, generous, and open) and *status* or *power* (that is, a level of respect as related to being intelligent, cultured, self-confident, hardworking, a leader, and trustworthy) (Newman 2011: 40). The three adjective/phrase pairs reflecting solidarity are ‘nice-mean’ (*simpático-antipático*), ‘pleasant-unpleasant to listen to’ (*agradable-desagradable de escuchar*), and ‘would easily-not easily be my friend’ (*sería-no sería mi amigo fácilmente*), whereas the three reflecting power are ‘educated-uneducated’ (*tiene-no tiene estudios*), ‘trustworthy-untrustworthy’ (*fiable-dudoso*), and ‘has a high-low paying job’ (*tiene un trabajo que le pagan bien-mal*). Regarding the choice of the remaining 6 scaled adjective/phrase pairs and all of the non-scaled adjectives/phrases, these were selected based on the aforementioned literature (in sections 2.1.4 and 2.2.4) on attitudes toward CCS speech features. The non-scaled pairs, for example, are ‘hard-working-lazy’ (*trabajador-perezoso*), ‘rich-poor’ (*rico-pobre*), and ‘cultured-peasant-like’ (*culto-*

campesino). Additionally, the questionnaire included a final set of non-scaled characteristics targeting the listener's perception of the guise as being bilingual (i.e., the guise speaks Basque, Catalan, Galician, etc.), the guise's possible occupation (lower class, e.g. *granjero* 'farmer,' *cajero* 'cashier,' *taxista* 'taxi-driver; middle class, e.g. *maestro* 'teacher,' *comerciante* 'shopkeeper,' *gerente* 'manager; and upper class, e.g. *banquero* 'banker,' *político* 'politician,' *abogado* 'lawyer'), and the country and/or region where the guise learned Spanish.

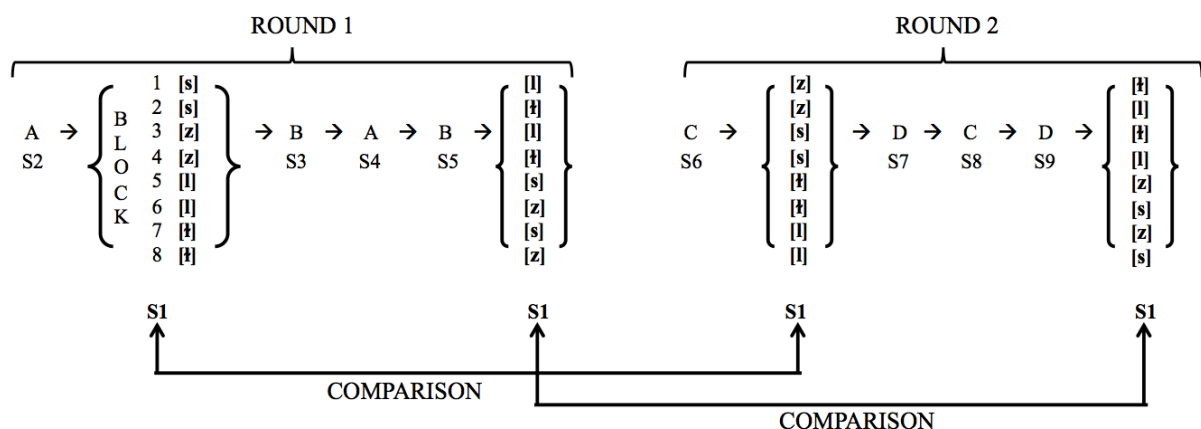
3.3.5.5. Presentation of Matched Guise Stimuli

Following Stefanowitsch (2005: 1), the four guises were placed in a set order between a series of fillers that serve to decrease the risk that listeners would remember the voice qualities of the guises and realize they were produced by the same speaker. Four filler passages were used, which, like the /l/ and intervocalic /s/ passages themselves, consisted of approximately 80 words (~30 seconds long) and incorporated neutral, non-biased content. These are also presented below in appendix E. In order to maximally mask the actual guise's voice, since the /l/ and intervocalic /s/ passages each appeared twice, the four filler passages also appeared twice, necessitating 8 additional (filler) guise speakers. The 8 additional speakers, half male and half female, were native Spanish speakers of various dialects of Spanish (both Peninsular and Latin-American, but crucially not CCS).

The matched guise set-up, illustrated below in figure 5, maximally separates the actual light/dark and voiceless/voiced guises by three fillers, as well as separates each passage type and speaker by at least 1 different passage type and speaker. Note that "S" refers to the speaker, whereas "A/B/C/D" references the filler passage, and "LIGHT / DARK / VOICELESS / VOICED" references the actual guises spoken by speaker 1. Moreover, note that rather than include both linguistic variables (/l/ and /s/) in a single matched guise task,

we have separated them for presentation in two distinct rounds. This was purposefully done as a precautionary measure in order to lessen the possibility that a listener realizes that the target guises are produced by the same speaker. Since only a single sound distinguishes the voiceless and light guises from the voiced and dark guises respectively, there is a greater chance that listeners identify the speaker of each respective guise as a single individual (in comparison with more traditional matched guise designs whose target guises represent completely different language varieties). Accordingly, by separating the target variables into two rounds of matched guise that can be offset by a different kind of task, we may increase the overall amount of time between the presentations of target guises, increasing the likelihood that listeners forget the voice quality of the target guise speaker. In order to avoid confounds of the order in which the guises were heard, a total of 8 block orders for target guises were established (i.e., the first block order was the [s] guise, followed by the [l] guise, followed by the [z] guise, followed by the [h] guise).

Figure 5 - Presentation of Matched Guise Stimuli



3.3.6. Debriefing Interview

The final test instrument implemented in this study is a follow-up debriefing interview lasting approximately 5 minutes. In order to complement the covert attitudinal and perception data

obtained from the matched guise task, the debriefing interview was used to elicit overt opinions about the linguistic variables under study, the Spanish of Catalonia (or Catalanized Spanish more generally), and awareness of CCS features. More specifically, the researcher directly asked participants the following questions, allowing additionally for the participants to express any other opinions they felt were prudent:

- Did you think any of the voices you just listened to were Catalan-speakers? If so, why did you think they spoke Catalan? How could you tell?
- What makes up a Catalan accent in Spanish? What does the accent of a heavily Catalanized Spanish sound like?
- Do you think you speak Spanish with a Catalan accent? Why or why not? Would you like it if somebody told you they could tell by your Spanish that you were Catalan?
- Is speaking Spanish with a Catalan accent ok? Is it viewed favorably in Catalonia? What about outside of Catalonia?
- Are there certain things you try to avoid (words, sounds, grammatical constructions) when you speak Spanish?

3.4. Data Collection

Participants were recorded using an SE50 Samson head-mounted condenser microphone and an H4n Zoom digital recorder 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*, in a quiet room in the *Centro de Estudios de Posgrado* at the *Universidad Autónoma de Madrid*, or in a quiet location specified by the participant. The matched guise stimuli were played from a portable iPod (as .wav files) using a set of Yamaha RH3C closed circumaural headphones.

The order of the experiment tasks was the same for all participants, although Madrid monolinguals did not complete the Catalan oral elicitation task (nor did their socio-

demographic questionnaires contain specific references to Catalan). First, (bilingual) participants completed the oral elicitation task in Catalan, as this was the only test instrument eliciting Catalan speech data. Second, participants filled out a portion of the socio-demographic questionnaire in Spanish, namely questions 9-22 on language use and attitudes, which served as a time-filler so that bilingual speakers could have ample time to switch out of a Catalan mode before producing Spanish speech. Third, participants completed the oral elicitation task in Spanish. Fourth, participants completed the sociolinguistic oral interview. Fifth, participants completed the first round of the matched guise task. Sixth, participants complete the remaining socio-demographic information questions (1-8) on the socio-demographic questionnaire, which served as a time filler so that the guises in the previous first round of the matched guise were more likely to be forgotten. Seventh, participants completed the second round of the matched guise task. Lastly, participants completed the follow-up debriefing interview on explicit and overt attitudes toward CCS, and CCS features. Figure 6 below illustrates the components of the experiment.

Figure 6 - Order of Experimental Tasks

- | |
|--|
| <ol style="list-style-type: none"> 1) Catalan (Formal) Oral Elicitation Task 2) Language Use and Attitudes Section of the Socio-Demographic Questionnaire (Questions 9-22) 3) Spanish (Formal) Oral Elicitation Task 4) Sociolinguistic Interview (Casual Spanish Speech) 5) Matched Guise Task – Round 1 6) Socio-Demographic Information Section of the Socio-Demographic Questionnaire (Questions 1-8) 7) Matched Guise Task – Round 2 8) Matched Guise Debriefing Interview (Elicitation of Overt CCS Attitudes) |
|--|

3.5. Data Analysis

In the following sections we detail how /l/ and intervocalic alveolar fricative productions in

Spanish and Catalan were submitted to acoustic analysis in Praat. Additionally, the technique used for the normalization of laterals is detailed.

3.5.1. Acoustic Analysis of Catalan and Spanish Laterals

Lateral velarization is frequently examined as a function of second formant frequency (F2), which inversely correlates with degree of velarization: less velarized laterals exhibit greater F2 values and more velarized laterals exhibit lesser F2 values (Martínez Celdrán & Fernández Planas 2007; Pieras 1999; Quilis 1981; Recasens 1986; 1991; 1996; 2004; 2014b; Recasens & Espinosa 2005; Recasens et al. 1995; Simonet 2008; 2010a; 2010b). Accordingly, following Simonet (2008: 266), F2 values were measured from each /l/ production's midpoint, calculated from hand-marked segment boundaries via transition cues in the waveform and spectrogram. Following Simonet (2010a: 668; see also Escudero, Boersma, Schurt Rauber, & Bion 2009: 1381-1382), in order to minimize formant tracking errors, the number of formants and the format ceiling for each lateral were specified according to linguistic context and speaker gender, adapted by trial and error from those used in Simonet (2010a: 668): for female and male speakers respectively, F2 values for /l/ tokens adjacent to /a/ were estimated with 2 formants below 2500hz or 2000hz, F2 values for /l/ tokens adjacent to /e/ or /i/ were estimated with 3 formants below 2500hz, F2 values for /l/ tokens adjacent to /o/ were estimated with 3 formants below 2500hz or 2000hz, and F2 values for /l/ tokens adjacent to /u/ were estimated with 2 formants below 2250hz or 1750hz. Any gross tracking errors were corrected by hand. Example spectrograms illustrating a lighter and darker realization of /l/ produced by different speakers, in addition to the formant number/ceiling correction process are shown below as figures 7, 8, 9, and 10.

Figure 7 - Speaker 172 (Group C, younger male) Rendition of Token 97 *al camarero* ‘to the waiter’ (~1517hz)

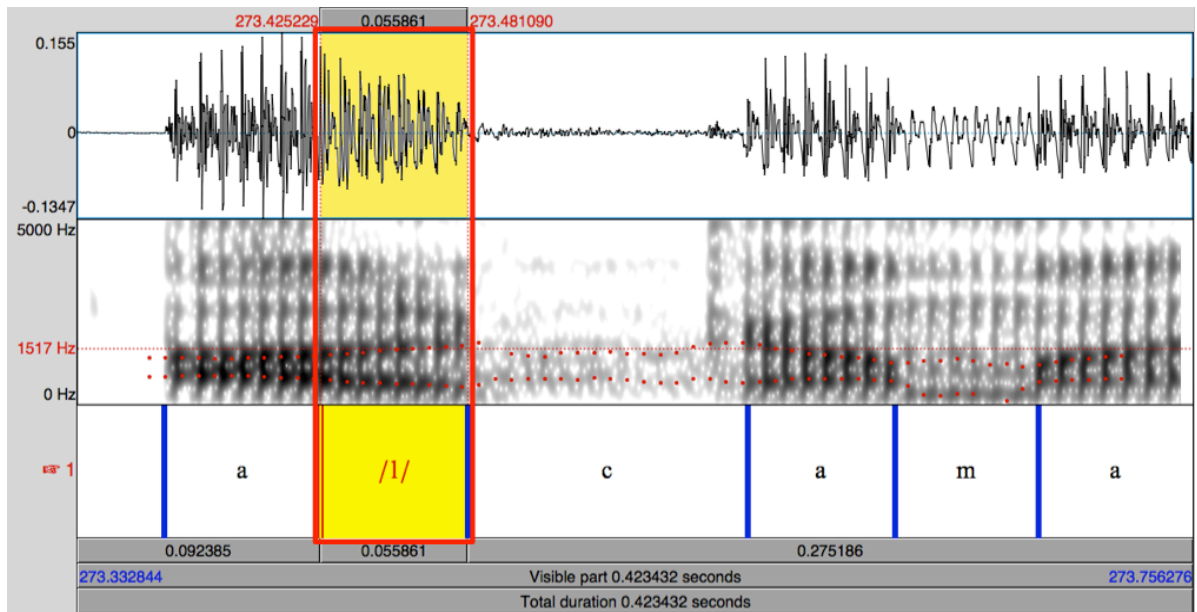


Figure 8 - Speaker 144 (Group A, younger male) Rendition of Token 97 *al camarero* ‘to the waiter’ (~1085hz)

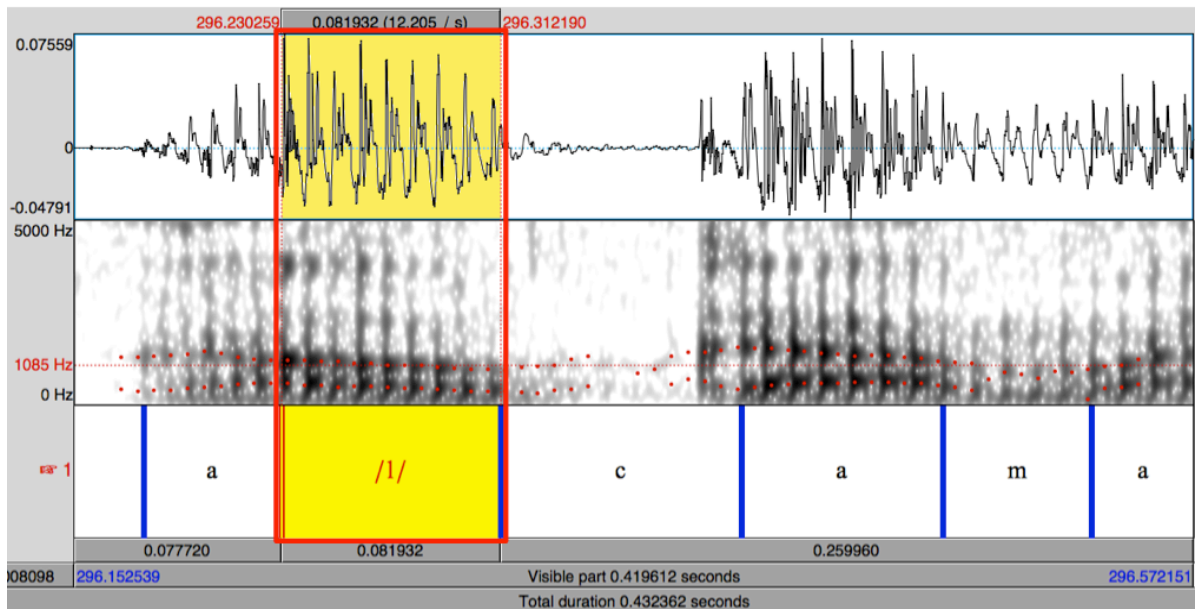


Figure 9 - Formant Tracking Error Using Standard 5 Formant Under 5500hz Detection
 (Speaker SM 109 [Group D, female] Rendition of Token 31 *piel blanca* ‘white skin’)

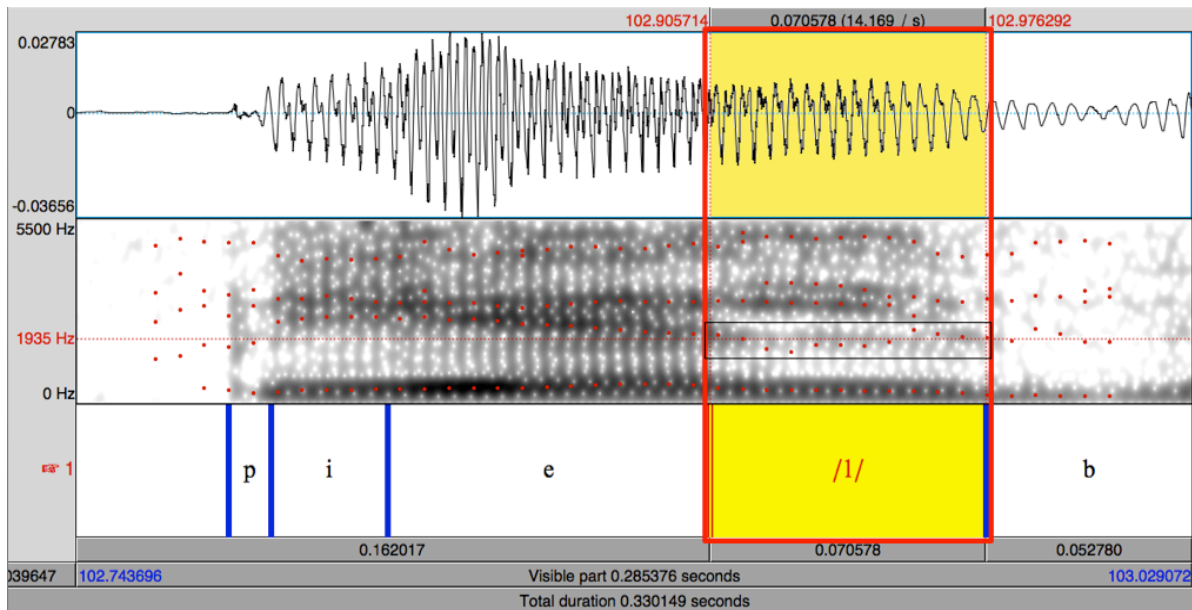
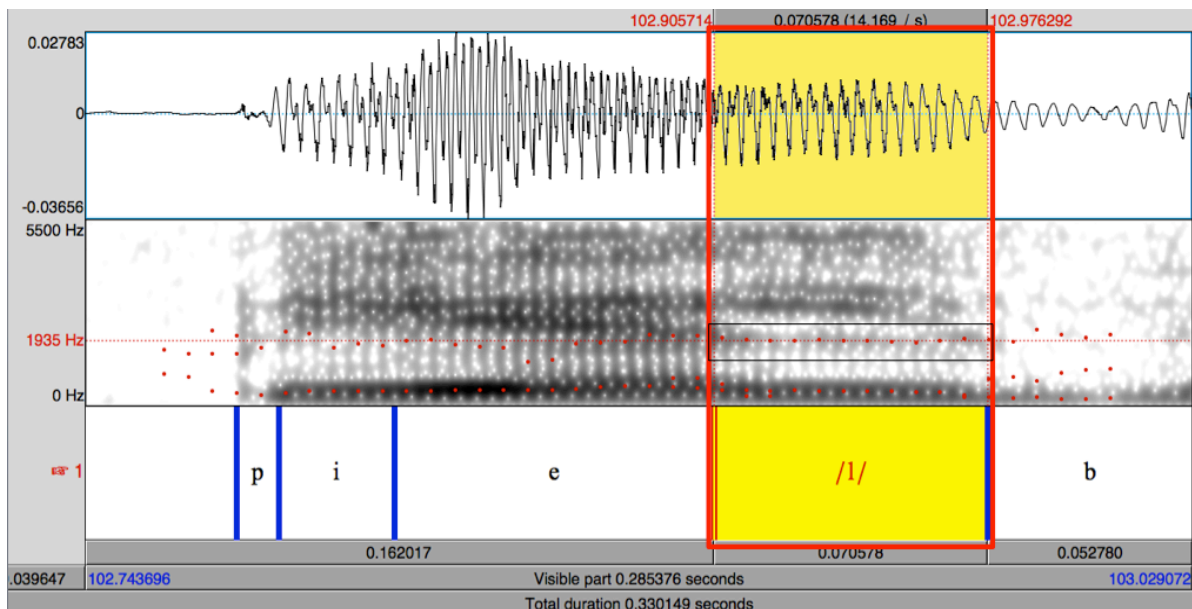


Figure 10 - Formant Tracking Context-Dependent Correction: 3 Formants Under 2500hz
 (Speaker SM 109 [Group D, female] Rendition of Token 31 *piel blanca* ‘white skin’)



After midpoint F2 (hertz) values were extracted by means of a Praat script, they were converted from hertz into Bark units (cf. Zwicker 1961) using the following transformation

employed by Praat:

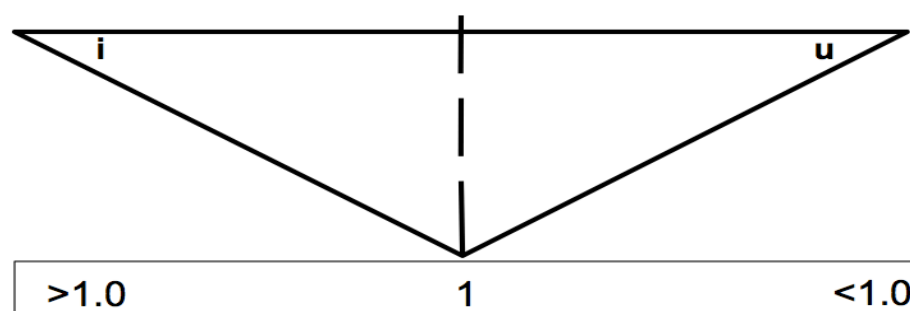
Figure 11 - Equation for the Transformation of x Hertz into Bark Units

$$7 \ln \left(\frac{x \div 650}{\sqrt{1 + \left(\frac{x}{650}\right)^2}} \right)$$

Once F2 values were converted into Bark units, they were subsequently transformed (or normalized) using an adaptation of the S-procedure (cf. Fabricius 2007; Watts & Fabricius 2002) employed by Simonet (2008; 2010a). This normalization procedure expresses individual /l/ tokens as terms of how ‘[u-]like’ (more velarized) or ‘[i]-like’ (less velarized) they are in relation to each speaker’s vowel space. More specifically, each speaker’s vowel space is calculated (in terms of F2) by measuring the average F2 value (converted to Bark units) for the vowels /u/ and /i/ using the tokens listed (and underlined) in appendix B as normalization items (i.e., per-speaker averages of 8 Catalan /i/ tokens, 8 Catalan /u/ tokens, 4 Spanish /i/ tokens, and 4 Spanish /u/ tokens). Once these /u/ and /i/ limits are established for a given speaker, they are averaged together and serve as the denominator over which the F2 (in Bark) of an individual /l/ token is divided, yielding a normalized F2 value with respect to 1. Normalized F2 values greater than 1 denote more [i]-like (or less velarized) laterals, whereas normalized F2 values less than 1 denote more [u]-like (or more velarized) laterals. This normalization procedure is illustrated below in figure 12. Note that this normalization method allows for the treatment of lateral velarization as a gradient phenomenon along a scalar continuum of darkness (cf. Recasens 1996; 2004; 2012; 2014b; Recasens & Espinosa 2005;

Recasens et al. 1995; Simonet 2010a; Simonet 2010b).

Figure 12 - Adapted S-Normalization Procedure



$$\text{Normed } F2 // = \frac{F2 //}{\left(\frac{\mu F2 //i/ + \mu F2 //u/}{2} \right)}$$

In order to facilitate direct comparisons between laterals produced in Catalan and in Spanish, it was necessary to confirm that the vowel spaces across the languages did not significantly differ from one another. Accordingly, a linear mixed-effects regression (with independent variables of vowel [/i/ vs. /u/], language [Catalan vs. Spanish], and the interaction between vowel and language) was run with F2 (in Bark) as the dependent variable and speaker as a random effect. Crucially, neither the main effect of language ($F(1,1050) = 1.06$; $p = 0.3$) nor the interaction between language and vowel ($F(1,1050) = 2.93$; $p = 0.09$)⁷⁰ was statistically significant, confirming that the vowel spaces for Catalan and Spanish are not distinct, which validates the use of the S-normalization procedure across the two languages indiscriminately.

3.5.2. Acoustic Analysis of Catalan and Spanish Intervocalic Fricatives

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

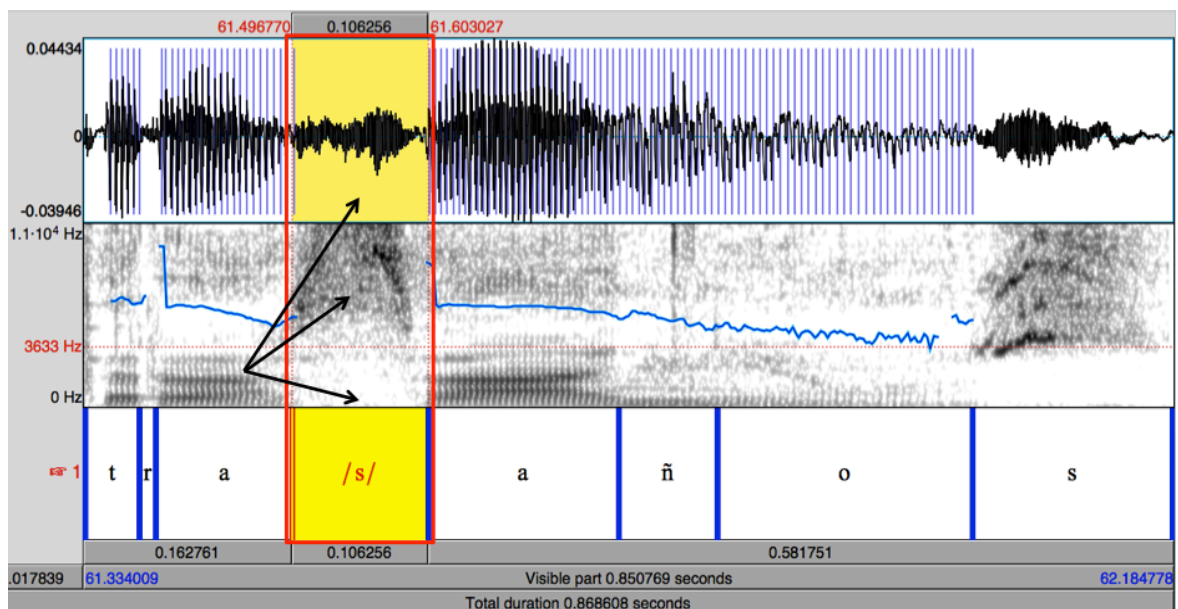
⁷⁰ The estimated variance of the random effect of speaker was 0.0006966.

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 (2011) 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 (2011) as a valid measure of fricative voicing, has been used to examine /s/ voicing assimilation in Mexican Spanish (cf. Schmidt and Willis 2011), Madrid Spanish (cf. Hualde & Prieto 2014; Torreira and Ernestus 2012), and North-Central Peninsular Spanish (Campos-Astorkiza 2014), facilitating more transparent comparisons of the present CCS data with these Spanish 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 (cf. Campos-Astorkiza 2014: 21; Erker 2012: 56-57; File-Muriel & Brown 2011: 227-228; Rohena-Madrado 2011: 31-33; Schmidt & Willis 2011: 6). 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 (cf. Campos-Astorkiza 2014: 21; Gradoville 2011; Hualde 2014: 48-53; Rohena-Madrado 2011: 31-33; Schmidt & Willis 2011: 6; Torreira & Ernestus

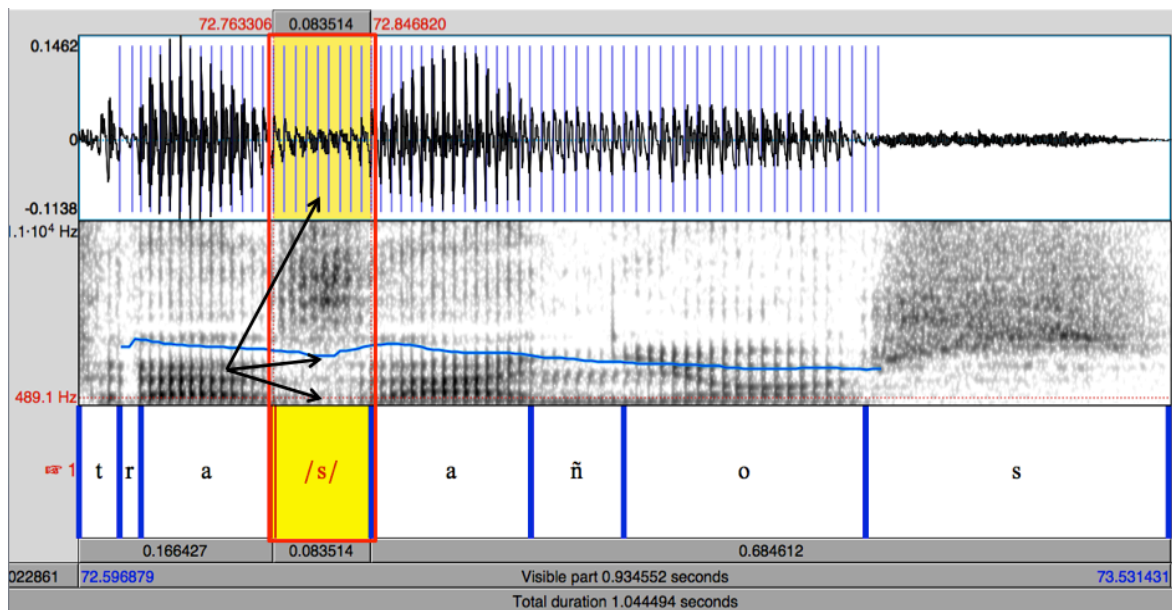
2012). Note that voicing duration measurements were calculated only after adjusting the Praat spectrogram viewing window to be exactly twice the size of the /s/ segment and centered on the /s/ segment, as the F0 contour in the spectrogram is calculated with respect to the segments in the visible window.⁷¹ Example spectrograms illustrating a less voiced and more voiced realization of Spanish intervocalic /s/ produced by different speakers are shown below as figures 13 and 14.

Figure 13 - Speaker 106 (Group C, younger female) Rendition of token 19 *tras años* ‘after years’ (~5% voiced)



⁷¹ Note that our choice to pursue this manual measuring of the duration of F0 track (as accompanied by glottal pulses and the voice bar) as opposed to using Praat’s voicing report function was motivated by the random probability for error in relying on the voice report function, whose pulse-based algorithm occasionally reports invalid percentages of locally unvoiced frames that do not match the spectral activity shown in the spectrogram (Gradoville 2011: 69-71).

Figure 14 - Speaker 193 (Group A, younger male) Rendition of token 19 *tras años* ‘after years’ (100% voiced)



3.6. Total Counts of Collected Token Data

With respect to lateral production in Spanish and Catalan, the formal speech elicitation tasks (phrase-list readings) yielded a total of 4,320 Spanish /l/ tokens and 864 Catalan /l/ tokens. Those (relatively few) tokens with erroneous formant structures and/or notable speaker disfluencies were discarded from analysis, leaving 4,113 Spanish /l/ tokens (roughly 76 out of a possible 80 tokens per speaker) and 744 Catalan /l/ tokens (roughly 16 out of a possible 18 tokens per speaker) for subsequent statistical analysis. As for the casual Spanish /l/ data from the sociolinguistic interview, since the /l/ tokens produced were not predictable by the researcher, efforts were made to select a subset of all /l/ tokens uttered by each speaker that was maximally balanced both in number and with respect to the four linguistic factor contexts specified in section 3.1.1. Accordingly, each speaker contributed a total of precisely 20 casual Spanish /l/ tokens, perfectly balanced across the factors of syllable position and surrounding segment place of articulation, and maximally balanced across the two remaining

factors of Catalan cognate status and word class type (which recall from footnote 65 were combined into a single factor with 3 levels). This was the highest number of /l/ tokens produced by all speakers that offered the most parallel distribution of linguistic factor contexts as compared with the /l/ tokens elicited from the formal speech task, permitting a more valid comparison of /l/ production across the two speech styles, crucially independently of the four linguistic factor contexts. With the addition of these 1,080 casual Spanish /l/ tokens (20 per 54 speakers), the total amount of Spanish /l/ tokens available for statistical analysis was 5,193 (which equates to roughly 96 tokens per speaker).

With respect to intervocalic alveolar fricative production in Spanish and Catalan, the formal speech elicitation tasks (phrase-list readings) yielded a total of 4,320 Spanish /s/ tokens and 864 tokens of Catalan /z/ and prevocalic word-final /S/. 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) and 822 Catalan /s/ tokens (roughly 17 out of a possible 18 tokens per speaker) for subsequent statistical analysis. Regarding the casual Spanish /s/ data from the sociolinguistic interview, as was discussed above, efforts were made to obtain a dataset that would be maximally balanced and comparable with the Spanish formal speech data. Accordingly, each speaker contributed a total of precisely 20 casual Spanish /s/ tokens, perfectly balanced across the factors of syllable position and stress, and maximally balanced across the remaining factor of word class type. 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 formal speech task, permitting a more valid comparison of /s/ production across the two speech styles, crucially independently of the three linguistic factor contexts. With the addition of these 1,080 casual Spanish

intervocalic /s/ tokens (20 per 54 speakers), the total amount of Spanish /s/ tokens available for statistical analysis was 5,216 (which equates to roughly 97 tokens per speaker). Table 9 offers a summary of the collected /l/ and /s/ token counts, below.

Table 9: Elicited Data Counts for Laterals and Intervocalic Alveolar Fricatives in Spanish and Catalan

	/l/	Intervocalic /s/ (Also /z/ for Catalan)	TOTAL
Spanish	5,193	5,216	10,409
Catalan	744	822	1,566
TOTAL	5,937	6,038	11,975

CHAPTER 4: RESULTS - LATERAL VELARIZATION IN BARCELONAN CCS

In this chapter, we present the results of a set of descriptive and inferential statistics on the lateral data collected from the Catalan and Spanish formal speech phrase-list readings, Spanish casual speech from the sociolinguistic interviews, covert attitudes toward Spanish lateral velarization from the matched guise, and overt attitudes toward CCS and CCS [ɫ] from the debriefing interviews. We shall aim to answer the following research questions specific to the phenomenon of lateral velarization:

RQ1: To what extent is lateral velarization present in modern Barcelonan CCS (as compared with non-contact, monolingual Spanish varieties)?

RQ2: What are the social (language-external) constraints affecting lateral velarization in Barcelonan CCS?

RQ3: What are the linguistic (language-internal) constraints affecting lateral velarization in Barcelonan CCS?

RQ4: Is there evidence of the diffusion of CCS dark [ɫ] across the bilingual Catalan-Spanish speech community? If so, is this diffusion ongoing (i.e., is there evidence of a linguistic change in progress)?

RQ5: What are the overt and covert social evaluations of CCS dark [ɫ]? How do these relate to social evaluations of “Catalanized Spanish” more generally? Additionally, how are differences in social values between the variants manifested in the paths of selection and propagation of each variant?

RQ6: What evidence is there to support an account of CCS dark [ɫ] as contact-induced? What evidence exists in favor of an endogenous account?

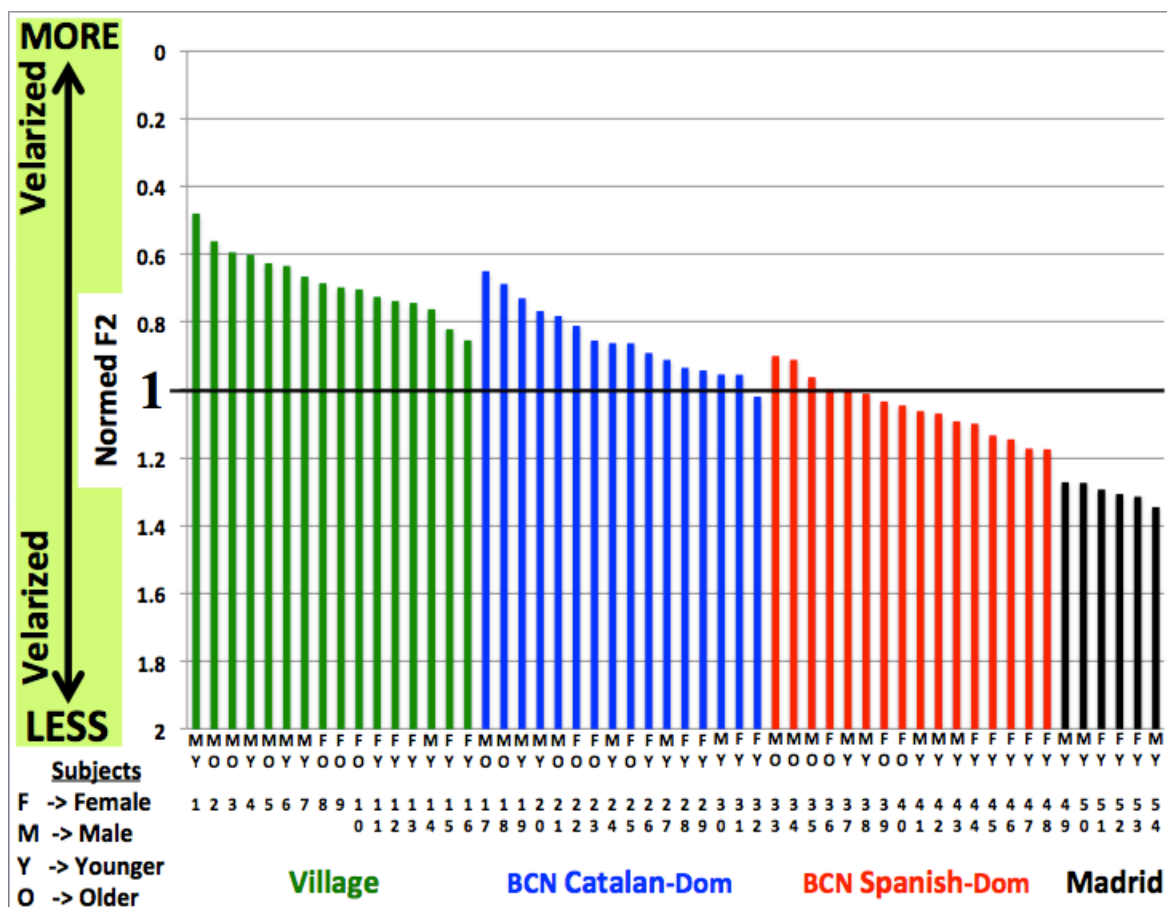
4.1. Elicited Production of Laterals

4.1.1. Group Trends and Individual Comparisons

In order to give a better perspective of the overall distribution of higher and lower degrees of

lateral velarization found in the speech of the tested populations, the average degree of Spanish lateral velarization across all elicited tokens of /l/ (from the formal speech reading and casual interview tasks) was computed for each speaker. These velarization degrees appear below in figure 15. Note that speakers are organized according to the Catalan exposure and usage groups previously detailed in table 8 in section 3.2.3: Village speakers (Group A) are those from smaller, more rural villages on the outskirts of the BMA, Catalan-dominant Barcelona bilinguals (Group B) are speakers from the city of Barcelona that use Catalan considerably more than Spanish, Spanish-dominant Barcelona bilinguals (Group C) are speakers from the city of Barcelona that use Spanish considerably more than Catalan, and lastly Madrid speakers are monolingual Spanish speakers from Madrid (Group D).

Figure 15 - Average Spanish Lateral Velarization Degree per Speaker

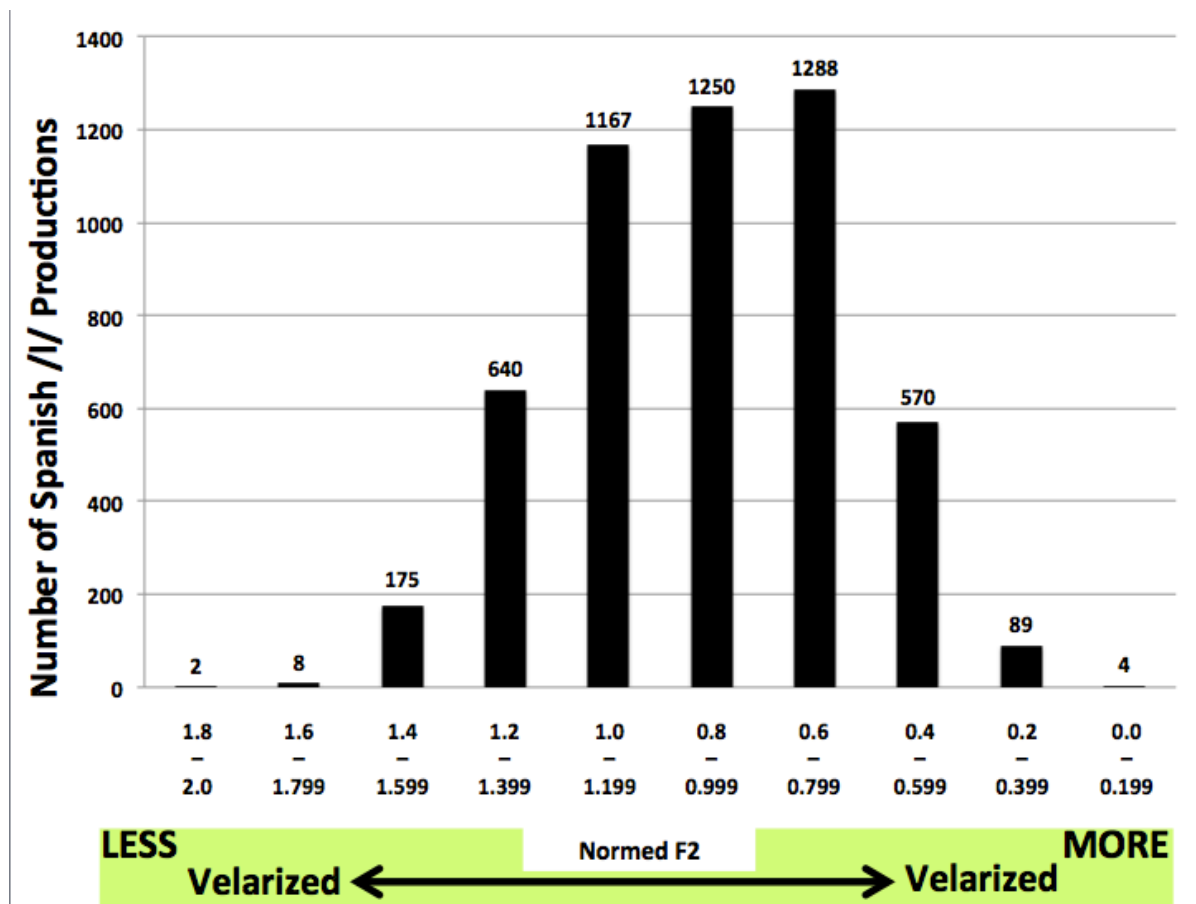


Recall that (normalized) F2 values greater than 1.0 indicate a more [i]-like (or less velarized) production of /l/, whereas those less than 1.0 indicate a more [u]-like (or more velarized) production of /l/. Though the effects of social factors such as speaker group (that is, degree of exposure to and usage of Catalan), age, and gender are tested using inferential statistics in sections 4.1.2 and 4.1.3, some initial trends are transparent from the raw velarization degrees depicted in figure 15. Most notably, though all speaker groups show a degree of within-group variation in /l/ velarization, velarization degrees steadily decrease with lesser exposure and usage of Catalan, from the Village group (A) progressively to the Madrid monolingual group (D). This serves as a preliminary indication that the exposure to and usage of Catalan directly affects CCS velarization degrees, consistent with the speculation of contact-induced innovation. Additionally, all bilingual groups (A, B, C) show some overlap in velarization degrees for select speakers, such that for example, the velarization degrees of subjects 17 through 22, who velarize the most in their group (B), are comparable to those of select speakers in Group A who have the lowest velarization degrees in their group (subjects 13-16, for example). Curiously, a closer inspection of the bilingual speakers that velarize the most or the least in their respective groups reveals that the most velarizing bilingual individuals (per bilingual group) are predominantly older males, whereas the least velarizing bilingual individuals (per bilingual group) are predominantly younger females. This serves as a preliminary confirmation that age and gender play an important role in mediating this phenomenon in CCS, and furthermore is consistent with the scenario in which greater degrees of velarization, being a non-standard and possibly stigmatized feature of this variety, are being increasingly avoided over time by female bilingual speakers.

In order to better understand what kinds of /l/ productions characterize the variation in velarization degrees illustrated in figure 15, all productions of Spanish /l/ (from all speakers) were organized by velarization degree. Figure 16, below, illustrates that the vast

majority of Spanish /l/ productions exhibited velarization degrees ranging from 0.6 to 1.2, comprising the middle of the velarization spectrum. Accordingly, more extreme /l/ productions (or those with considerably lesser or greater velarization degrees) were produced least frequently (or with the least consistency).

Figure 16 - Distribution of Velarization Degrees of Spanish /l/



Synthesizing the information reported in figures 15 and 16, lateral production in CCS (as well as monolingual Madrid Spanish) is predominantly comprised of moderate (or non-extreme) degrees of (non)-velarization, with more extremely velarized or non-velarized tokens being relatively infrequent. This level of dispersion in velarization degrees permits a considerable degree of individual-speaker variation, particularly as mediated by exposure to and usage of Catalan, gender, and age. In order to empirically confirm these effects, however,

we now turn to the results of inferential statistical analyses run on these elicited production data.

4.1.2. Lateral Velarization in Bilingual CCS

We begin by first exploring the laterals produced in the variety of Spanish spoken by bilingual Catalan-Spanish speakers in the BMA, that is, bilingual CCS. In doing so, we can explore the linguistic and social factors that mediate CCS lateral velarization (RQ#2, 3) and assess any trends for possible on-going change within an apparent time construct (RQ#4). Accordingly, we ran a mixed-effects linear regression in R using normed F2 as the dependent variable, testing for fixed effects of four linguistic factors (syllable position [initial vs. final], surrounding segment place of articulation [non-front / velar vs. front / non-velar], Catalan cognate status [greater cognate vs. lesser cognate], and word class [open vs. closed]) and four social factors (Catalan exposure and usage group [group A vs. B vs. C], age [older vs. younger], gender [male vs. female], and style [formal vs. casual]). Interaction terms between Catalan exposure and usage group 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 different speaker groups (e.g. group A vs. group B vs. group C). Individual speaker was included as a random effect in the model.⁷² Additionally, note that since Catalan cognate status and word class could not be fully crossed, as all closed class items were greater Catalan cognates, these two variables were combined into a single factor (cognate status / word class) with three levels: open class greater cognates, closed class greater cognates, and open class lesser cognates.

The results of the linear mixed-effects regression appear below in table 10 (note that

⁷² Among other motivations, including this term as a random factor makes the statistical analysis more conservative (i.e., factors that might come out as statistically significant in a model with only fixed effects [no random effects] may not be statistically significant in a parallel mixed-effects model [with random effects]).

positive β coefficients indicate lesser velarization degrees compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[2,45] = 21.45, p < .0001$), gender ($F[1,39] = 20.74, p < .0001$), style ($F[1,4538] = 13.2, p = .0003$), syllable position ($F[1,4538] = 113.39, p < .0001$), surrounding segment place of articulation ($F[1,4538] = 968.73, p < .0001$), and cognate status / word class ($F[2,4538] = 7.85, p = .0004$). A marginally significant effect of age ($F[1,39] = 3.69, p = .06$) was found, in addition to three significant interaction effects, namely between Catalan exposure group and each of style ($F[2,4538] = 37.57, p < .0001$), syllable position ($F[2,4538] = 43.33, p < .0001$), and surrounding segment place of articulation ($F[2,4538] = 25.67, p < .0001$). 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 10 - Summary of Mixed-Effects Linear Regression Model Fitted to Bilinguals' CCS Laterals

	β	t	p
(Intercept)*	0.7355	25.553	<.0001
Group B	0.107	2.629	0.0117
Group C	0.2649	6.51	<.0001
Younger	0.05758	1.920	0.0622
Male	-0.1322	-4.554	<.0001
Formal	0.02478	3.633	0.0003
Syllable-Initial	0.05825	10.648	<.0001
Non-front / Velar	-0.1704	-31.124	<.0001
Lesser Cognate, Open	0.0303	3.957	<.0001
Greater Cognate, Closed	0.0126	1.939	0.0526
Group B : Formal	-0.00379	-0.39	0.6963
Group C : Formal	0.07104	7.336	<.0001
Group B : Syllable-Initial	0.07222	9.307	<.0001
Group C : Syllable-Initial	0.0346	4.482	<.0001
Group B : Non-front / Velar	-0.04619	-5.94	<.0001
Group C : Non-front / Velar	-0.0498	-6.433	<.0001

*The intercept is group A older females producing greater cognate, open class, syllable-final /l/ adjacent to a front vowel and/or non-velar consonant in casual speech.
The estimated variance of the random effect of speaker is 0.003253.

With respect to the effect of Catalan exposure and use group, post-hoc analyses (with

Bonferonni correction [alpha level = 0.0167]) revealed that velarization degrees significantly differed (and progressively decreased) from group A to group B to group C (for all, $p < .0001$). This confirms that within the bilingual CCS community, velarization degrees are directly influenced by the usage of and exposure to Catalan, constituting clear evidence in favor of the analysis of CCS [ʎ] as contact-induced. Figures 17 and 18 offer a clear visualization of this relationship between CCS /l/ production and Catalan exposure and use.

Figure 17 - Effect of Catalan Exposure and Use Groups on CCS /l/ Velarization - Bar Graph Means

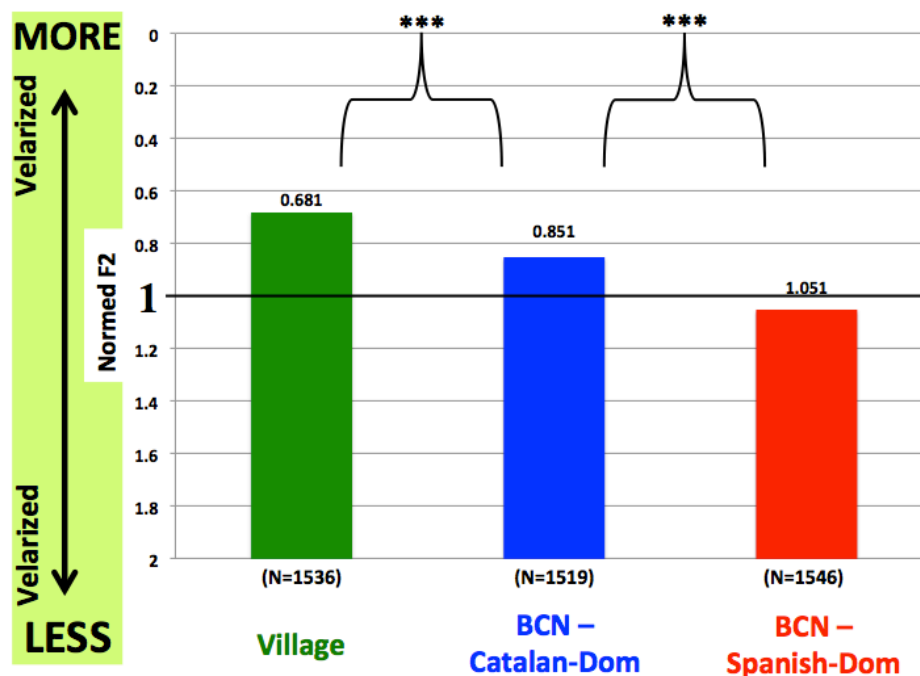
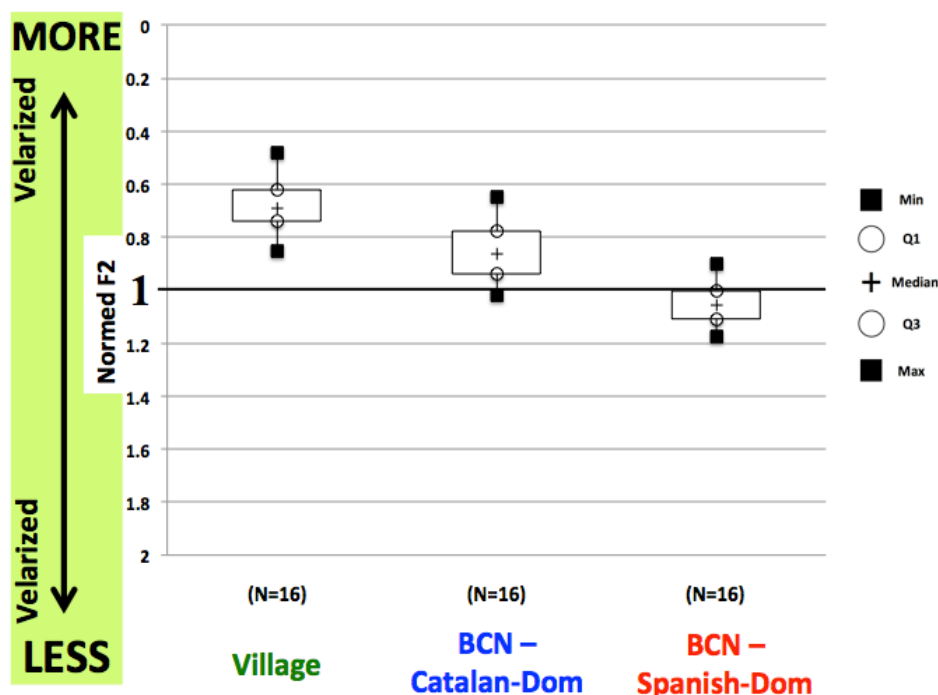
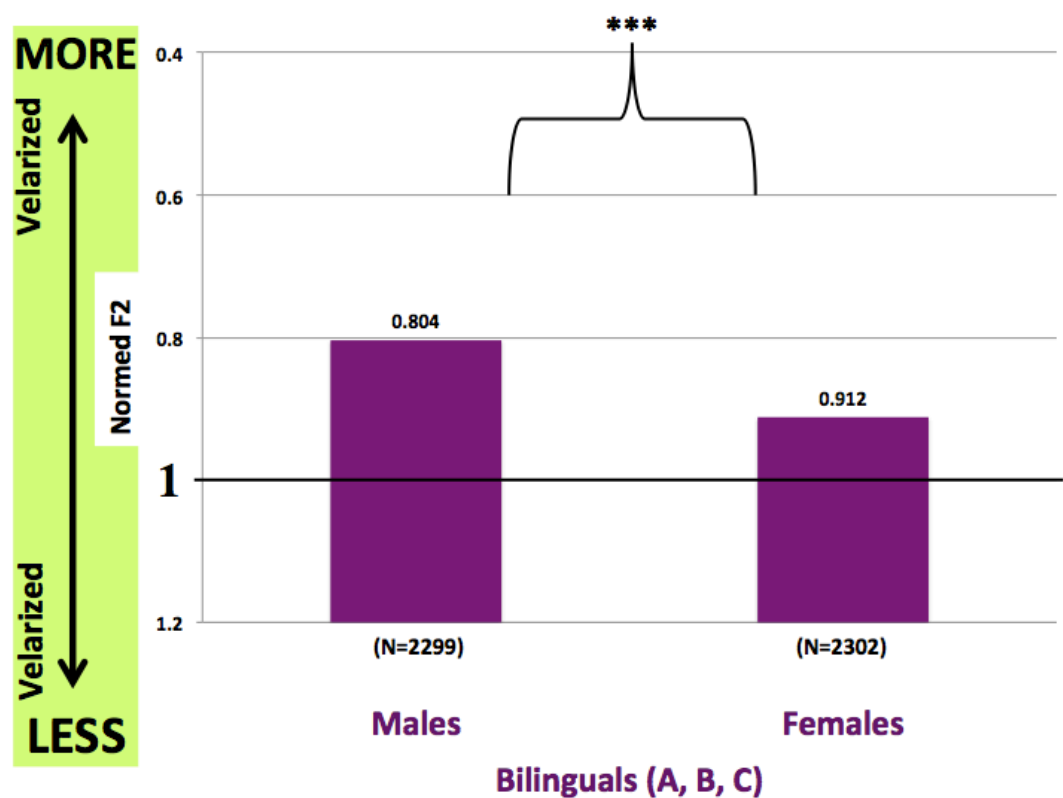


Figure 18 - Effect of Catalan Exposure and Use Groups on CCS /l/ Velarization - Box Plots



With respect to the aforementioned effect of gender on CCS /l/ production, the lack of significant interaction between gender and Catalan exposure and use group confirms that for all three groups of bilingual speakers alike, velarization degrees were significantly greater for males than females. Note that should stronger velarization degrees be in fact stigmatized in Barcelonan CCS, the present finding of stronger velarization degrees in male speech is precisely would what be expected according to the *gender paradox* (cf. Labov 2001). Figure 19 provides a visualization of this effect for the CCS bilinguals.

Figure 19 - Effect of Gender on CCS /l/ Velarization

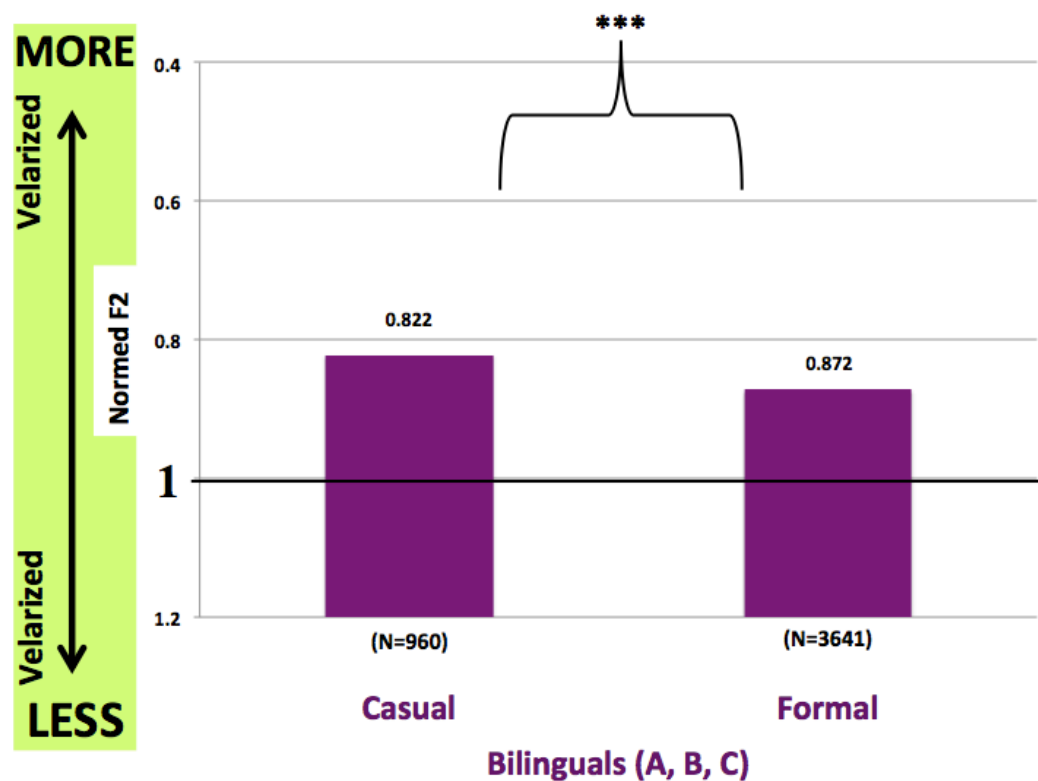


With respect to the aforementioned main effect of style, lateral velarization was stronger in casual speech (i.e., casual interviews) than formal speech (i.e., phrase-list readings). In light of the significant interaction effect between style and Catalan exposure and use group, post-hoc analyses (with Bonferonni correction [α level = 0.0167]) were conducted specifically to test for whether or not the style effect was absent in any one of the exposure and usage groups.⁷³ The post-hoc tests revealed that the style effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater velarization in casual speech). As non-standard variants are expected to occur more frequently in casual speech than in careful, formal speech, this finding is consistent with the analysis of lateral velarization as a non-standard feature in this CCS. Figure 20 offers a clear

⁷³ Individual comparisons between styles across Catalan exposure and use groups (i.e., if velarization was distinct between group A's formal speech and group B's casual speech, etc.) were not of interest. Thus, post-hoc analyses were necessary in order to confirm whether or not the interaction effect reflected a lack of style effect altogether in any of the three groups, a difference in the direction of effect for any of the groups, or if instead it was merely reflective of some kind of asymmetry across individual comparisons (which were not of interest).

visualization of this style effect in the CCS bilingual data.

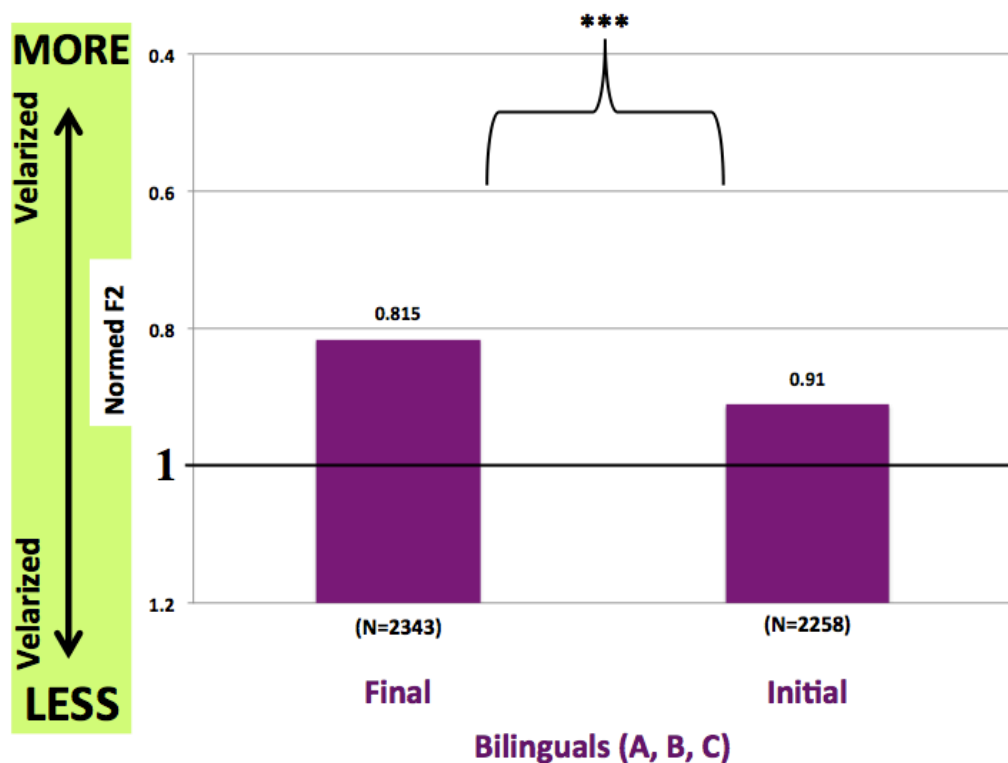
Figure 20 - Effect of Style on CCS /l/ Velarization



With respect to the aforementioned main effect of syllable position, lateral velarization was stronger in syllable-final (coda) contexts than in syllable-initial (onset) contexts. In light of the significant interaction effect between syllable position and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the syllable position effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the syllable position effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater velarization in coda position). Recall that syllable-final velarization is regarded as a common propensity in Romance and Germanic languages (Browman & Goldstein 1995; Recasens 2012; Recasens & Espinosa 1995; Van Hofwegen 2009). Accordingly, the present finding of greater velarization degrees syllable-finally is consistent

with a purely endogenous account of lateral velarization in CCS, pursuant to universal or cross-linguistic propensities shared by many languages, in addition to Spanish. Figure 21 offers a clear visualization of this syllable position effect in the CCS bilingual data.

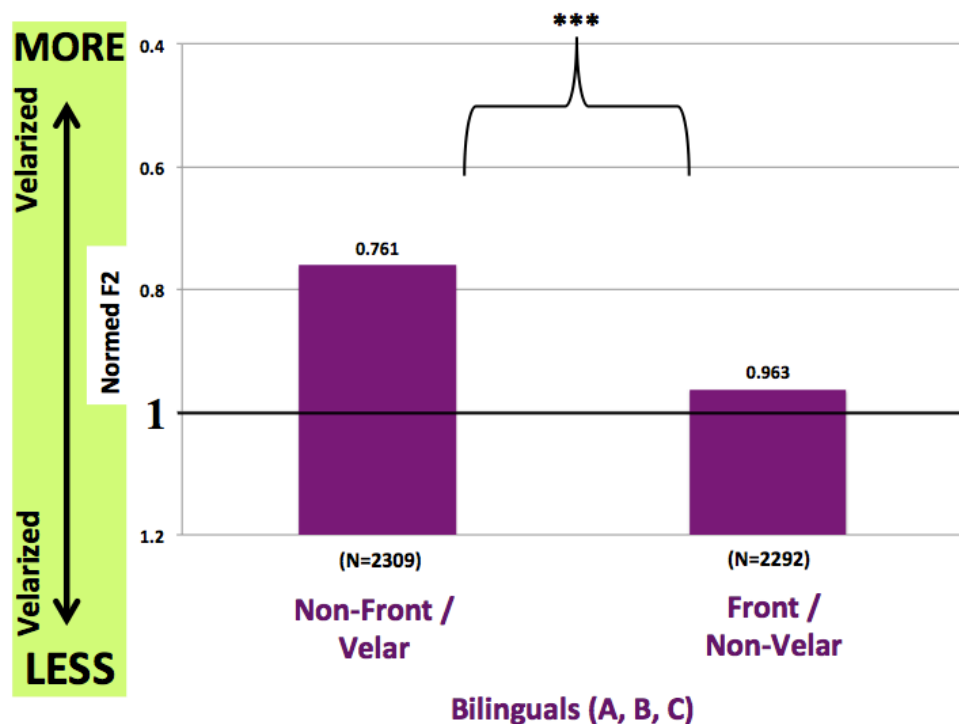
Figure 21 - Effect of Syllable Position on CCS /l/ Velarization



With respect to the aforementioned main effect of surrounding segment place of articulation, lateral velarization was stronger in contexts of an adjacent non-front vowel and/or velar consonant than in contexts of an adjacent front vowel and/or non-velar consonant. In light of the significant interaction effect between surrounding segment place of articulation and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the surrounding segment place of articulation effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the surrounding segment place of articulation effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater

velarization in contexts of an adjacent non-front vowel and/or velar consonant). A coarticulation effect in this direction is predictable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995), and even mirrors the same pattern reported in Catalan for the production of Catalan laterals (cf. Badia i Margarit 1984: 103-104; Casanovas Català 1995: 56; Hualde 1992: 373, 396; Payrató 1985: 108; Prieto 2004: 204; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2004: 594; 2012: 371; 2014a: 20; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37, 47-48; Recasens et al. 1995: 38; Wheeler 2005: 34). Accordingly, the observed coarticulation effect evidences endogenous, cross-linguistic (or universal) mechanisms mediating lateral production in CCS. Figure 22 offers a clear visualization of this surrounding segment place of articulation effect in the CCS bilingual data.

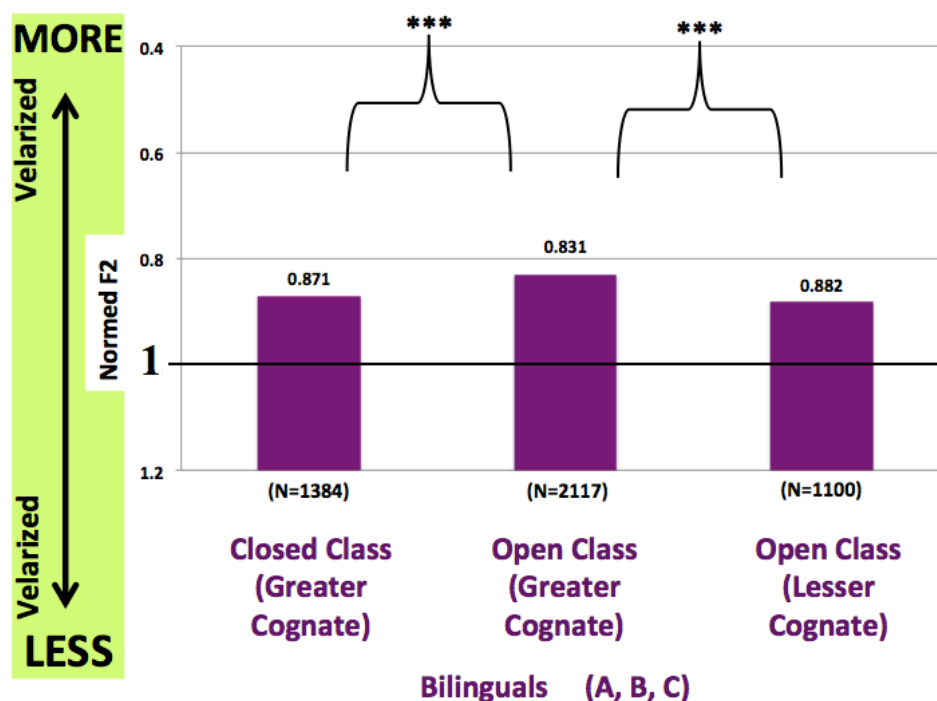
Figure 22 - Effect of Surrounding Segment Place of Articulation on CCS /l/ Velarization



With respect to the aforementioned main effect of Catalan cognate status / word class, a post-

hoc analysis (with Bonferroni correction [α level = 0.0167]) was conducted in order to determine which of the three levels of this factor significantly differed from the others. The post-hoc test revealed that lateral velarization was stronger in greater cognate open class tokens than in lesser cognate open class items ($p < .0001$), suggesting an effect of Catalan cognate status. A cognate effect, of course, constitutes rather direct evidence of language contact. Additionally, greater cognate open class tokens showed significantly greater velarization degrees than greater cognate closed class tokens ($p < .0001$), suggesting an effect of word class (disfavoring velarization in clitics and articles).⁷⁴ Figure 23 below illustrates each of these effects in terms of the post-hoc comparisons from which they are derived, combining the Catalan exposure and usage groups in light of the lack of significant interaction between these groups and Catalan cognate status / word class.

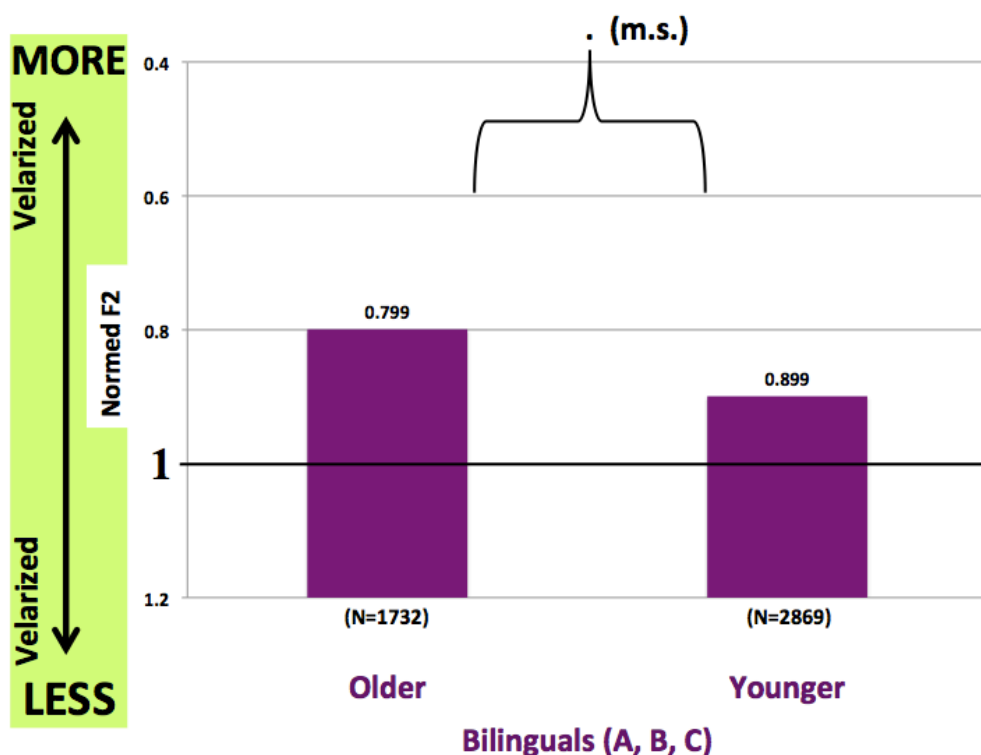
Figure 23 - Effects of Catalan Cognate Status and Word Class on CCS /l/ Velarization



⁷⁴ The comparison between lesser cognate open class tokens and greater cognate closed class tokens revealed no statistical difference in velarization degree ($p = .179$), but since neither Catalan cognate status nor word class can be interpreted independently from this comparison, this result is relatively uninformative.

Finally, with respect to the aforementioned marginal effect of age, lateral velarization was marginally stronger in the speech of the older generation of bilinguals than the younger generation. As this effect did not reach full statistical significance, our interpretation must be cautious. These data can unproblematically be interpreted as suggesting that lateral velarization degrees are not becoming stronger over time, which is consistent with the direction of the aforementioned gender effect, in that females, who would be expected to be the ones to lead such a change (cf. Labov 2001), in fact velarize to a significantly lesser degree than males. Still, since the number of speakers of the older generation was considerably smaller than that of the younger generation, it is possible that with additional subjects in the former group, assuming the trend remains the same, a statistically significant age effect would in fact be found. Figure 24 provides a visualization of this presently marginal effect of age.

Figure 24 - Effect of Age on CCS /l/ Velarization



Summarizing the results presented for the bilingual CCS cohort, a set of both linguistic and social factors has been found to mediate CCS lateral velarization. With respect to linguistic factors, velarization degrees are favored in syllable-final contexts, with greater Catalan cognates, open class words, and in the context of an adjacent non-front vowel and/or velar consonant. As for social factors, stronger degrees of lateral velarization were found with increasing exposure to and use of Catalan (i.e., progressively stronger velarization from group C to B to A), and in male speech, casual speech, as well as marginally in the speech of the older generation of speakers. The combination of gender and marginal age effects, while not presently clear evidence of a linguistic change in progress, would nonetheless be consistent with a (possible) change in progress in which stronger velarization degrees are being weakened over time, led by the younger generation of female speakers. We will return to this analysis upon discussing the results of the matched guise task, which will help to better inform our interpretation of these present data trends. Lastly, note that the aforementioned effects of Catalan cognate status (linguistic) and Catalan exposure and usage group (social) both highlight contact with Catalan as a mediating factor in the emergence and present usage of this feature, whereas the effects of syllable position and surrounding segment place of articulation highlight the linguistic universals also in play. In particular, it is worth highlighting that the finding of a cognate effect for the CCS speakers most directly evidences the influence of Catalan on this Spanish variety more than any other linguistic factor, and thus the status of CCS [ɫ] as contact-induced.

4.1.3. Comparing Laterals in Bilingual CCS to Madrid Spanish Laterals

The production trends previously discussed in section 4.1.2 offer a characterization of Barcelonan CCS in terms of several linguistic and social factors, but cannot speak to how these trends compare with non-contact varieties of Spanish. Accordingly, in this section, we

explore a subset of the Barcelonan elicited production data, namely all data from the younger generation of speakers, and draw comparisons in terms of select linguistic factors with Madrid monolingual Spanish (spoken by a comparably-aged group of younger speakers). These comparisons are necessary to make more definitive claims about the role of language contact in Barcelonan CCS (RQ#6), and permit a quantification of the relative degree of lateral velarization present in modern Barcelonan CCS as compared with a monolingual variety of Spanish (RQ#1). Accordingly, we ran a mixed-effects linear regression in R using normed F2 as the dependent variable, testing for fixed effects of four linguistic factors (syllable position [initial vs. final], surrounding segment place of articulation [non-front / velar vs. front / non-velar], Catalan cognate status [greater cognate vs. lesser cognate], and word class [open vs. closed]) and two social factors (Catalan exposure and usage group [group A vs. B vs. C vs. D] and style [formal vs. casual]).⁷⁵ Interaction terms between Catalan exposure and usage group 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 different speaker groups (e.g. group A vs. group B vs. group C vs. group D). Individual speaker was included as a random effect in the model. Additionally, note that Catalan cognate status and word class were once again combined into a single factor (cognate status / word class) with three levels: open class greater cognates, closed class greater cognates, and open class lesser cognates.

The results of the linear mixed-effects regression appear below in table 11 (note that positive β coefficients indicate lesser velarization degrees compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[3,41] = 68.68, p < .0001$), style ($F[1,3405] = 13.2, p = .005$),

⁷⁵ Since the purpose of these analyses was to examine the linguistic factors operating in Barcelonan CCS in comparison with monolingual Spanish as a means of assessing which were truly independent of contact with Catalan, style and Catalan exposure and use group were the only two social factors entered considered in the statistical model.

syllable position ($F[1,3405] = 65.26, p < .0001$), and surrounding segment place of articulation ($F[1,3405] = 600.99, p < .0001$). Additionally, four significant interaction effects were found, namely between Catalan exposure group and each of style ($F[3,3405] = 17.89, p < .0001$), syllable position ($F[3,3405] = 17.87, p < .0001$), surrounding segment place of articulation ($F[3,3405] = 10.2, p < .0001$), and Catalan cognate status / word class ($F[6,3405] = 2.64, p = .01$). 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 11 - Summary of Mixed-Effects Linear Regression Model Fitted to Younger Speakers' Laterals

	β	t	p
(Intercept)*	0.7288	26.035	<.0001
Group B	0.1757	4.44	<.0001
Group C	0.3436	8.683	<.0001
Group D	0.6249	13.688	<.0001
Formal	0.02465	2.791	0.0053
Syllable-Initial	0.05722	8.079	<.0001
Non-front / Velar	-0.1738	-24.515	<.0001
Lesser Cognate, Open	0.0306	3.092	0.002
Greater Cognate, Closed	0.01335	1.586	0.1128
Group B : Formal	0.006075	0.482	0.6297
Group C : Formal	0.0713	5.689	<.0001
Group D : Formal	-0.02174	-1.495	0.135
Group B : Syllable-Initial	0.07345	7.295	<.0001
Group C : Syllable-Initial	0.03399	3.4	0.0007
Group D : Syllable-Initial	0.04121	3.594	0.0003
Group B : Non-front / Velar	-0.04886	-4.842	<.0001
Group C : Non-front / Velar	-0.04629	-4.621	<.0001
Group D : Non-front / Velar	-0.0396	-3.441	0.0006
Group B : Lesser Cognate / Open Class	-0.00658	-0.47	0.6386
Group C : Lesser Cognate / Open Class	-0.01012	-0.73	0.4653
Group D : Lesser Cognate / Open Class	-0.05153	-3.142	0.0017

Table 11 (cont.)

Group B : Greater Cognate / Closed Class	0.01339	1.112	0.2661
Group C : Greater Cognate / Closed Class	0.00504	0.421	0.674
Group D : Greater Cognate / Closed Class	0.00105	0.077	0.9385

*The intercept is group A speakers producing greater cognate, open class, syllable-final /l/ adjacent to a front vowel and/or non-velar consonant in casual speech. The estimated variance of the random effect of speaker is 0.006782.

With respect to the effect of Catalan exposure group, post-hoc analyses (with Bonferonni correction [alpha level = 0.0083]) revealed that velarization degrees significantly differed (and progressively decreased) from group A to group B to group C to group D (for all, $p < .0001$). This confirms that the velarization degrees present in modern Barcelonan CCS are truly distinct (greater in degree) from monolingual Spanish, and that even Spanish-dominant bilinguals (group C) use laterals with stronger velarization degrees than Spanish monolinguals. Figures 25 and 26 offer a clear visualization of this relationship between Spanish /l/ production and Catalan exposure and use.

Figure 25 - Effect of Catalan Exposure and Use Groups on Spanish /l/ Velarization (Younger Speakers) - Bar Graph Means

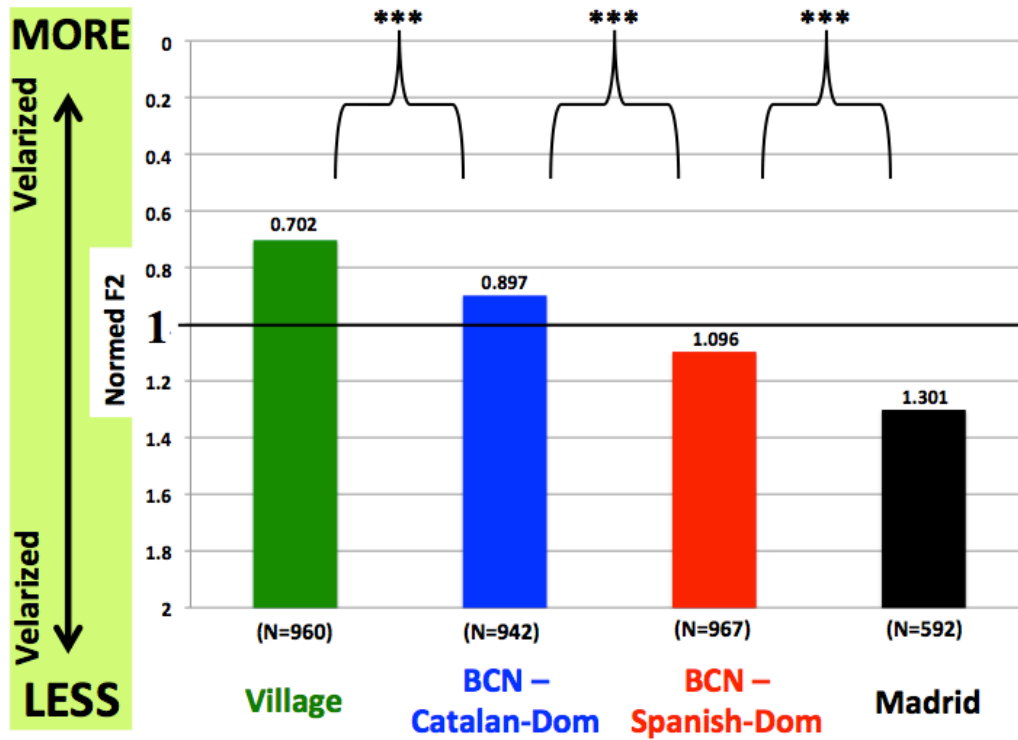
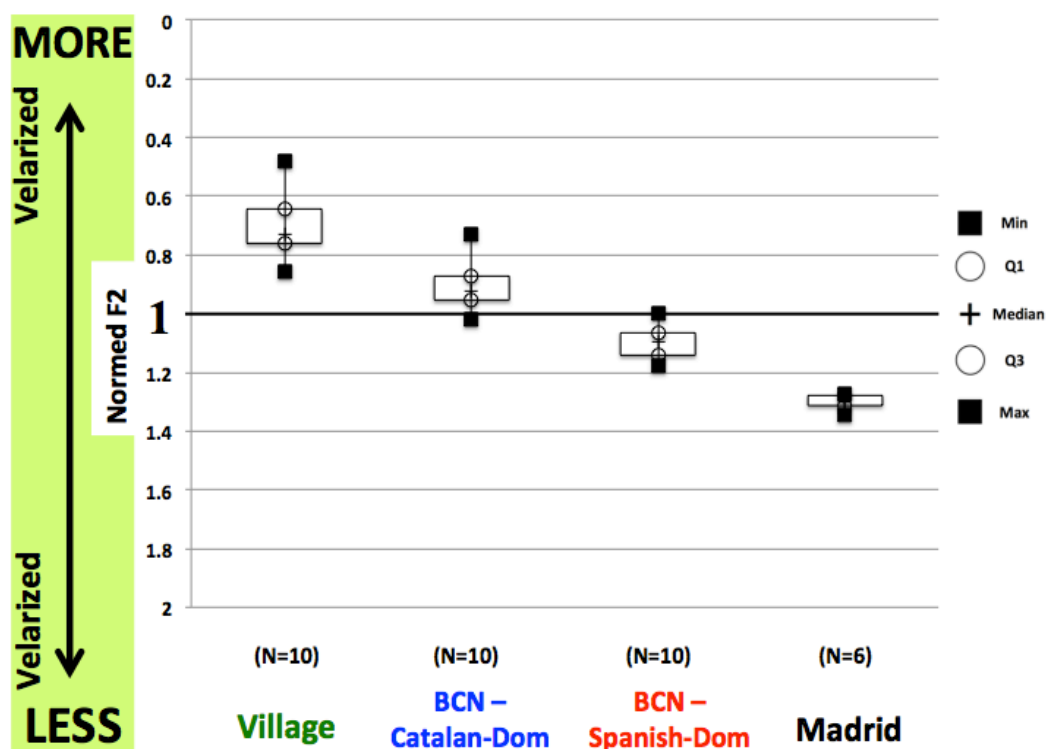


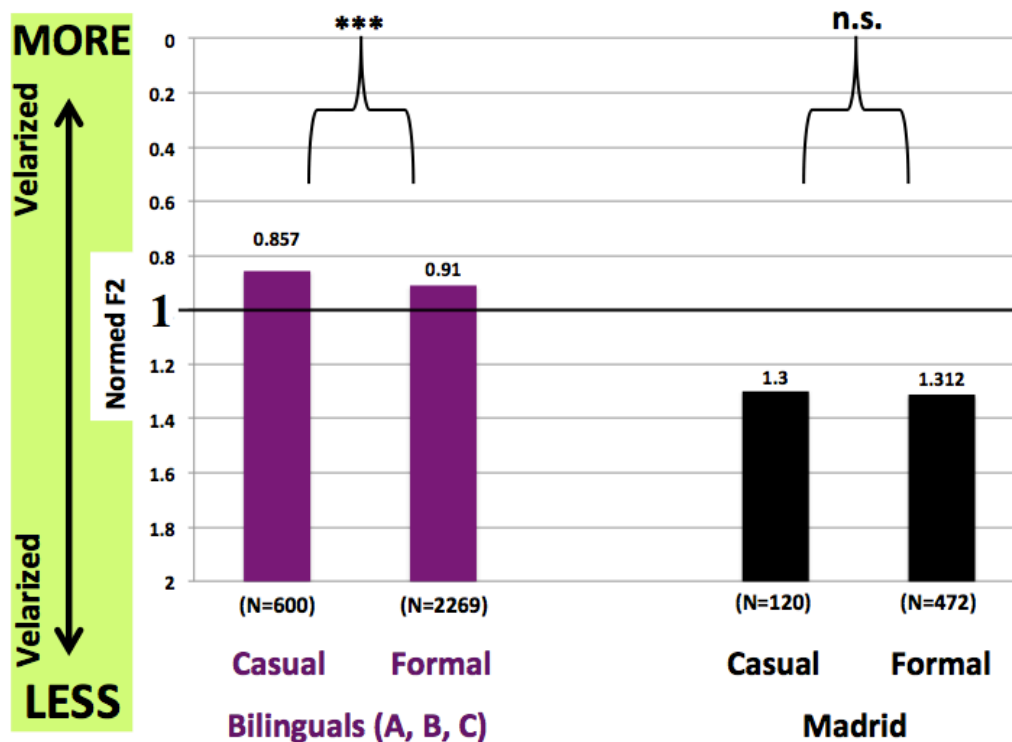
Figure 26 - Effect of Catalan Exposure and Use Groups on Spanish /l/ Velarization (Younger Speakers) - Box Plots



With respect to the aforementioned main effect of style, lateral velarization was stronger in casual speech (i.e., casual interviews) than formal speech (i.e., phrase-list readings). However, post-hoc analyses (with Bonferonni correction [α level = 0.0125]) regarding the significant interaction between style and Catalan exposure and use group revealed that the favoring of greater velarization in casual speech was only significant in the bilingual groups (for all, $p < .0001$). In contrast, there was no significant difference between styles for the Madrid speakers ($p = .801$). Particularly in light of the lack of style effect in monolingual Madrid Spanish, the significant effect of style for bilingual CCS suggests that lateral velarization is indeed a non-standard CCS feature (being less common in careful speech), and, pending confirmation from the matched guise experiment and debriefing interviews of an awareness of lateral velarization and/or overt negative social commentary about the feature, CCS lateral velarization is likely a *linguistic marker* or *stereotype* (cf. Labov 1972; 2001).

That is, it shows social stratification (linked to bilingual CCS speakers and greater exposure and use of Catalan), a style correlate, and may or may not have negative social value. Though we will return to this analysis upon detailing the results of the matched guise experiment, the present findings are sufficient for claiming that CCS lateral velarization is both socially and stylistically marked. Figure 27 offers a visualization of these style trends across the different groups of speakers.

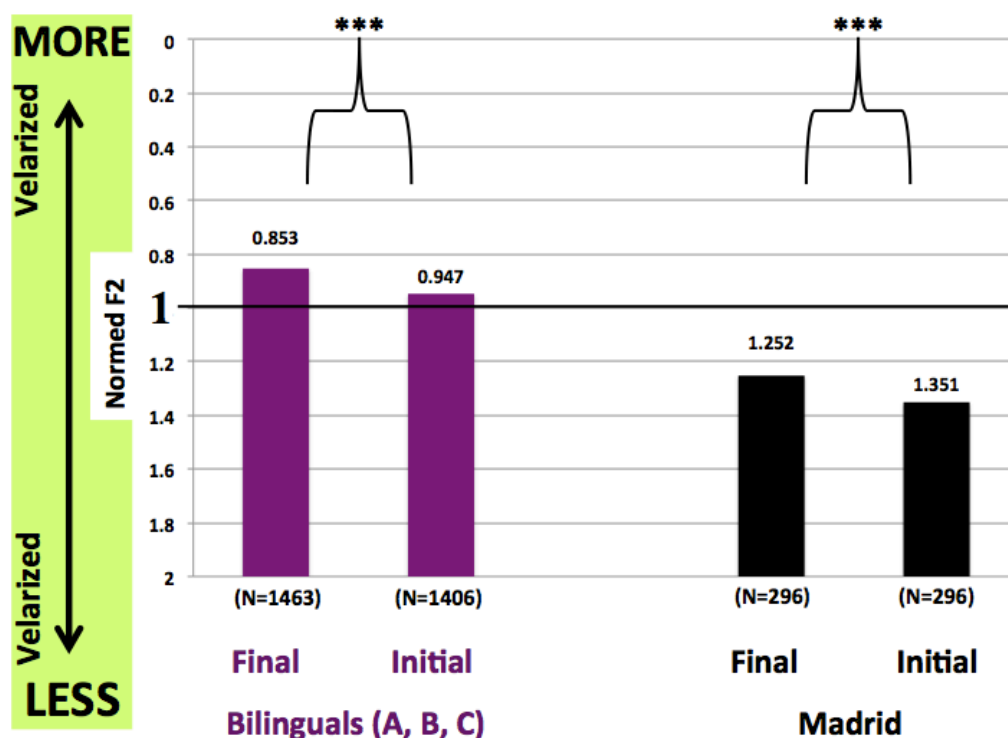
Figure 27 - Effect of Style on Spanish /l/ Velarization (Younger Speakers)



With respect to the aforementioned main effect of syllable position, lateral velarization was stronger in syllable-final (coda) contexts than in syllable-initial (onset) contexts. In light of the significant interaction effect between syllable position and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0125]) were conducted specifically to test for whether or not the syllable position effect was absent in any one of the Catalan exposure and usage groups. The post-hoc tests revealed that the syllable position

effect was in fact present in all four exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater velarization in coda position). As syllable-final velarization is regarded as a common propensity in Romance and Germanic languages (Browman & Goldstein 1995; Recasens 2012; Recasens & Espinosa 1995; Van Hofwegen 2009), the fact that this effect is found in both monolingual and bilingual Spanish varieties constitutes even greater evidence of endogenous (or non-contact-related) nature of this linguistic universal operating in Barcelonan CCS. Figure 28 offers a clear visualization of this syllable position effect in the CCS and Madrid Spanish data.

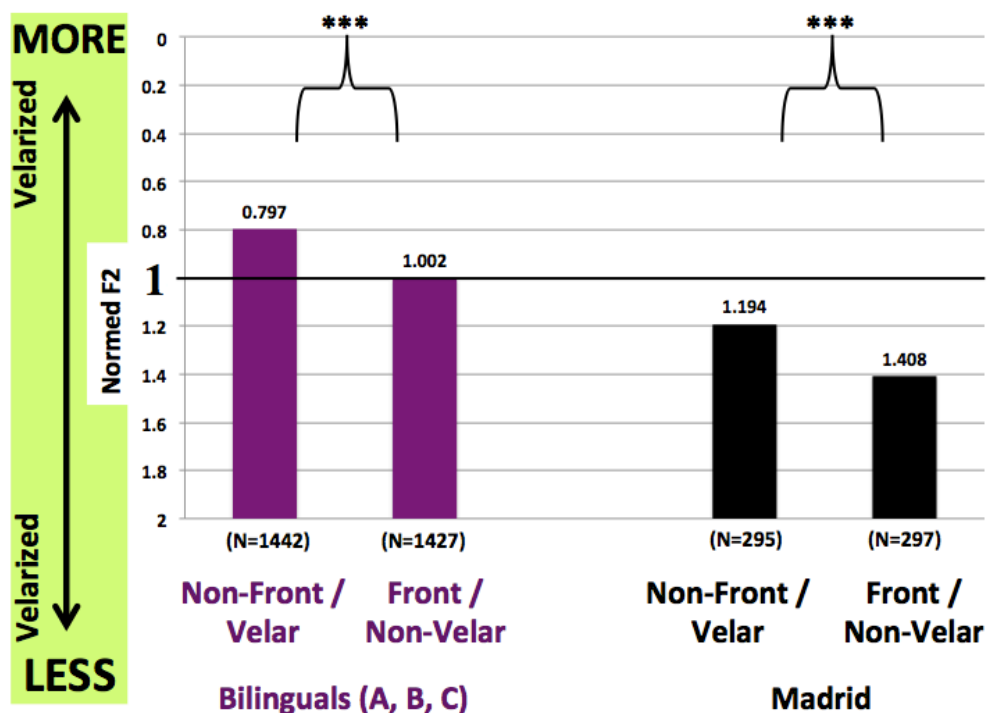
Figure 28 - Effect of Syllable Position on Spanish /l/ Velarization (Younger Speakers)



With respect to the aforementioned main effect of surrounding segment place of articulation, lateral velarization was stronger in contexts of an adjacent non-front vowel and/or velar consonant than in contexts of an adjacent front vowel and/or non-velar consonant. In light of the significant interaction effect between surrounding segment place of articulation and

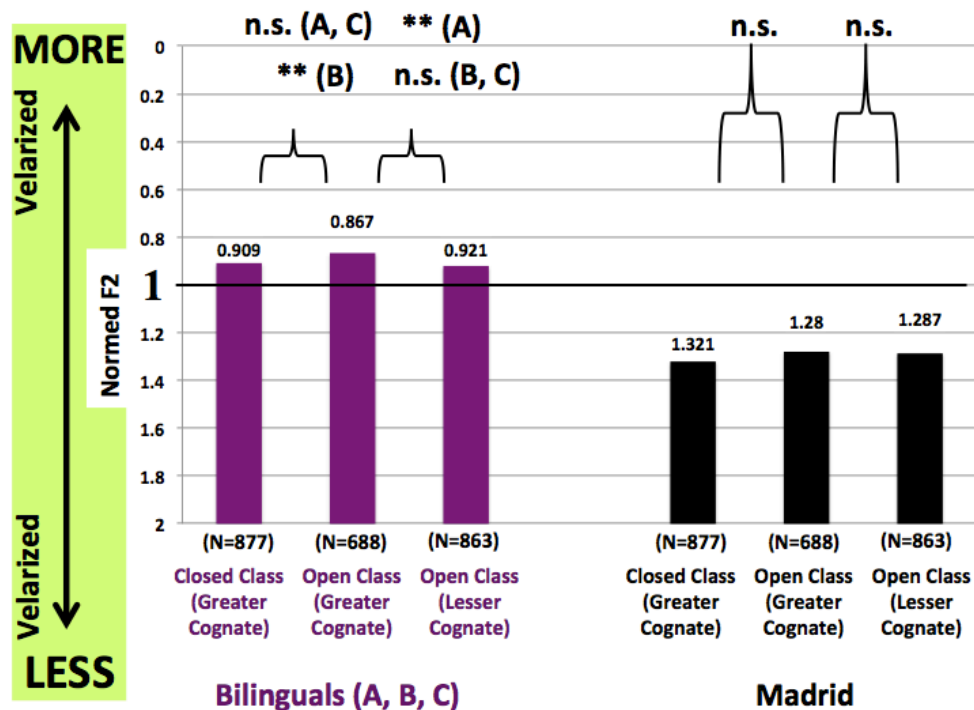
Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [alpha level = 0.0125]) were conducted specifically to test for whether or not the surrounding segment place of articulation effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the surrounding segment place of articulation effect was in fact present in all four exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater velarization in contexts of an adjacent non-front vowel and/or velar consonant). Recall that a coarticulation effect in this direction predictable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995), and thus the fact that this effect is found in both monolingual and bilingual Spanish varieties constitutes even greater evidence of the endogenous (or non-contact-related) nature of this linguistic universal operating in Barcelonan CCS. Figure 29 offers a clear visualization of this surrounding segment place of articulation effect in the CCS and Madrid Spanish data.

Figure 29 - Effect of Surrounding Segment Place of Articulation on Spanish /l/ Velarization (Younger Speakers)



Finally, with respect to the aforementioned main effect of Catalan cognate status / word class and its interaction with Catalan exposure and usage group, a post-hoc analysis (with Bonferroni correction [α level = 0.00625]) was conducted in order to determine which of the three levels of this factor significantly differed from the others, and whether or not these differences varied according to Catalan exposure and usage group. Recall from section 4.1.2 that when a parallel test was run on the entirety of the CCS data (i.e., including both generations of speakers), both a cognate effect and a word class effect were found across the three bilingual groups. Curiously however, the results of the present test are a bit more complicated, likely due to the reduced amount of data entered into the model. Group B showed the expected effect of word class favoring greater velarization in open class words ($p=.002$), but the effect, while in the expected direction, did not reach statistical significance for groups A ($p=.113$), C ($p=.031$), and D ($p=.179$). Since the direction was consistent across all groups, we hypothesize that the reduced number of /l/ productions (since older CCS bilinguals were not included in these analyses) is the cause of the lack of statistical significance. Similarly, with respect to a possible cognate effect, whereas all bilingual groups patterned alike in favoring greater velarization degrees in greater cognate items, the effect only reached statistical significance for group A ($p=.002$) (for group B, $p=.015$; for group C, $p=.035$). Still, the lack of a cognate effect found for group D ($p=.11$) is precisely as expected, and strengthens the case for the role of language contact for this phenomenon. As only bilingual speakers showed sensitivity to the difference between greater and lesser cognates (albeit shy of significance for groups B and C, likely due to the reduced number of /l/ tokens in the analysis), we interpret these findings as indicative of an influence of Catalan on CCS lateral production, precisely absent for the monolingual Madrid speakers. Figure 30 below illustrates each of these effects in terms of the post-hoc comparisons from which they are derived.

Figure 30 - Effects of Catalan Cognate Status and Word Class on /l/ Velarization (Younger Speakers)



Summarizing the results presented for the younger cohort of bilingual and monolingual speakers, select social and linguistic factors have been found to be operating in both CCS and monolingual Spanish, whereas others have been shown to only play a role in Barcelonan CCS. Regarding the former, effects of surrounding segment place of articulation and syllable position present across bilingual and monolingual Spanish varieties suggest that linguistic universals, independent of language contact, most certainly mediate lateral velarization in Barcelonan CCS. In tandem with these endogenous motivations, however, is a set of constraints clearly indicative of Catalan influence (or contact-induced innovation), namely Catalan cognate status and Catalan exposure and use group, which distinguish the usage patterns of lateral velarization in CCS from those in monolingual Madrid Spanish. Notably, velarization degrees in Barcelonan CCS (even for Spanish-dominant bilinguals) are stronger than those present in Madrid Spanish. Moreover, the style correlate present only for Barcelonan CCS further suggests that lateral velarization in Barcelonan CCS is subject to

unique social pressures found in the bilingual territory of the BMA and absent outside of this bilingual territory (i.e., in Madrid).

4.1.4. Dark [ɣ] Production in Bilingual CCS and Madrid Spanish

While the prior analyses in sections 4.1.2 and 4.1.3 are useful for identifying linguistic and social factors mediating CCS lateral velarization, as well as possible language change with respect to changing degrees of velarization over apparent time, the discussion of a concrete innovation and subsequent diffusion of [ɣ] is made somewhat challenging because velarization has been treated as a gradient phenomenon. Accordingly, in order to offer a discussion of the frequency with which a discretely dark, velarized [ɣ] is used in Barcelonan CCS (in comparison with Madrid monolingual Spanish), we have incorporated the velarization data from the Catalan elicited production task as a means of establishing a discrete reference point for [ɣ]. First, in order to verify that velarization degrees are indeed stronger in Catalan than in Spanish, a linear mixed-effects regression was run in R using normed F2 as the dependent variable, testing for a fixed main effect of language (Catalan vs. Spanish), as well as an interaction between language and Catalan exposure and usage group (group A vs. group B vs. group C) to verify that any significant difference in velarization degree between Catalan and Spanish was consistent across the three bilingual groups. Subject was incorporated as a random effect. Note that data entered into this model came from the formal elicited tasks (phrase-list readings) from Spanish and Catalan of all bilingual speakers.

The results of the linear mixed-effects regression appear below in table 12 (note that positive β coefficients indicate lesser velarization degrees compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[2,56] = 24.71, p < .0001$), language ($F[1,4334] = 34.54, p < .0001$), and a significant interaction between the two ($F[2,4334] = 36.57, p < .0001$).

Table 12 - Summary of Mixed-Effects Linear Regression Model Fitted to Spanish & Catalan Laterals

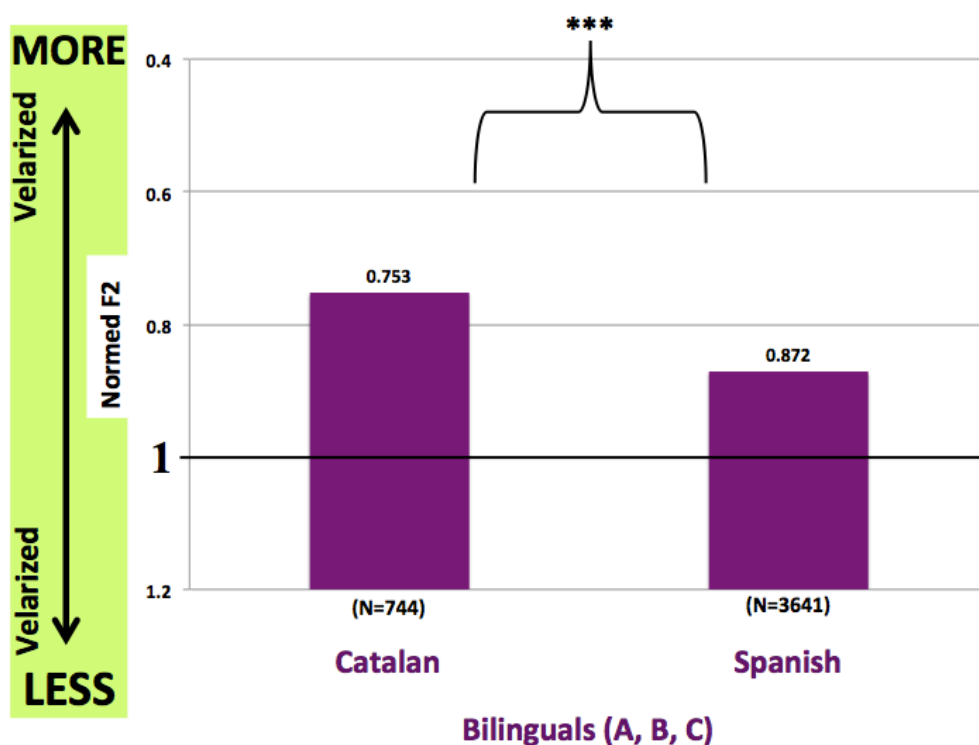
	β	t	p
(Intercept)*	0.6293	23.951	<.0001
Group B	0.1233	3.307	0.00165
Group C	0.2621	7.027	<.0001
Spanish Language	0.05819	5.877	<.0001
Group B : Spanish Language	0.04554	3.177	0.0015
Group C : Spanish Language	0.122	8.495	<.0001

*The intercept is group A speakers producing laterals in Catalan.
The estimated variance of the random effect of speaker is 0.009758.

With respect to the effect of language,⁷⁶ velarization degrees were indeed greater for Catalan laterals than Spanish laterals. In light of the significant interaction effect between language and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [alpha level = 0.0167]) were conducted specifically to test for whether or not the language effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the language effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater velarization in Catalan over Spanish). These findings are visualized below in figure 31.

⁷⁶ The main effect of Catalan exposure and use group revealed that the combined velarization degrees across Spanish and Catalan progressively decreased from group A to group B to group C (for each post-hoc comparison, $p < .0001$ [alpha level = 0.0167]). Since we are precisely interested in velarization degrees in each language separately, this finding is rather uninformative, and accordingly we shall not comment on it further.

Figure 31 - Effect of Language on /l/ Velarization



Having shown that Catalan laterals are indeed significantly darker than Spanish laterals (in line with the experimental findings of several prior studies [cf. Recasens 2012 and sources within; Recasens & Espinosa 2005 and sources within]), we then calculated the average normed F2 value for Catalan laterals produced by the Catalan-dominant bilinguals in groups A and B. This average velarization degree of 0.703 was then treated as the reference value for a ‘Catalan-like’ lateral. Again, since lateral velarization is a gradient phenomenon, rather than propose that all laterals with velarization degrees of 0.703 or lower are intrinsically dark ([ɫ]), we simply are considering that any Spanish lateral produced with a velarization degree of 0.703 or less is *at least* as velarized as the average Catalan lateral, which has been recognized as dark [ɫ] in many prior studies (cf. Badia i Margarit 1984: 103-104; Casanovas Català 1995: 56; Hualde 1992: 373, 396; Payrató 1985: 108; Prieto 2004: 204; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2004: 594; 2012: 371; 2014a: 20; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37, 47-48; Recasens et al. 1995:

38; Wheeler 2005: 34).

With this discrete reference value, we are able to explore the degree of diffusion of a Spanish lateral *at least* as velarized as the typical Catalan lateral across the bilingual groups, as well as compare the frequencies of its use between bilingual CCS and monolingual Madrid Spanish. Accordingly, a Chi-square test was run on the proportion of laterals produced with velarization degrees of 0.703 or lower across the Catalan exposure and use groups. Data for the model came from the younger generation of CCS speakers in order to be maximally comparable to the similarly aged monolingual Spanish speakers from Madrid. The results of the Chi-square test, shown below in table 13 and figures 32 and 33, revealed that the proportion of ‘Catalan-like’ Spanish laterals was not equally distributed across the groups ($\chi^2=717.4067$, $df=3$, $p<.0001$). Post-hoc cell-wise comparisons revealed that a significantly greater proportion of ‘Catalan-like’ laterals were produced by speakers in group A, and significantly smaller proportions of ‘Catalan-like’ laterals were produced by speakers of groups C and D.

Table 13 - Counts of ‘Catalan-like’ Spanish Laterals Produced by Younger Speakers

Catalan Exposure and Use Group	# of ‘Catalan-like’ Laterals	# of non-‘Catalan-like’ Laterals	TOTAL
Group A	368	592	960
Group B	112	830	942
Group C	5	962	967
Group D	0	592	592
TOTAL	485	2976	3461

Figure 32 - Percentages of ‘Catalan-like’ Laterals in Younger Speakers’ Spanish - Bar Graph Means

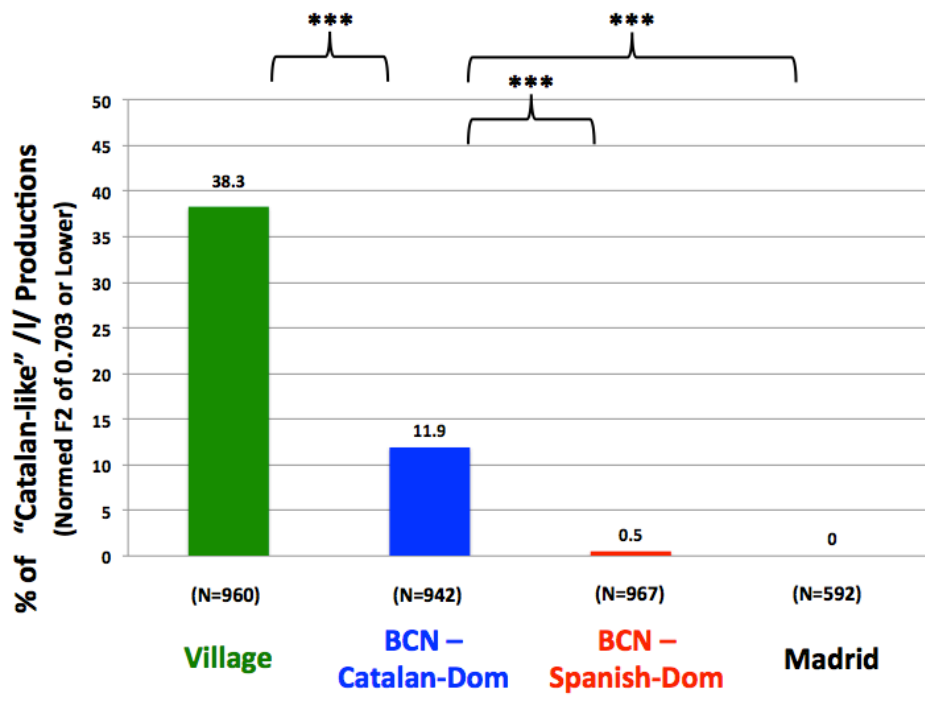
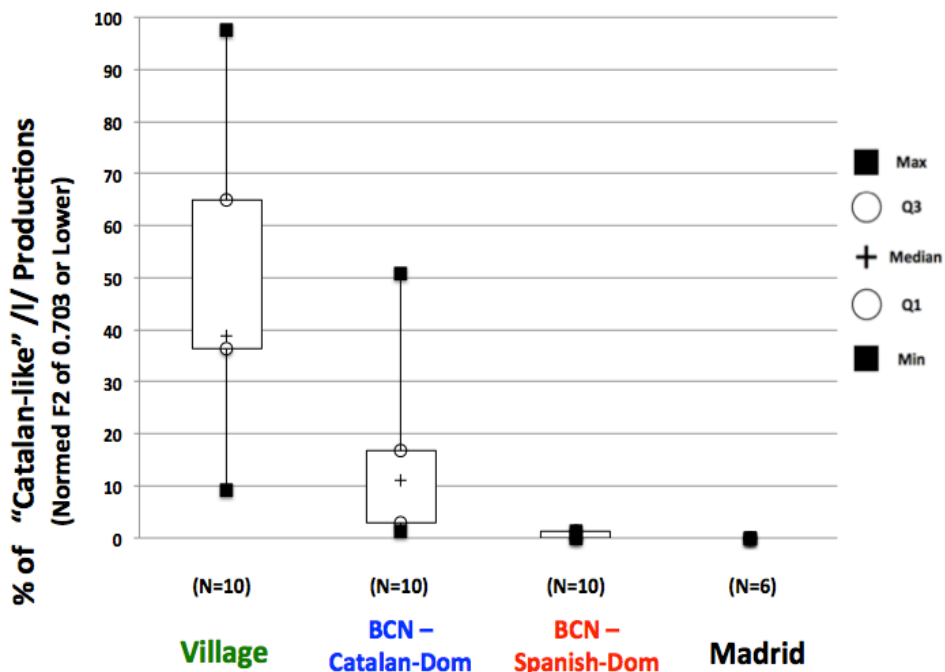


Figure 33 - Percentages of ‘Catalan-like’ Laterals in Younger Speakers’ Spanish - Box Plots



With respect to the degree to which lateral velarization is present in bilingual CCS in

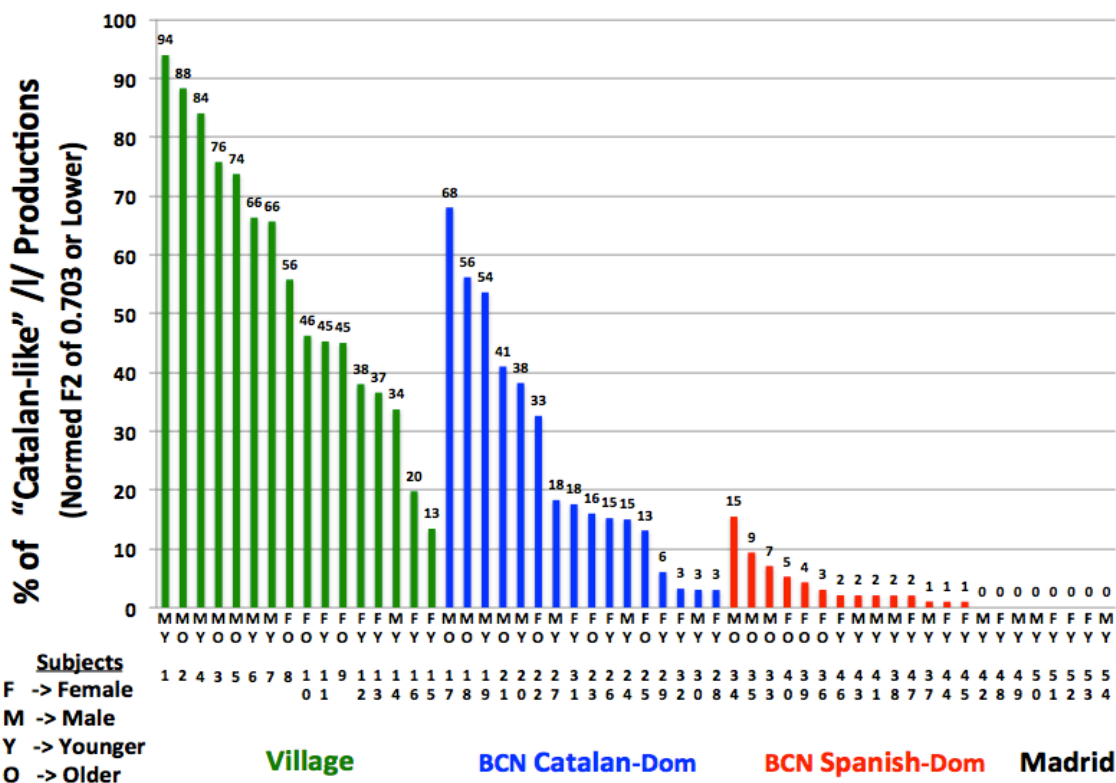
comparison with monolingual Madrid Spanish, our findings suggest that dark [ɫ] (via our proxy of ‘Catalan-like’ laterals) is indeed exclusive to CCS. These laterals do not constitute a majority variant for any of the bilingual speaker groups overall, although for group A speakers, they were produced over a third of time, evidencing [ɫ] as a rather competitive variant in competition with a lighter or more ‘Spanish-like’ lateral [l]. Our data are therefore consistent with the proposal that ‘Catalan-like’ Spanish [ɫ] was innovated by Catalan-dominant bilinguals (especially those from smaller, Catalan-prevalent villages), and continues to mark their Spanish speech. However, these ‘Catalan-like’ laterals do not show evidence of having propagated to any significant degree outside of the bilingual community of Catalan-dominant speakers, as Spanish-dominant bilinguals nearly categorically favor lighter laterals.

In order to more closely examine these group trends, individual frequencies of ‘Catalan-like’ /l/ usage were calculated for each speaker. These frequencies, shown below in figure 34, reveal that while the population of Catalan-dominant bilinguals (groups A and B) includes speakers that use a ‘Catalan-like’ /l/ over 50% of the time (i.e., [ɫ] as a majority variant), the Spanish-dominant groups (groups C and D) do not have a single speaker that uses a ‘Catalan-like’ /l/ as a majority variant. As group A has several speakers that use a ‘Catalan-like’ /l/ nearly categorically, this in turn further suggests that CCS [ɫ] indeed originated in this group of speakers.

Within group A speakers, the ‘Catalan-like’ /l/ shows an extension as a majority variant to half of the village community. Outside of the group A speakers, however, the adoption of a ‘Catalan-like’ /l/ shows a much lesser degree of propagation, with only 3 Catalan-dominant bilinguals (group B) using the variant over 50% of the time, and all Spanish-dominant speakers (groups C and D) either categorically or nearly categorically disfavoring ‘Catalan-like’ /l/s. We will return to this analysis upon discussing the results of

the matched guise experiment and debriefing interviews in the following sections.

Figure 34 - Individual Frequencies of ‘Catalan-like’ Spanish /l/ Production



4.2. Attitudes and Perceptions of CCS Laterals

4.2.1. Covert Attitudes Toward CCS Laterals

The purpose of the matched guise task was to elicit covert attitudes toward light and dark laterals in CCS. The first portion of the matched guise collected scaled responses to the light and dark guises according to solidarity, power, and impressions of how well the speaker speaks Spanish, whether the speaker is from a village, and whether the speaker speaks Catalan. The second portion of the matched guise included non-scaled responses with respect to the age of the speaker, attributes of power and the speaker’s job, the speaker’s knowledge of Catalan, and where the speaker acquired Spanish. Since some of these responses target the same attribute, we shall present the results of the matched guise experiment according to each

targeted attribute, discussing parallels and differences between scaled and non-scaled responses where appropriate. Note that all statistical analyses for scaled responses were performed using z-scores (derived from the raw scores) to normalize responses across the subjects. Figures illustrating the results, however, use raw scores for the sake of easier visual interpretation.

In order to test for differences in solidarity ratings (i.e., if the speaker seemed nice, friendly, and pleasant to listen to), a linear mixed-effects regression was run in R using solidarity score as the dependent variable, testing for a fixed main effect of guise (light guise vs. dark guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in solidarity score between the light and dark guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 14 (note that negative β coefficients indicate lower solidarity ratings [i.e., less nice, less pleasant, less friendly] compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[3,72] = 27.97, p < .0001$), guise ($F[1,50] = 99.37, p < .0001$), and a significant interaction between the two ($F[3,50] = 66.98, p < .0001$).

Table 14 - Summary of Mixed-Effects Linear Regression Model Fitted to /l/ Solidarity Scores

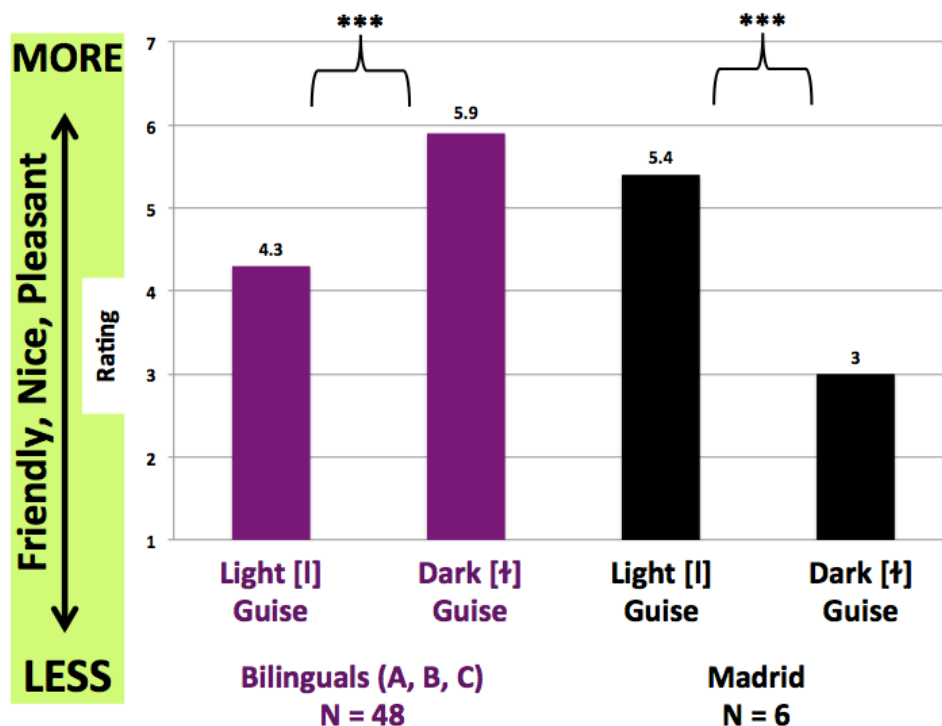
	β	t	p
(Intercept)*	0.8954	6.349	<.0001
Group B	-0.2012	-1.009	0.3165
Group C	-.05263	-2.638	0.0102
Group D	-2.3836	-8.826	<.0001
Light Guise	-1.2073	-9.968	<.0001
Group B : Light Guise	-0.1238	-0.723	0.4731
Group C : Light Guise	0.2786	1.627	0.1101
Group D : Light Guise	2.9821	12.859	<.0001

*The intercept is group A speakers rating the dark guise.
The estimated variance of the random effect of speaker is 0.2009.

As the only statistical comparisons of relevance to our research questions are those concerned

with whether or not each group of speakers differentiated the light and dark guises by solidarity score, we limit our discussion of results to the significant interaction between guise and Catalan exposure and use group. Post-hoc analyses (with Bonferroni correction [alpha level = 0.0125]) revealed that all three bilingual groups (A, B, and C) attributed significantly higher solidarity scores to the dark guise over the light guise (for all, $p < .0001$), whereas the Madrid group uniquely afforded significantly higher solidarity scores to the light guise over the dark guise ($p < .0001$). These findings are visualized below in figure 35.

Figure 35 - Solidarity Score Differences for Light and Dark Guises



In order to test for differences in power ratings (i.e., if the speaker seemed educated and had a high-paying job), a linear mixed-effects regression was run in R using power score as the dependent variable, testing for a fixed main effect of guise (light guise vs. dark guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in power score

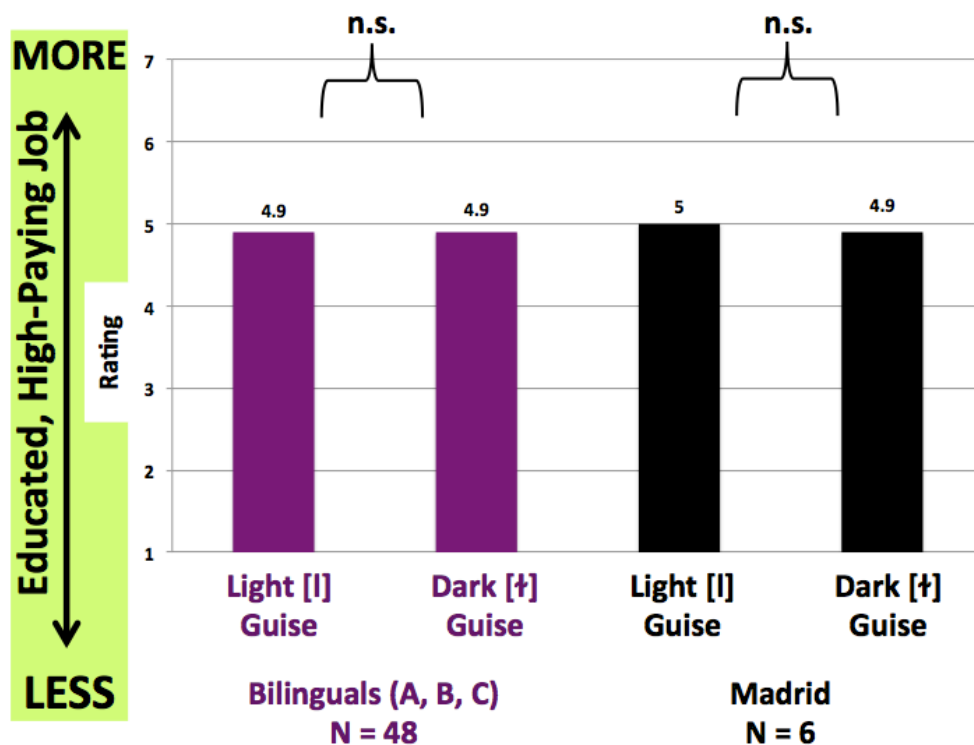
between the light and dark guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 15 (note that negative β coefficients indicate lower power ratings [i.e., less educated, less likely to have a high-paying job] compared to the intercept). The ANOVA table generated from the mixed-effects model returned no significant effects of Catalan exposure group ($F[3,55] = 0.15, p=.93$), guise ($F[1,50] = 0.35, p=.56$) and there was no significant interaction between the two ($F[3,50] = 0.15, p=.93$). These results suggest that light [l] and dark [ɫ] share equal associations with power in CCS, visualized below in figure 36.

Table 15 - Summary of Mixed-Effects Linear Regression Model Fitted to /l/ Power Scores

	β	t	p
(Intercept)*	-.4662	-3.053	0.00349
Group B	0.0986	0.458	0.64863
Group C	-0.03959	-0.183	0.85526
Group D	0.05278	0.18	0.85744
Light Guise	0.03959	0.591	0.55709
Group B : Light Guise	-0.00001	0	1
Group C : Light Guise	-0.01979	-0.209	0.8353
Group D : Light Guise	0.06598	0.515	0.60915

*The intercept is group A speakers rating the dark guise.
The estimated variance of the random effect of speaker is 0.33734.

Figure 36 - Power Score Differences for Light and Dark Guises



Parallel results (i.e. the lack of any significant difference in power attributions between the light and dark guises) were found from the non-scaled power questions on the matched guise questionnaire, namely regarding if the speaker seemed hard-working or lazy, if the speaker seemed rich or poor, if the speaker seemed educated or uneducated, and the kind of job the speaker held (lower class vs. middle class vs. higher class). Note that the option of responding “I don’t know” (or simply not selecting a response) was available for these items, and accordingly the majority of participants chose this option (which isn’t too surprising since the scaled questions revealed no association with power attributes). Chi-square tests run on the proportion responses given for the light guise and dark guise revealed no significant difference in response types across the guises for any of the power items (for hard-working vs. lazy, $\chi^2=0.059$, $df=1$, $p=.808$ [with Yates’ correction]; for rich vs. poor, $\chi^2=0.001$, $df=1$, $p=1$ [with Yates’ correction]; for educated vs. uneducated, $\chi^2=1.978$, $df=1$, $p=.1596$ [with Yates’ correction]; for job type, $\chi^2=1.74$, $df=2$, $p=.41895$). Tables 16, 17, 18, and 19, along

with figure 37 collectively show these parallel findings.⁷⁷

Table 16 - Counts of ‘Hard-working’ vs. ‘Lazy’ Power Responses to Light and Dark Guises

Guise Type	# of ‘Hard-working’ Responses	# of ‘Lazy’ Responses	TOTAL
Light Guise	3	4	7
Dark Guise	4	4	8
TOTAL	7	8	15

Table 17 - Counts of ‘Rich’ vs. ‘Poor’ Power Responses to Light and Dark Guises

Guise Type	# of ‘Rich’ Responses	# of ‘Poor’ Responses	TOTAL
Light Guise	2	1	3
Dark Guise	2	3	5
TOTAL	4	4	8

Table 18 - Counts of ‘Educated’ vs. ‘Uneducated’ Power Responses to Light and Dark Guises

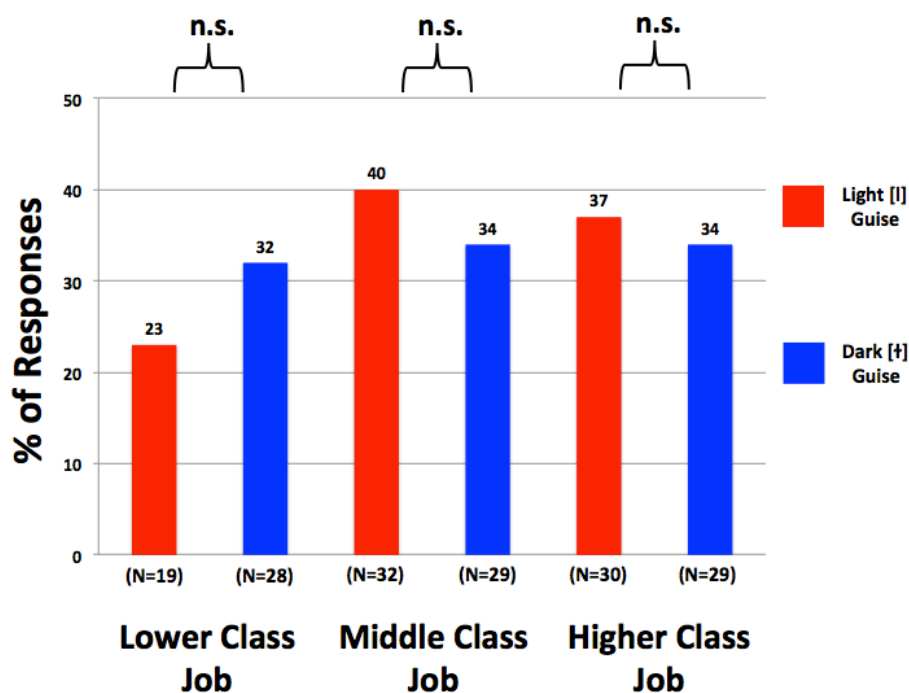
Guise Type	# of ‘Educated’ Responses	# of ‘Uneducated’ Responses	TOTAL
Light Guise	14	0	14
Dark Guise	13	4	17
TOTAL	27	4	31

Table 19 - Counts of Lower, Middle, and Upper Class Job Responses to Light and Dark Guises

Guise Type	# of Lower Class Responses	# of Middle Class Responses	# of Upper Class Responses	TOTAL
Light Guise	19	32	30	81
Dark Guise	28	29	29	86
TOTAL	47	61	59	167

⁷⁷ Visualizations of the data from tables 16, 17, and 18 are not provided due to the relatively low counts (i.e., graphs of these tables would be misleading). Additionally, note for table 19 and figure 37 that there were 3 jobs offered as choices for each of the three job class categories, allowing for a single subject to indicate, per guise, as many as 9 responses.

Figure 37 - Percentages of Lower, Middle, and Upper Class Job Responses to Light and Dark Guises



In order to test for differences in accent ratings (i.e., if the speaker spoke Spanish well and had a pretty accent), a linear mixed-effects regression was run in R using accent score as the dependent variable, testing for a fixed main effect of guise (light guise vs. dark guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in accent score between the light and dark guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 20 (note that negative β coefficients indicate lower accent ratings [i.e., spoke Spanish less well, had a less pretty accent] compared to the intercept). The ANOVA table generated from the mixed-effects model returned a significant main effect of guise ($F[1,50] = 126.87, p < .0001$), such that higher accent ratings (i.e., prettier accent, better spoken Spanish) were attributed to the light guise over the dark guise (independently of Catalan exposure and

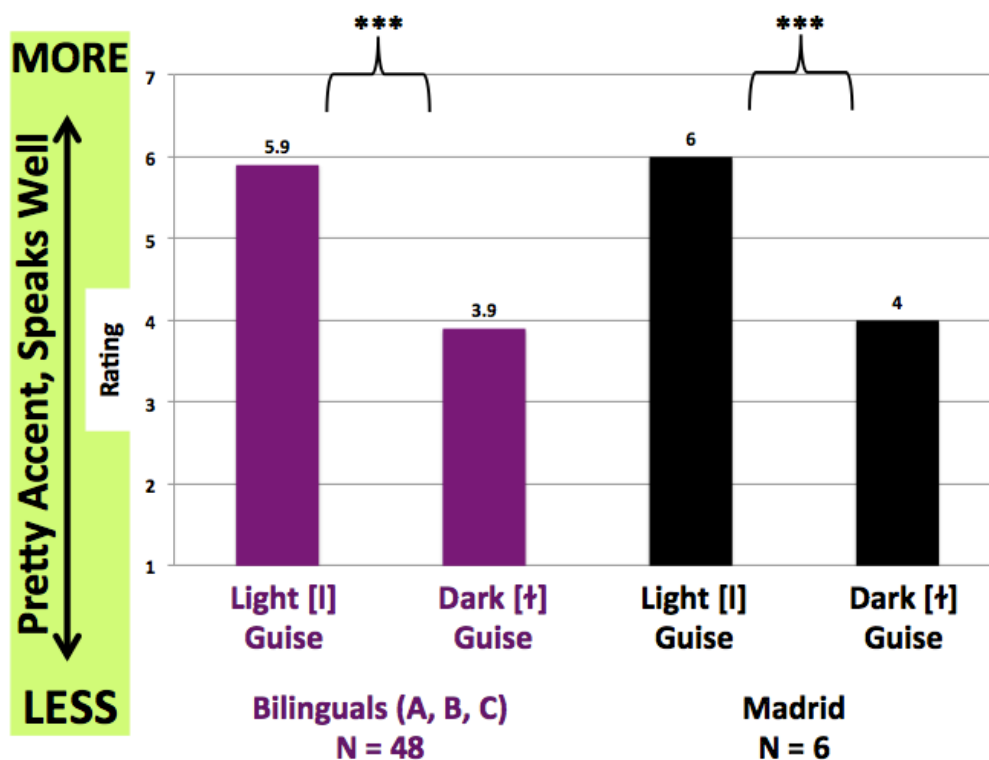
use group).⁷⁸ This finding, consistent with Sinner’s (2002: 165) report of an overt stigma attached to dark [ɫ] as sounding ‘ugly,’ is visualized below in figure 38.

Table 20 - Summary of Mixed-Effects Linear Regression Model Fitted to /l/ Accent Scores

	β	t	p
(Intercept)*	-0.66484	-4.562	<.0001
Group B	0.22415	1.088	0.2805
Group C	-0.05604	-0.272	0.7865
Group D	0.13076	0.469	0.6409
Light Guise	1.34491	11.264	<.0001
Group B : Light Guise	-0.41094	-2.434	0.0186
Group C : Light Guise	-0.01868	-0.111	0.9124
Group D : Light Guise	-0.14943	-0.654	0.5164

*The intercept is group A speakers rating the dark guise.
The estimated variance of the random effect of speaker is 0.2258.

Figure 38 - Accent Score Differences for Light and Dark Guises



In order to test for differences in rurality ratings (i.e., if the speaker seemed to be from a

⁷⁸ No significant effect was found for Catalan exposure and use group ($F[3,69] = 0.72, p=.54$), nor the interaction between guise and Catalan exposure and use group ($F[3,50] = 2.52, p=.07$).

village), a linear mixed-effects regression was run in R using rurality score as the dependent variable, testing for a fixed main effect of guise (light guise vs. dark guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in rurality score between the light and dark guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 21 (note that negative β coefficients indicate higher rurality ratings [i.e., more likely to be from a village] compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[3,86] = 16.37, p < .0001$), guise ($F[1,50] = 150.72, p < .0001$), and a significant interaction between the two ($F[3,50] = 6.23, p = .001$).

Table 21 - Summary of Mixed-Effects Linear Regression Model Fitted to /l/ Rurality Scores

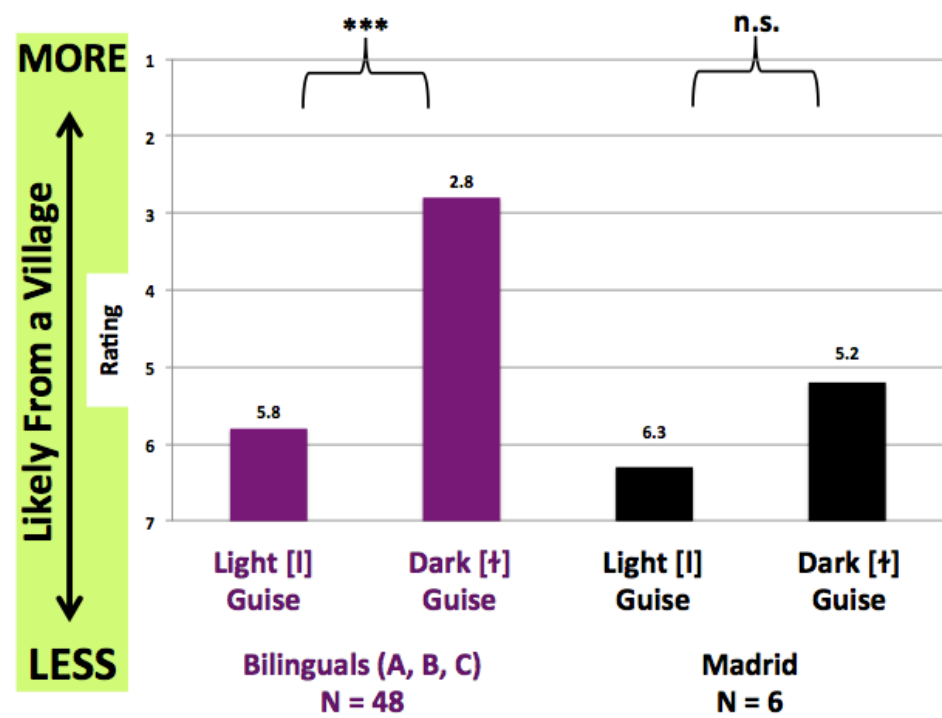
	β	t	p
(Intercept)*	-1.3294	-9.546	<.0001
Group B	0.4341	2.204	0.0302
Group C	0.9015	4.577	<.0001
Group D	1.7251	6.469	<.0001
Light Guise	1.8698	12.277	<.0001
Group B : Light Guise	-0.3673	-1.705	0.0944
Group C : Light Guise	-0.4675	-2.17	0.0348
Group D : Light Guise	-1.2465	-4.274	<.0001

*The intercept is group A speakers rating the dark guise.
The estimated variance of the random effect of speaker is 0.1247.

As the only statistical comparisons of relevance to our research questions are those concerned with whether or not each group of speakers differentiated the light and dark guises by rurality score, we limit our discussion of results to the significant interaction between guise and Catalan exposure and use group. Post-hoc analyses (with Bonferroni correction [alpha level = 0.0125]) revealed that all three bilingual groups (A, B, and C) attributed significantly higher rurality scores to the light guise over the dark guise (for all, $p < .0001$). This effect, while in the same direction, just barely failed to achieve statistical significance for the Madrid group

($p=.015$). This finding, consistent with Sinner’s (2002: 165) report of an overt stigma attached to dark [ɫ] as sounding ‘country-like,’ is visualized below in figure 39.

Figure 39 - Rurality Score Differences for Light and Dark Guises



In order to test for differences in bilingualism ratings (i.e., if the speaker spoke Catalan), a linear mixed-effects regression was run in R using bilingualism score as the dependent variable, testing for a fixed main effect of guise (light guise vs. dark guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in bilingualism score between the light and dark guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 22 (note that negative β coefficients indicate lower accent ratings [i.e., less likely to be a Catalan speaker] compared to the intercept). The ANOVA table generated from the mixed-effects model returned a significant main effect of guise ($F[1,50] = 20.54$, $p<.0001$), such that higher bilingualism ratings (i.e., more likely to be a Catalan speaker)

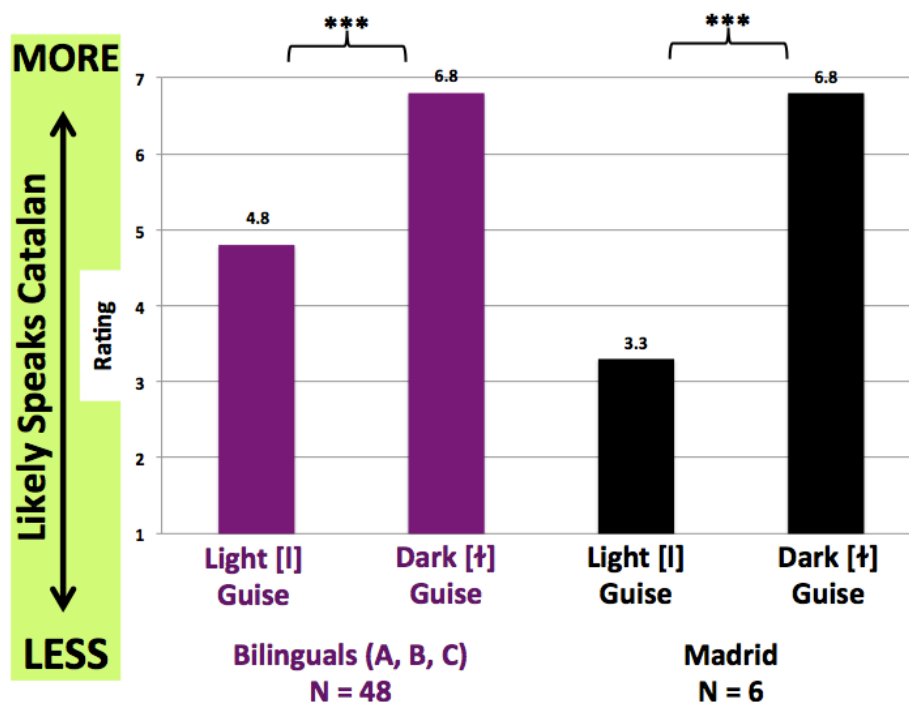
were attributed to the dark guise over the light guise (independently of Catalan exposure and use group).⁷⁹ This finding, evidencing [ɫ]’s status as a salient marker of CCS speech even outside of the CCS community, is visualized below in figure 40.

Table 22 - Summary of Mixed-Effects Linear Regression Model Fitted to /l/ Bilingualism Scores

	β	t	p
(Intercept)*	0.71267	3.606	0.000488
Group B	-0.07127	-0.255	0.799277
Group C	-0.2138	-0.765	0.446143
Group D	-0.09502	-0.251	0.802277
Light Guise	-1.24718	-4.532	<.0001
Group B : Light Guise	0.1069	0.275	0.784689
Group C : Light Guise	0.2138	0.549	0.585195
Group D : Light Guise	-0.74831	-1.42	0.161788

*The intercept is group A speakers rating the dark guise.
The estimated variance of the random effect of speaker is 0.01923.

Figure 40 - Bilingualism Score Differences for Light and Dark Guises



Parallel results (i.e. significant differences in bilingualism attributions between the light and dark guises) were found from the non-scaled bilingualism questions on the matched guise

⁷⁹ No significant effect was found for Catalan exposure and use group ($F[3,100] = 0.2, p=.89$), nor the interaction between guise and Catalan exposure and use group ($F[3,50] = 1.17, p=.33$).

questionnaire, namely if the speaker spoke any other language than Spanish, and where the speaker most likely learned Spanish. Chi-square tests run on the proportion responses given for the light guise and dark guise revealed significant differences in response types across the guises for both of the bilingualism items (for languages spoken beyond Spanish, $\chi^2=25.1345$, $df=1$, $p<.0001$; for location of Spanish acquisition, $\chi^2=15.7262$, $df=1$, $p<.0001$). Post-hoc cell-wise comparisons revealed that a significantly greater proportion of responses of ‘Catalan’ and ‘Catalonia’ (respectively regarding other languages spoken and the region where Spanish was acquired) were attributed to the dark guise over the light guise. Tables 23 and 24 along with figures 41 and 42 collectively show these parallel findings, indicative of the salient status of dark [t] as a marker of CCS.

Table 23 - Counts of ‘Catalan’ vs. ‘None’/Other Bilingualism Responses to Light and Dark Guises

Guise Type	# of ‘Catalan’ Responses	# of ‘None’/Other Responses	TOTAL
Light Guise	25	29	54
Dark Guise	50	4	54
TOTAL	75	33	108

Figure 41 - Percentages of ‘Catalan’ vs. ‘None’/Other Bilingualism Responses to Light and Dark Guises

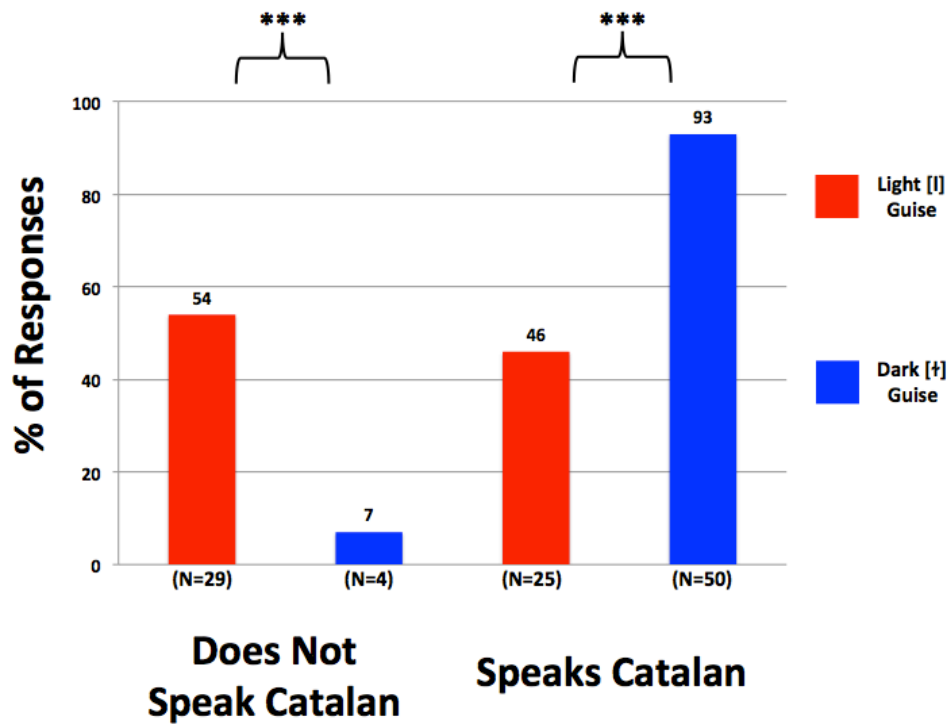
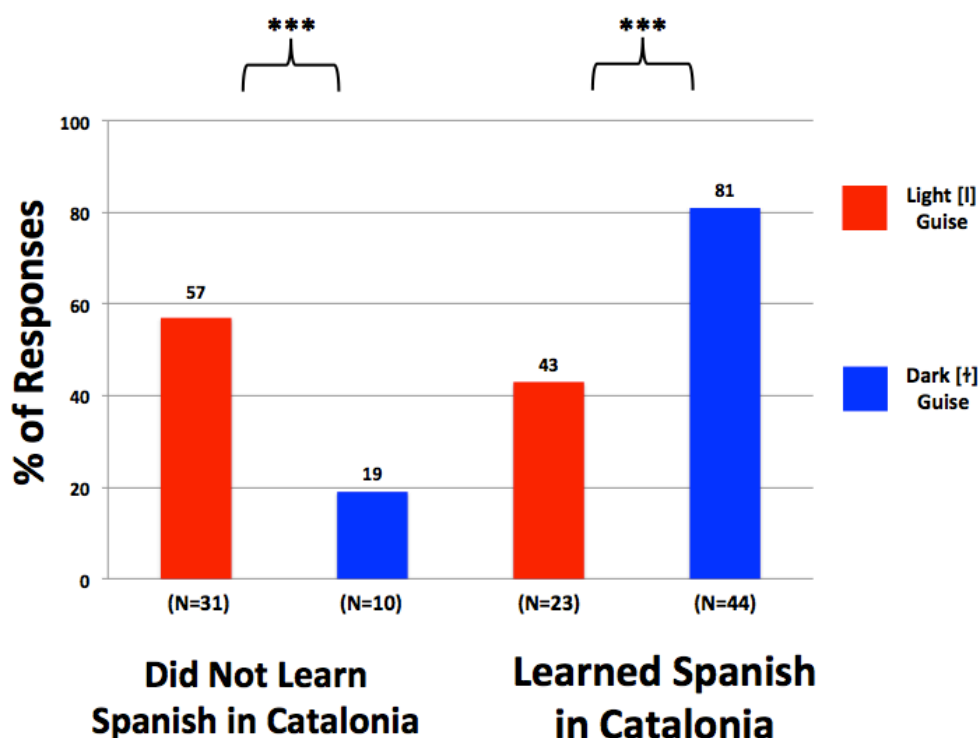


Table 24 - Counts of ‘Catalonia’ vs. Non-Catalan Territory Bilingualism Responses to Light and Dark Guises

Guise Type	# of ‘Catalonia’ Responses	# of Non-Catalan Territory Responses	TOTAL
Light Guise	23	31	54
Dark Guise	44	10	54
TOTAL	67	41	108

Figure 42 - Percentages of ‘Catalonia’ vs. Non-Catalan Territory Bilingualism Responses to Light and Dark Guises



Finally, the remaining two non-scaled items on the matched guise questionnaire both related to the perception of age. The first item asked subjects to estimate the speaker’s age (12-18 vs. 18-25 vs. 25-30 vs. 30s vs. 40+), whereas the second item asked participants to choose whether or not the guise speaks like young people or elderly people (with “I don’t know” as an alternative option). Chi-square tests run on the proportion responses given for the light guise and dark guise revealed no significant difference in response types across the guises for either age-related item (for age estimation, $\chi^2=0.5$, $df=2$, $p=.7788$ [with Yates’ correction]; for young vs. elderly speech, $\chi^2=0.075$, $df=1$, $p=.7842$ [with Yates’ correction]). Note that despite the previously reported marginally significant age effect whereby lateral velarization for CCS speakers was less strong in the younger generation of bilinguals than the older generation, the present matched guise findings suggest that there is no covert awareness of any generational (or age-related) trends regarding dark [ɫ] and light [l] in CCS. Tables 25 and

26, along with figures 43 and 44 collectively visualize these present findings.

Table 25 - Counts of Age Estimation Responses to Light and Dark Guises

Guise Type	# of '12-18' Responses	# of '18-25' Responses	# of '25-30' Responses	# of '30s' Responses	# of '40+' Responses	TOTAL
Light Guise	0	26	28	0	0	54
Dark Guise	0	25	27	2	0	54
TOTAL	0	51	55	2	0	108

Figure 43 - Percentages of Age Estimation Responses to Light and Dark Guises

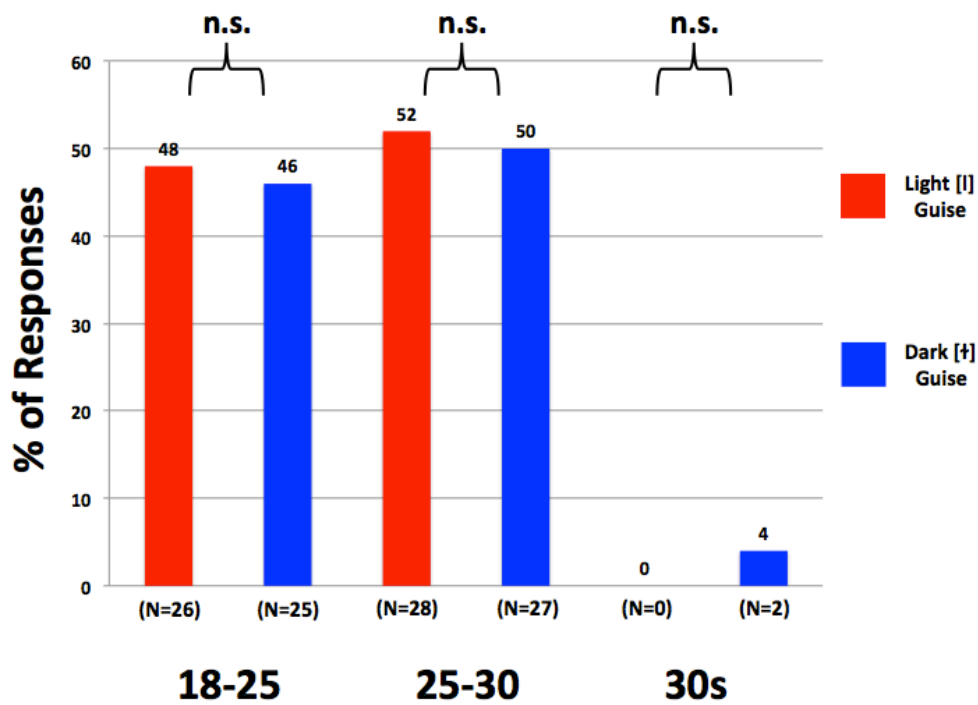
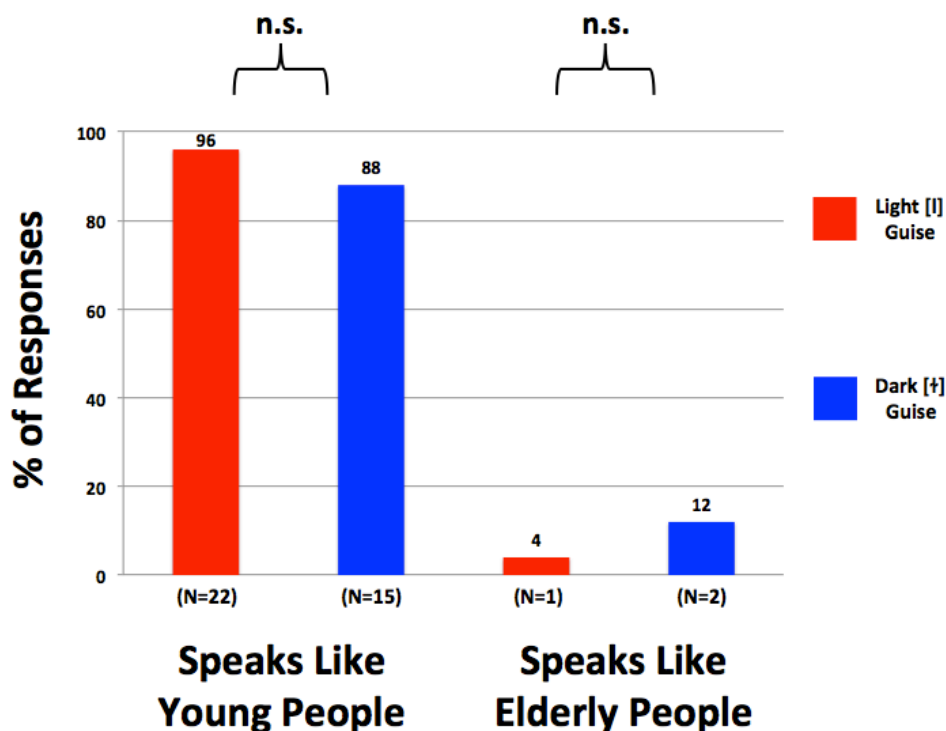


Table 26 - Counts of 'Like Younger People' vs. 'Like Elderly People' Responses to Light and Dark Guises

Guise Type	# of 'Like Younger People' Responses	# of 'Like Elderly People' Responses	TOTAL
Light Guise	22	1	23
Dark Guise	15	2	17
TOTAL	37	3	40

Figure 44 - Percentages of ‘Like Younger People’ vs. ‘Like Elderly People’ Responses to Light and Dark Guises



Summarizing the results of the matched guise experiment with respect to [l] and [ɫ], covert attitudes suggest an interesting paradox in social esteem for CCS lateral velarization on the part of CCS bilinguals. On the one hand, CCS speakers showed an affinity toward the use of [ɫ] when it came to solidarity attributes. On the other hand, all speakers (bilinguals and monolinguals alike) gave higher accent scores to the [l] guise, suggesting that the use of [ɫ] is linked to negative evaluations of less proper or less acceptable Spanish. As all speaker groups showed a covert association of [ɫ] with the bilingual and Catalanian identity of the guise, it can be inferred that the positive solidarity attributes on the part of CCS bilinguals indicate a sense of shared identity with the guise, absent for Madrid speakers. Furthermore, no covert associations with age or power were found. In total, these findings appear congruent with the elicited production trends for lateral velarization. The lack of any significant diffusion of a ‘Catalan-like’ dark lateral outside of the most heavily Catalan-dominant community and the

gender effect disfavoring higher degrees of lateral velarization by females are together consistent with a negative stigma covertly associated with improper Spanish. Nonetheless, even Spanish-dominant bilinguals maintain a degree of lateral velarization that is significantly stronger than that found in Madrid Spanish, which may act as a linguistic resource with which Spanish-dominant bilingual speakers align themselves with the greater bilingual CCS community (cf. Sinner 2002: 162; Vann 2007: 253, 271). We will return to this analysis after reviewing the (overt) attitudes and opinions expressed in the debriefing interviews.

4.2.2. Overt Attitudes Toward CCS and CCS Laterals

The purpose of the debriefing interview was to elicit overt attitudes and opinions toward light and dark laterals in CCS, as well as toward ‘Catalanized’ Spanish more generally.

Additionally, by asking participants to name CCS sound features of which they were aware, information about the most salient markers of CCS could be ascertained. With respect to overt attitudes towards light and dark laterals, the majority of speakers were quick to offer commentary on *la ele catalana* (‘the Catalan /l/’), especially when asked why they thought any of the guises they had just heard were Catalanian. Commentary involving a moot desire to try to avoid using the Catalan /l/ in Spanish for fear of not speaking Spanish well was consistently found in conversations with Catalan-dominant bilinguals, both from Barcelona and from villages. Spanish-dominant bilinguals, on the other hand, while expressing a similar notion of the need to avoid using the Catalan /l/ in Spanish, related this to their own ability to correctly speak Spanish rather than admit any kind of inability to do so. Note that these attitudes are consistent with the covert associations of [ɫ] and incorrect or poor Spanish.⁸⁰

⁸⁰ Though correlations between attitudes and lateral and intervocalic fricative production were not performed, these would be useful to complete in the future so as to draw even stronger connections between language use and attitudes.

- “*Bueno, la ele catalana, sí... yo intento no usarla cuando hablo castellano, porque quiero hablarlo bien, pero bueno, me sale como que me sale* [Well, the Catalan /l/, yes... I try not to use it when I speak Spanish, because I want to speak it well, but well, it comes out how it comes out]” (Subject 12, younger village female);
- “*Mira, supuestamente las eles no las debemos hacer tan catalanas, pero soy catalán y hablo catalán, entonces claro que voy a tener algunos dejes así cuando hablo en castellano, es inevitable* [Look, supposedly we shouldn’t make the /l/s so Catalan-like, but I’m Catalan and I speak Catalan, so of course I’m going to have some accent features like this when I speak in Spanish, it’s inevitable]” (Subject 19, younger BCN Catalan-dominant male);
- “No no, yo no uso la ele catalana cuando hablo castellano. Hablo correctamente y cuando hablo en castellano, uso la ele castellana, y en catalán, pues sólo allí la catalana. [No no, I don’t use the Catalan /l/ when I speak Spanish. I speak correctly and when I speak in Spanish, I use the Spanish /l/, and in Catalan, well only then the Catalan /l/]” (Subject 42, younger BCN Spanish-dominant male).

Curiously, however, a commonly expressed notion across all groups (bilingual and monolingual alike) regarding ‘Catalan-like’ /l/s in Spanish was ambivalence or neutral acceptance:

- “*Si hago las eles muy catalanas, ¿qué más da? Todos aquí hablamos así, es normal* [If I make my /l/s very Catalan-like, what does it matter? Everybody here speaks like this, it’s normal]” (Subject 5, older village male);
- “*La ele catalana, las vocales catalanas, mira - mucho deje puedes tener en tu castellano, pero tampoco no importa mucho, se entiende igual, ¿sabes?* [The Catalan /l/, Catalan vowels, look - you can have a lot of Catalan accent in your Spanish, but it doesn’t matter much, it’s understandable just the same, you know?]” (Subject 20, younger BCN Catalan-dominant male);
- “*Yo no creo que haga las eles así, muy catalanas, pero... no sé, si las hiciera muy catalanas, no importaría mucho. No sé, está bien, no pasa nada* [I don’t think I do the /l/s this way, very Catalan-like, but... I don’t know, if I did them very Catalan-like, it wouldn’t matter much. I don’t know, it’s ok, it’s not anything]” (Subject 44, younger BCN Spanish-dominant female);

- “*No es nada malo, de hecho lo veo bastante natural. Si hablan el catalán como primera lengua, obviamente van a tener la ele catalana en su castellano [It’s nothing bad, in fact I see it as rather natural. If they speak Catalan as a first language, obviously they’re going to have the Catalan /l/ in their Spanish]”*
(Subject 51, Madrid female).

Thus, while many overt attitudes expressed in the debriefing interviews suggested a neutral acceptance of dark [ɫ] in CCS, covert attitudes nonetheless showed that dark [ɫ] retains its negative associations with an improper Spanish accent. Additionally, the aforementioned instances of overt commentary regarding speaking Spanish ‘properly’ by avoiding the Catalan /l/ supports this feature’s classification as a *linguistic stereotype* (cf. Labov 2001), as it marks the speech of bilingual CCS speakers, shows a style correlate, and is the subject of negative overt social commentary. Still, the attested overt ambivalence toward this feature likely contributes to its sustained use (as a majority variant) in the most Catalan-dominant bilinguals. That is, despite a marginally significant age effect whereby lateral velarization decreased from the older to younger generation of CCS bilinguals, the use of a ‘Catalan-like’ /l/ amongst village speakers in particular remains rather high, constituting nearly 40% of their lateral productions (refer back to figure 32 in section 4.1.4).

With respect to attitudes on ‘Catalanized’ Spanish more generally, commentary was commonly positive (i.e., favorable opinions toward the variety) amongst bilingual groups, while once again rather ambivalent for the Madrid speakers. A frequent explanation for why bilinguals felt an affinity toward Catalan-accented Spanish was because it reminded them of the Catalan language and of Catalan speakers. However, within the commentaries of Catalan-dominant speakers, negative commentary involving social ridicule appeared frequently, specifically with respect to an overly ‘Catalanized’ accent.

- “*Bueno, sí, me gusta. Me da un poco de envidia porque se nota que es una persona que habla bien el catalán, y yo no considero que hablo muy bien el*

catalán... pero sí, entre la gente de aquí, está bien visto [Well, yes, I like it. It makes me a little jealous because you can tell it's someone that speaks Catalan well, and I don't believe I speak Catalan very well... but yes, amongst the people from here, it's viewed favorably]" (Subject 38, younger BCN Spanish-dominant male);

- *“Pienso que es de mi país, que es catalán, que es como yo. Claro, es como simpatía, es como patriota. Como persona, me transmite cosas positivas, más que un andaluz, por ejemplo... pero no me gusta que la gente se ría de mi acento súper-catalán* [I think that s/he is from my country, that s/he is Catalan, that s/he is like me. Of course, it's like sympathy, it's like a patriot. As a person, s/he transmits positive things to me, more than an Andalusian, for example... but I don't like that people laugh at my super-Catalan accent]" (Subject 26, younger BCN Catalan-dominant female);
- *“No está mal, es un acento más, es como los andaluces, ¿no? Tienen su acento... pues lo mismo con nosotros, ¿no? Claro, intento que no sea tan exagerado, pero me cuesta. Porque mucha gente, cuando hablo castellano, me lo ha dicho, que tengo mucho acento de catalán, entonces intento que no se note tanto* [It's not bad, it's one accent more, it's like the Andalusians, no? They have their accent... well the same with us, no? Of course, I try to make it not so exaggerated, but it's hard for me. Because a lot of people, when I speak Spanish, have told me so, that I have a strong Catalan accent, so I try to make it so it's not as noticeable]" (Subject 15, younger BCN Spanish-dominant female);
- *“No está mal, simplemente es otro castellano. O sea cada región tiene su acento, ¿no? Aquí en Madrid tenemos nuestro acento, pues allí en Cataluña tienen el suyo, igual que en Andalucía el suyo. No es cuestión de mejor o peor, sino acentos diferentes. Todos son la misma lengua* [It's not bad, it's simply another Spanish. In other words every region has its accent, no? Here in Madrid we have our accent, so there in Catalonia they have theirs, just like in Andalusia theirs. It's not a matter of better or worse, but rather different accents. They're all the same language]" (Subject 50, Madrid male).

The combination of overtly positive affinities toward 'Catalanized' Spanish alongside the admittance of social ridicule for exaggerated or particularly strongly-accented Spanish on the part of CCS bilinguals suggests that there is a certain threshold for the overtly positive esteem of CCS. That is, so long as one's Spanish isn't overly 'Catalanized,' it is not the

subject of negative mockery, and in fact is viewed favorably within the bilingual community (while viewed somewhat neutrally by monolinguals outside the community).

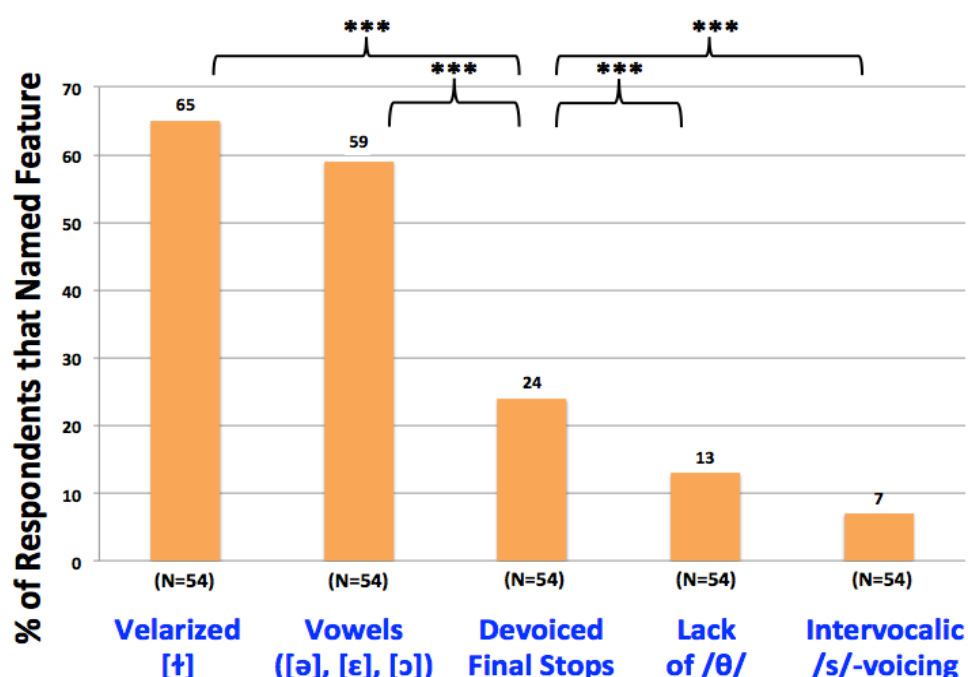
The prior overt commentary on the *ele catalana* as a salient marker of CCS Spanish suggests that this feature may be a principal feature of an overly ‘Catalanized’ accent, contributing to the negative social commentary. In order to better understand what phonetic features likely comprise an overly ‘Catalanized’ variety of Spanish (that is, which features likely push one’s accent over the threshold from being sufficiently ‘Catalanized’ to being too ‘Catalanized’), participants were asked to name all phonetic CCS features of which they were aware. The frequencies with which each feature⁸¹ was named were analyzed as proportions and submitted to a Chi-square test. The results, shown below in table 27 and figure 45, revealed that the proportion of overt awareness was not equally distributed across the named CCS features ($\chi^2=63.555$, $df=4$, $p<.0001$ [with Yates’ correction]). Post-hoc cell-wise comparisons revealed that the proportion of awareness was significantly higher for velarized [ɫ] and Catalan vowels, and significantly lower for the lack of /θ/ and intervocalic /s/-voicing.

Table 27 - Counts of Awareness for Phonetic Features of CCS

Awareness	Velarized [ɫ]	Vowels ([ə], [ɛ], [ɔ])	Devoiced Final Stops	Lack of /θ/	Intervocalic /s/-voicing	TOTAL
Named Feature	35	32	13	7	4	91
Did Not Name Feature	19	22	41	47	50	179
TOTAL	54	54	54	54	54	270

⁸¹ In total, five CCS phonetic features were named, two of which being [ɫ] and intervocalic [z]. Additional features consisted of Catalan vowels (i.e., the use of Catalan vowels foreign to standard Castilian Spanish, such as the neutral vowel [ə] in words like *vaca* ‘cow’ [CCS [bá.kə] vs. standard Castilian [bá.ka]), devoiced final stops (i.e., the application of a Catalan phonotactic devoicing rule in Spanish, such as the production of word-final / ɰ / as [ɰ] in words like *amistad* ‘friendship’ [CCS [a.mis.ɰáɰ] vs. standard Castilian [a.mis.ɰáɰ]), and the absence of the interdental voiceless fricative phoneme /θ/ (foreign to Catalan, such as in words like *zapato* ‘shoe’ [CCS [sa.pá.ɰo] vs. standard Castilian [θa.pá.ɰo]).

Figure 45 - Percentages of Awareness for Phonetic Features of CCS



Since the velarized [ɫ] was the CCS phonetic feature with the greatest overt awareness and was subject to specific, negative social commentary, we propose that [ɫ] is one of the features of CCS that is associated with overly or exaggeratedly ‘Catalanized’ Spanish. This interpretation is consistent with the findings reported by Sinner (2002), in which velarized /l/ was the only CCS feature to be overly named by both CCS bilinguals and monolingual Spanish speakers from Madrid. Accordingly, the opinions and attitudes expressed during the debriefing interviews suggest that CCS as a variety in general is not subject to overt negative social commentary, and in fact is a source of positive solidarity and esteem for bilingual Catalan-Spanish speakers. However, overt negative stigmas exist for the *ele catalana* and an overly ‘Catalanized’ variety of CCS, which most likely is marked by the use of [ɫ], amongst other features.

4.3. Summary of Lateral Velarization Results

In this chapter, we have presented findings from the elicited production tasks in Spanish and

Catalan, as well as those from the matched guise and debriefing interviews with respect to lateral velarization in CCS. To best synthesize these results, we shall offer summary conclusions regarding each of the proposed research questions concerning lateral velarization.

RQ1: To what extent is lateral velarization present in modern Barcelonan CCS (as compared with non-contact, monolingual Spanish varieties)?

A comparison of velarization degrees between CCS bilinguals and Madrid monolingual speakers of Spanish revealed that a significantly stronger degree of lateral velarization was found for all bilingual speakers, including Spanish-dominant bilinguals from Barcelona. These stronger degrees of velarization, though mediated by exposure and usage of Catalan, suggest that Spanish laterals in Barcelona are plainly distinct from laterals in Madrid Spanish, offering evidence in support of the classification of lateral velarization in CCS as a contact innovation. These findings run parallel with those reported for the CCS of Palma de Majorca by Pieras (1999: 236-237) and Simonet (2008: 306), who both found greater degrees of lateral velarization with increased dominance in Catalan.

Wesch (1997: 296, 298) reported that velarized CCS [ɫ] productions were least frequent in the younger generation of Barcelona bilinguals, suggesting that perhaps [ɫ] would become less frequent as time passed. The present data, collected 15 years later, evidenced a marginal age effect in the same direction, with younger bilingual speakers using less strongly velarized /l/ productions than older bilinguals. However, when examining the discrete frequencies with which ‘Catalan-like’ production of CCS /l/ were produced, the present data show that that the younger generation of CCS bilinguals on average produce ‘Catalan-like’ laterals roughly 23% of the time. For younger village speakers, ‘Catalan-like’ laterals were produced nearly 40% of the time, and nearly half of all younger village speakers (four of ten) used a ‘Catalan-like’ /l/ as a majority variant with a usage frequency ranging from 56% to

94%. Thus, despite the aforementioned marginal effect of age, we may conclude that dark laterals remain a considerably frequent feature of CCS within the village community of Catalan-dominant bilinguals. Notably, since the majority of experimental items from the elicited production tasks came from the formal speech phrase-list readings, it is also important to consider that these high frequencies of ‘Catalan-like’ /l/ production were produced for most part in careful speech, suggesting that ‘Catalan-like’ /l/s form a substantial part of the formal speech register and are not limited to casual speech.

In Barcelona, however, only one (Catalan-dominant) younger speaker produced ‘Catalan-like’ laterals (which recall were those laterals with normed F2 values of 0.703 [i.e., the average normed F2 for Catalan laterals produced by Catalan-dominant bilinguals] or lower) as a majority variant (at a rate of 54%). The rest, depending on dominance, generally used ‘Catalan-like’ laterals either between 13% and 18% of the time (Catalan-dominant) or between 0% and 2% of the time (Spanish-dominant). Thus, in terms of strictly ‘Catalan-like’ laterals, the present data suggest that within Barcelona, this feature is relatively infrequent, especially amongst the Spanish-dominant population. However, since velarization degrees in Barcelonan CCS were significantly stronger than those of Madrid Spanish, the laterals produced by Barcelonan speakers, while not as velarized as those used in village communities, nevertheless can be considered velarized, simply to a lesser degree that can be considered characteristic of a more urban variety of CCS.⁸² Thus, it seems most reasonable to conclude that lateral velarization remains a frequent feature in Barcelonan CCS, as it continues to distinguish bilingual speakers’ Spanish from that of Madrid. However, as the degree of velarization is considerably lesser in Barcelona than in smaller, more rural villages on the outskirts of the BMA, it must be clarified that more extremely velarized /l/

⁸² Future perception research would benefit from exploring perceptual thresholds of CCS lateral velarization. In other words, it would be of great interest to see if laterals produced by Spanish-dominant bilinguals were perceived as ‘Catalan-like’ by CCS bilinguals and monolinguals outside of Catalonia, in addition to determining at what precise velarization degree laterals are perceived as ‘Catalan-like’ more generally.

productions are only used with considerable frequency (as a majority variant) in smaller villages outside of the region's capital.

RQ2: What are the social (language-external) constraints affecting lateral velarization in Barcelonan CCS?

Lateral velarization was found to be mediated by a series of social factors in Barcelonan CCS, including Catalan exposure and use group, gender, style, and (marginally) age. As mentioned earlier, the effect of Catalan exposure and use group directly evidences the influence that contact with Catalan has on the production of laterals in the Spanish of bilingual speakers, and parallels the findings of increased degrees of velarization for Catalan-dominant bilinguals for the CCS of Palma de Majorca (cf. Pieras 1999: 236-237; Simonet 2008: 306).

Regarding an effect of gender, all bilingual groups exhibited a disfavoring of greater velarization degrees on the part of females in comparison with males. Following the *gender paradox* (cf. Labov 2001), females are expected to use standard features more when they are overtly proscribed. The various comments (of both genders) from the debriefing interviews regarding the overt stigma associated with heavily-accented CCS and dark [ɫ] in particular suggest the existence of a proscribed norm in the bilingual community that disfavors CCS [ɫ], and accordingly we interpret the gender effect evidenced in our data as suggesting that female speakers may be avoiding the use of an overtly stigmatized feature. This interpretation is furthermore corroborated by the style effect evidenced for all bilingual speakers, in that greater degrees of lateral velarization were used less in careful speech. The covert and overt attitudes concerning the use of CCS [ɫ] as improper Spanish suggest that speakers effectively reduce their velarization degrees when attempting to speak more carefully, validating the interpretation of the gender and style effects as indicative of an avoidance of [ɫ] as a *linguistic stereotype* (cf. Labov 1972; 2001).

This behavior parallels the gender effect reported for the CCS of Palma de Majorca

by Pieras (1999: 235, 238, 240) and Simonet (2008: 308), who found that females used fewer velarized CCS laterals than males in response to an overt social stigma attributed to [ɫ] as linked to rurality, old age, and lower social class. Despite the parallel gender and age effects, however, the dynamics of lateral velarization between the communities of the BMA and Palma de Majorca may in fact be rather distinct. Recall that laterals in Balearic Catalan are claimed to be darker than laterals in Barcelonan (or more generally, Central) Catalan (Recasens 2014a: 20). These greater velarization degrees of laterals in the Balearic bilingual community may be responsible for a seemingly more extreme absence of CCS [ɫ] production in Palma de Majorca than in the BMA. Pieras (1999: 238) finds that not a single Catalan-dominant speaker born after 1960 used CCS [ɫ], whereas all speakers born before 1960 used CCS [ɫ]. In contrast, in the present BMA data, all bilinguals older and younger, including the Spanish-dominant bilinguals from Barcelona, used some degree of ‘Catalan-like’ laterals. Moreover, recall that CCS [ɫ] was not covertly associated with power attributes (such as lower social class) by Barcelonan bilinguals. Thus, it seems to be the case that the stigma associated with CCS [ɫ] is (or at least was) considerably greater in Palma de Majorca than it is in the BMA, and this might be linked to the naturally lesser degree of velarization that characterizes Barcelonan Catalan (and Barcelonan CCS) in comparison with Balearic Catalan (and Balearic CCS). Moreover, the surprising strong (or categorical) age effect noted by Pieras (1999) for Palma de Majorca stands in stark contrast to the marginal age effect found for the present BMA data, as ‘Catalan-like’ laterals continue to be used as majority variants by a considerable portion Catalan-dominant speakers in the BMA.

RQ3: What are the linguistic (language-internal) constraints affecting lateral velarization in Barcelonan CCS?

Lateral velarization was found to be mediated by a series of linguistic factors in Barcelonan CCS, including syllable position, word class, Catalan cognate status, and surrounding

segment place of articulation. With respect to syllable position, lateral velarization was stronger in syllable-final (coda) contexts than syllable-initial (onset) contexts. This effect was present for all bilingual speaker groups, in addition to the monolingual Spanish speakers from Madrid, indicating that this effect is most reasonably interpretable as an endogenous motivation, independent of contact with Catalan. To this end, recall that Romance and Germanic languages are posited to exhibit a natural tendency toward syllable-final velarization (cf. Allen 1989: 33; Badia i Margarit 1984: 199; Grandgent 1991: 185-187; Niedermann 1953: 9; Pieras 1999: 242; Rasico 1981: 200; Recasens 1996; 2014a: 20-21), and thus the present findings offer further support for this claim for Romance.

With respect to word class, all bilingual groups exhibited greater velarization degrees with open class words (e.g. nouns) than closed class words (e.g. clitics and determiners). Although the direction of this effect is opposite of that reported in Davidson (2012), the relatively large degree of imbalance in closed and open class items used in that pilot experiment raised caution regarding the interpretation of this result. The present findings suggest that clitics and determiners are less velarized in CCS than nouns, which is anecdotally corroborated by the fact that when asked to give prototypical examples of *la ele catalana* in debriefing interviews, the overwhelming majority of examples given by CCS bilinguals were nouns (principally *algo* ‘something,’ *final* ‘final,’ and *ele* ‘1’). A differentiation based on word class is common in sound change phenomena (Bybee 2002; Pierrehumbert 2001), and accordingly the present study suggests that clitics and determiners may be a less salient as well as less common context for lateral velarization than open class words such as nouns.

Regarding the effect of Catalan cognate status, whereas Madrid speakers exhibited no statistical difference in velarization across cognate items, the bilingual speakers exhibited greater degrees of velarization for greater cognate items over lesser cognate items. This

cognate effect supports the existence of an interconnected bilingual lexicon in exemplar representation (cf. Brown & Harper 2009; Bybee 2002; 2006; Costa et al. 2005; Johnson 1997; Pierrehumbert 2001; 2003). In such a model of lexical representation, recall that the parallel activation of a greater Catalan cognate such as *hotel* ‘hotel’ (critically with the velarized lateral) alongside Spanish *hotel* during production increases the chance for the phonetic transfer of [ɫ] into Spanish more so than does the parallel activation of a lesser cognate like Catalan *paper* ‘paper’ (critically without a velarized lateral) alongside Spanish *papel*. Moreover, since the cognate effect was only evidenced in the speech of bilingual CCS speakers, this directly suggests the influence of language contact with Catalan on Spanish lateral production.

Lastly, with respect to surrounding segment place of articulation, a significant effect favoring lateral velarization in contexts of an adjacent non-front vowel and/or velar consonant was found for all speakers, bilingual and monolingual alike. This effect is interpretable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995) as a coarticulation phenomenon, precisely inasmuch as the coordination and partial blending or overlap of gestures permits the adjacent segments’ place of articulation to influence the degree of velar constriction during the lateral segment. As coarticulation phenomena are structurally based, this effect is most reasonably interpretable as a product of language universals or universal linguistic tendencies, independent of contact with Catalan.

RQ4: Is there evidence of the diffusion of CCS dark [ɫ] across the bilingual Catalan-Spanish speech community? If so, is this diffusion ongoing (i.e., is there evidence of a linguistic change in progress)?

As previously mentioned, a marginally significant effect of age was found for CCS bilinguals, such that the younger generation of bilinguals used less strongly velarized laterals than the older generation of bilinguals. Within an apparent time construct (cf. Bailey 2004; Bailey,

Wikle, Tillery, & Sand 1991; Chambers 2004; Labov 1963; 1972; Sankoff & Blondeau 2007), this could be interpreted as a change in progress whereby less strongly velarized laterals are being used more often than more strongly velarized laterals over time. An account for such a change in progress relates to strong degrees of lateral velarization being a stigmatized feature of CCS as indicated by covert and overt attitudes toward CCS dark [ɫ], the style correlate favoring lesser velarized laterals in careful speech, and the observed gender effect favoring lesser velarized laterals in female speech. Though such an interpretation would be consistent with the diastatic variation in lateral production reported for Barcelonan CCS by Wesch (1997: 296, 298) and the age effect for lateral production reported for the CCS in Palma de Majorca by Pieras (1999: 238), it is important to consider that velarization degrees nonetheless remain significantly stronger in the speech of younger Barcelonan bilinguals than in the monolingual Spanish speech of Madrid speakers. That is, even if lateral velarization degrees are weakening as an on-going change in Barcelonan CCS, they have yet to weaken enough to match the lack of velarization present in monolingual Madrid Spanish.

Still, the presently observed frequencies of ‘Catalan-like’ lateral usage across Catalan exposure and usage groups offer insight into the emergence of this feature. The emergence of a discretely dark [ɫ] in Barcelonan CCS appears to have begun in the speech of Catalan-dominant bilinguals, particularly those from smaller, Catalan-prevalent villages on the outskirts of the BMA, as these are the speakers for whom ‘Catalan-like’ laterals are most frequently the majority variant. Still, as ‘Catalan-like’ laterals are used as the majority variant by only half of group A speakers, this suggests that even within this prominently Catalan-dominant community of speakers, the CCS dark lateral has not yet fully diffused (or reached Croft’s [2000] fixation phase), which is somewhat expected given the present findings of negative overt and covert attitudes toward this CCS variant.

Nevertheless, since velarization degrees of all bilingual groups were found to be significantly stronger than those of Madrid monolinguals, rather than focus on the lack of diffusion of fully ‘Catalan-like’ laterals amongst the CCS-speaking community, it may be more appropriate to consider the propagation of a velarized lateral within the bilingual CCS community that is more velarized than the lateral category found in monolingual Spanish varieties, but nonetheless exhibits gradient variation in velarization degree according to each Catalan exposure and usage group. That is, since even Spanish-dominant bilinguals from Barcelona exhibit stronger velarization degrees than Madrid monolinguals, we may propose that a velarized lateral presently constitutes the norm of Barcelonan CCS, and is gradiently stronger or weaker depending on each speaker’s exposure and usage of Catalan. Under this line of analysis, it would be merited to consider that rather than adopt a strongly velarized (or fully ‘Catalan-like’) lateral, originally innovated by Catalan-dominant speakers from village communities, Catalan-dominant and Spanish-dominant bilinguals from Barcelona have fully adopted a slightly less velarized lateral that distinguishes their speech from monolingual Spanish, but is nonetheless gradiently less velarized in the Spanish-dominant community and more velarized in the Catalan-dominant community.

RQ5: What are the overt and covert social evaluations of CCS dark [ɫ]? How do these relate to social evaluations of “Catalanized Spanish” more generally? Additionally, how are differences in social values between the variants manifested in the paths of selection and propagation of each variant?

Covert attitudes toward CCS [l] and [ɫ] elicited from the matched guise revealed that [ɫ] is indeed associated with negative perceptions of a less attractive, less correct Spanish accent by both bilinguals and monolinguals alike.⁸³ Nevertheless, it was also positively associated

⁸³ Echoing footnote 82, future investigations should focus on examining the perceptual thresholds for light and dark laterals (i.e., the point at which a lateral sounds or no longer sounds ‘Catalan-like’ to various types of speakers).

with solidarity traits by bilingual CCS speakers, as well as linked to Catalanian identity and the Catalan language by all speakers. In the absence of any associations with age or power attributes, it can be reasoned that the positive affinity (in terms of solidarity) toward [ɫ] on the part of CCS bilinguals relates precisely to a feeling of closeness and shared Catalanian identity with the speaker, which is not shared by monolingual Madrid speakers outside of the bilingual community. This assessment is furthermore supported by overt attitudes from many bilingual speakers regarding the positive sense of closeness they feel when hearing CCS. While many bilingual participants overtly discussed the negative associations that CCS [ɫ] has with incorrect or improper Spanish in their debriefing interviews, the majority opinion expressed across all participants was one of ambivalence: participants claimed that the use of CCS [ɫ] is typical and natural, and accordingly did not evoke necessarily positive nor negative feelings. While a similar sense of neutrality or acceptance was commonly expressed regarding ‘Catalanized’ Spanish as a general variety of Spanish, Catalan-dominant bilinguals often juxtaposed their affinity towards ‘Catalanized’ Spanish alongside a frustration for being made fun of for having too strong of a Catalan accent. As dark laterals were found to be the phonetic feature of CCS of which most speakers had explicit awareness, we propose that while CCS features are generally positively esteemed by Catalan-Spanish bilinguals (insomuch as they are positively linked to a shared Catalanian identity), particularly salient ones (with a considerable degree of overt awareness) such as [ɫ] are *linguistic stereotypes*, and as the source of overt negative social cause speakers to perceive one’s CCS as ‘overly Catalanized.’

With respect to links between the status and perceptions of CCS [ɫ] and processes of selection and propagation, it was found that the most Catalan-dominant bilinguals, particularly those outside the urban capital, use (and likely originated) CCS [ɫ]. Within the urban capital, and particularly in the group of Spanish-dominant bilinguals, more extremely

velarized or ‘Catalan-like’ /l/ productions are rather infrequent. Accordingly, it is logical to conclude that the diffusion of a considerably velarized [ɫ] is rather resisted in the capital of Barcelona as a consequence of its salient status as a negatively perceived linguistic stereotype. Since Spanish-dominant bilinguals nonetheless maintain laterals that are more velarized than those of monolingual Madrid speakers, however, we may propose that the status of CCS [ɫ] as stigmatized is conducive (or more permissive) to the selection and diffusion of less extremely velarized /l/ productions from Catalan-dominant bilinguals to Spanish-dominant bilinguals, with the more extreme realizations being nearly categorically avoided by the latter group of bilinguals.

RQ6: What evidence is there to support an account of CCS dark [ɫ] as contact-induced? What evidence exists in favor of an endogenous account?

As Catalan laterals were shown to be significantly more velarized than Spanish laterals, the fact that degrees of CCS lateral velarization were found to be progressively stronger with increased exposure and usage of Catalan suggests that Catalan is acting as the source language in a case of phonetic transfer to Spanish. Moreover, the finding of a cognate effect only present for CCS bilinguals further corroborates the influence that Catalan has on the production of CCS laterals, and thus that status of CCS [ɫ] as contact-induced.

In addition to evidence supporting the contact-induced innovation of CCS [ɫ], however, a set of linguistic constraints was found to mediate lateral velarization in parallel manners in both CCS and monolingual Spanish, which suggests that purely structural forces also contribute to the overall dynamics of lateral velarization in CCS. In particular, CCS and monolingual Spanish laterals were found to be significantly more velarized in syllable-final contexts, as well as in contexts of an adjacent non-final vowel and/or velar consonant. As both of these effects (linked to coarticulation mechanisms within gestural phonology [cf.

Allen 1989: 33; Badia i Margarit 1984: 199; Browman & Goldstein 1989; 1991; 1995; Grandgent 1991: 185-187; Niedermann 1953: 9; Pieras 1999: 242; Rasico 1981: 200; Recasens 1996; 2014a: 20-21]) were found to operate in CCS (i.e., a contact-variety of Spanish) and Madrid Spanish (i.e., a non-contact variety of Spanish), it can be reasoned that their presence in CCS is independent of contact with Catalan. Thus, we may conclude that lateral velarization in CCS is jointly mediated by endogenous mechanisms (i.e., language universals) in addition to phonetic influence from Catalan.

CHAPTER 5: RESULTS - INTERVOCALIC FRICATIVE VOICING IN BARCELONAN CCS

In this chapter, we present the results of a set of descriptive and inferential statistics on the fricative data collected from the Catalan and Spanish formal speech phrase-list readings, Spanish casual speech from the sociolinguistic interviews, covert attitudes toward Spanish intervocalic fricative voicing from the matched guise, and overt attitudes toward CCS and CCS [z] from the debriefing interviews. We shall aim to answer the following research questions specific to the phenomenon of intervocalic fricative voicing:

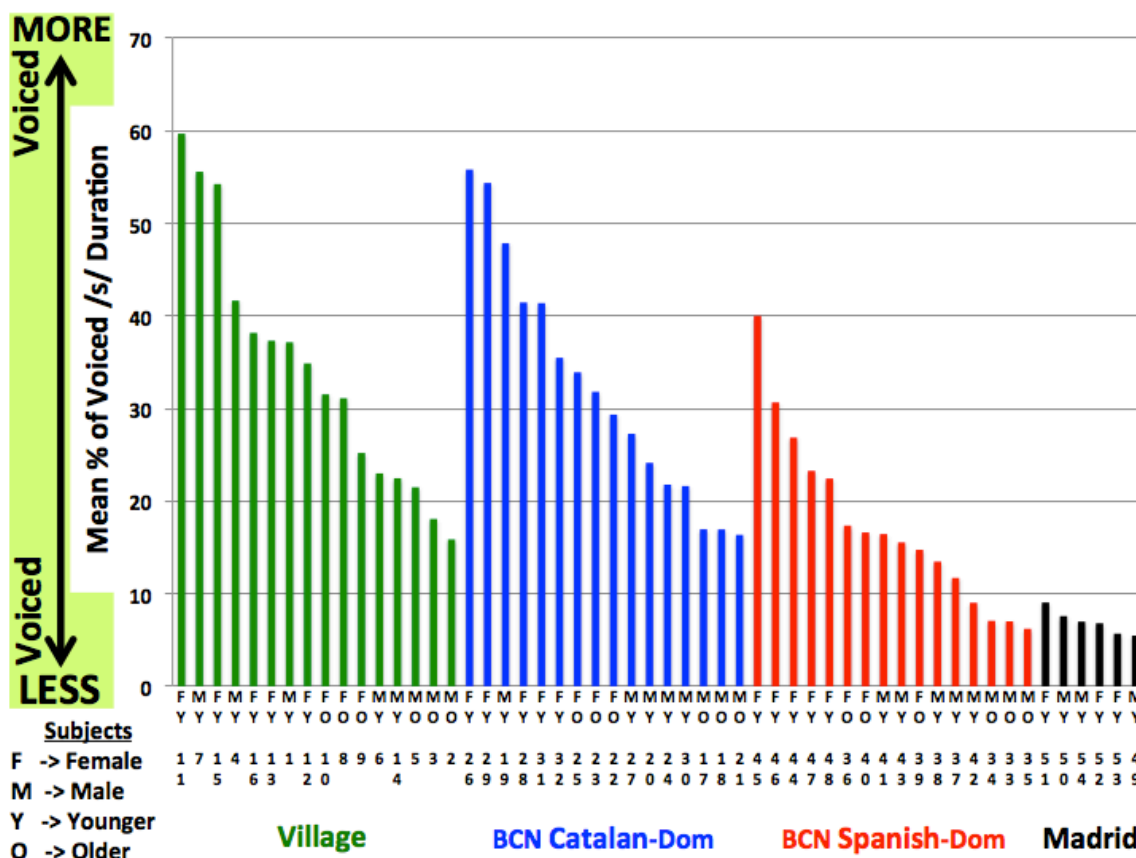
- RQ1:** To what extent is intervocalic fricative voicing present in modern Barcelonan CCS (as compared with non-contact, monolingual Spanish varieties)?
- RQ2:** What are the social (language-external) constraints affecting intervocalic fricative voicing in Barcelonan CCS?
- RQ3:** What are the linguistic (language-internal) constraints affecting intervocalic fricative in Barcelonan CCS?
- RQ4:** Is there evidence of the diffusion of CCS voiced [z] across the bilingual Catalan-Spanish speech community? If so, is this diffusion ongoing (i.e., is there evidence of a linguistic change in progress)?
- RQ5:** What are the overt and covert social evaluations of CCS intervocalic voiced [z]? How do these relate to social evaluations of “Catalanized Spanish” more generally? Additionally, how are differences in social values between the variants manifested in the paths of selection and propagation of each variant?
- RQ6:** What evidence is there to support an account of CCS voiced [z] as contact-induced? What evidence exists in favor of an endogenous account?

5.1. Elicited Production of Intervocalic Fricatives

5.1.1. Group Trends and Individual Comparisons

In order to give a better perspective of the overall distribution of higher and lower degrees of intervocalic fricative voicing found in the speech of the tested populations, the average degree of Spanish fricative voicing across all elicited tokens of intervocalic /s/ (from the formal speech reading and casual interview tasks) was computed for each speaker. These voicing degrees appear below in figure 46. Note that speakers are organized according to the Catalan exposure and usage groups previously detailed in table 8 in section 3.2.3: Village speakers (Group A) are those from smaller, more rural villages on the outskirts of the BMA, Catalan-dominant Barcelona bilinguals (Group B) are speakers from the city of Barcelona that use Catalan considerably more than Spanish, Spanish-dominant Barcelona bilinguals (Group C) are speakers from the city of Barcelona that use Spanish considerably more than Catalan, and lastly Madrid speakers are monolingual Spanish speakers from Madrid (Group D).

Figure 46 - Average Spanish Intervocalic /s/-Voicing Degree per Speaker



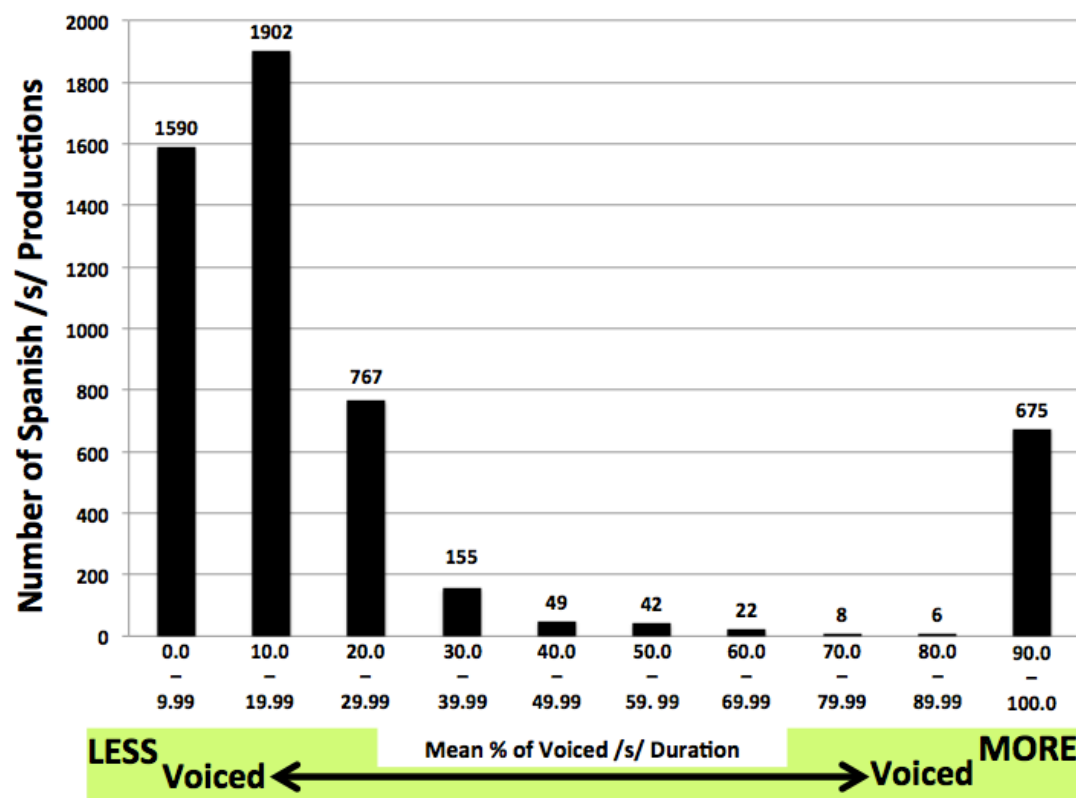
Though the effects of social factors such as speaker group (that is, degree of exposure to and usage of Catalan), age, and gender are tested using inferential statistics in sections 5.1.2 and 5.1.3, some initial trends are transparent from the raw voicing degrees depicted in figure 46. Most notably, though all speaker groups show a degree of within-group variation in /s/-voicing, voicing degrees appear to decrease with lesser exposure and usage of Catalan, from the Village group (A) and Catalan-dominant Barcelona group (B), which show nearly parallel voicing degrees, progressively to the Madrid monolingual group (D). This serves as a preliminary indication that the exposure to and usage of Catalan directly affects CCS voicing degrees, consistent with the speculation of contact-induced innovation. Curiously, a closer inspection of the bilingual speakers that voice the most or the least in their respective groups reveals that the most voicing bilingual individuals (per bilingual group) are predominantly

younger females, whereas the least voicing bilingual individuals (per bilingual group) are predominantly older males. This serves as a preliminary confirmation that age and gender play an important role in mediating this phenomenon in CCS, and furthermore is consistent with the scenario in which greater degrees of voicing, being a non-standard but crucially unstigmatized feature of this variety, are being increasingly adopted over time, led by female bilingual speakers.

In order to better understand what kinds of /s/ productions characterize the variation in voicing degrees illustrated in figure 46, all productions of Spanish intervocalic /s/ (from all speakers) were organized by voicing degree. Figure 47, below, illustrates that the vast majority of Spanish intervocalic /s/ productions exhibited voicing degrees toward the outer ends of the voicing spectrum, constituting relatively unvoiced segments with voicing durations of 0% to 30% or nearly completely voiced segments with voicing durations of 90% to 100%. Accordingly, less extreme /s/ productions (or those without nearly complete voicelessness or complete voicing) were produced least frequently (or with the least consistency).⁸⁴

⁸⁴ Gradoville (2011: 64) notes that “[d]uration, although strictly speaking not a measurement of voicing *per se*, may correlate with fricative voicing.” The negative correlation between voicing degree and length of fricative segment is a frequently attested finding across several languages (cf. Rivas 2006; Schmidt & Willis 2011; Torreira & Ernestus 2012; Stevens et al. 1992). We have performed a statistical correlation on our data that confirm this finding for CCS and Madrid Spanish: a two-tail Pearson’s correlation test revealed that as segment duration increased, the percentage of that segment’s duration that was voiced decreased ($r[5214] = -.5635736$, $p < .0001$). To give a point of reference, whereas the mean duration of Spanish /s/ segments with 0-10% voicing durations was approximately 95 milliseconds, the mean duration of Spanish /s/ segments with 90-100% voicing durations was 56 milliseconds, constituting a difference of nearly 40 milliseconds. Future investigations may consider analyzing the duration of adjacent vocalic segments in addition to /s/ in order to determine if processes of compensatory lengthening or shortening of adjacent vowels play any role in Spanish fricative voicing phenomena.

Figure 47 - Distribution of Voicing Degrees of Spanish Intervocalic /s/



Synthesizing the information reported in figures 46 and 47, intervocalic fricative production in CCS (as well as monolingual Madrid Spanish) is predominantly comprised of more extreme degrees of voicelessness or voicing, with more moderately voiced (or voiceless) tokens being relatively infrequent. This considerably skewed level of dispersion in voicing degrees permits a considerable degree of individual-speaker variation, particularly as mediated by exposure to and usage of Catalan, gender, and age. In order to empirically confirm these effects, however, we now turn to the results of inferential statistical analyses run on these elicited production data.

5.1.2. Intervocalic Fricative Voicing in Bilingual CCS

We begin by first exploring the intervocalic fricatives produced in the variety of Spanish spoken by bilingual Catalan-Spanish speakers in the Barcelona Metropolitan Area, that is,

bilingual CCS. In doing so, we can explore the linguistic and social factors that mediate CCS intervocalic fricative voicing (RQ#2, 3) and assess any trends for possible on-going change within an apparent time construct (RQ#4). Accordingly, we ran a mixed-effects linear regression in R using voiced segment duration as the dependent variable, testing for fixed effects of three linguistic factors (word position [initial vs. final], stress [stressed vs. unstressed], and word class [open vs. closed]) and four social factors (Catalan exposure and usage group [group A vs. B vs. C], age [older vs. younger], gender [male vs. female], and style [formal vs. casual]). Interaction terms between Catalan exposure and usage group 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 different speaker groups (e.g. group A vs. group B vs. group C). Individual speaker was included as a random effect in the model.

The results of the linear mixed-effects regression appear below in table 28 (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 Catalan exposure group ($F[2,56] = 5.81, p=.005$), age ($F[1,39] = 16.87, p=.0002$), gender ($F[1,39] = 5.97, p=.02$), style ($F[1,4573] = 107.17, p<.0001$), word position ($F[1,4573] = 1153.78, p<.0001$), stress ($F[1,4573] = 46.42, p<.0001$), and word class ($F[1,4573] = 23.67, p<.0001$). Additionally, four significant interaction effects were found, namely between Catalan exposure group and each of style ($F[2,4573] = 4.55, p=.01$), word position ($F[2,4573] = 110.79, p<.0001$), stress ($F[2,4573] = 3.02, p=.05$), and word class ($F[2,4573] = 3.03, p=.05$). 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 28 - Summary of Mixed-Effects Linear Regression Model Fitted to Bilinguals' CCS Fricatives

	β	t	p
(Intercept)*	51.826	12.664	<.0001
Group B	1.191	0.206	0.837936
Group C	-16.534	-2.848	0.006158
Younger	16.637	4.108	0.000199
Male	-9.583	-2.444	0.019174
Formal	-14.428	-10.352	<.0001
Word-Initial	-37.114	-33.967	<.0001
Open Class	5.517	4.865	<.0001
Group B : Formal	-3.309	-1.671	0.094856
Group C : Formal	-6.006	-3.009	0.002633
Group B : Word-Initial	5.931	3.824	0.000133
Group C : Word-Initial	22.393	4.482	<.0001
Group B : Unstressed	-0.04619	-5.94	<.0001
Group C : Unstressed	-0.0498	-6.433	<.0001
Group B : Open Class	0.922	0.571	0.568101
Group C : Open Class	-2.961	-1.812	0.070111

*The intercept is group A older females producing stressed, closed class, word-final /s/ in casual speech.

The estimated variance of the random effect of speaker is 56.74.

With respect to the effect of Catalan exposure and use group, post-hoc analyses (with Bonferonni correction [α level = 0.0167]) revealed that while voicing degrees for groups A and B were both significantly greater than those of group C (for each, $p < .0001$), there was no statistically significant difference in voicing degree between groups A and B ($p = .909$). Since voicing degrees for the two Catalan-dominant groups were greater than those of the Spanish-dominant bilinguals, this strongly suggests that voicing degrees are directly influenced by Catalan usage and exposure (evidencing contact influence from Catalan). Figures 48 and 49 offer a clear visualization of this relationship between CCS intervocalic /s/ production and Catalan exposure and use.

Figure 48 - Effect of Catalan Exposure and Use Groups on CCS /s/-Voicing - Bar Graph Means

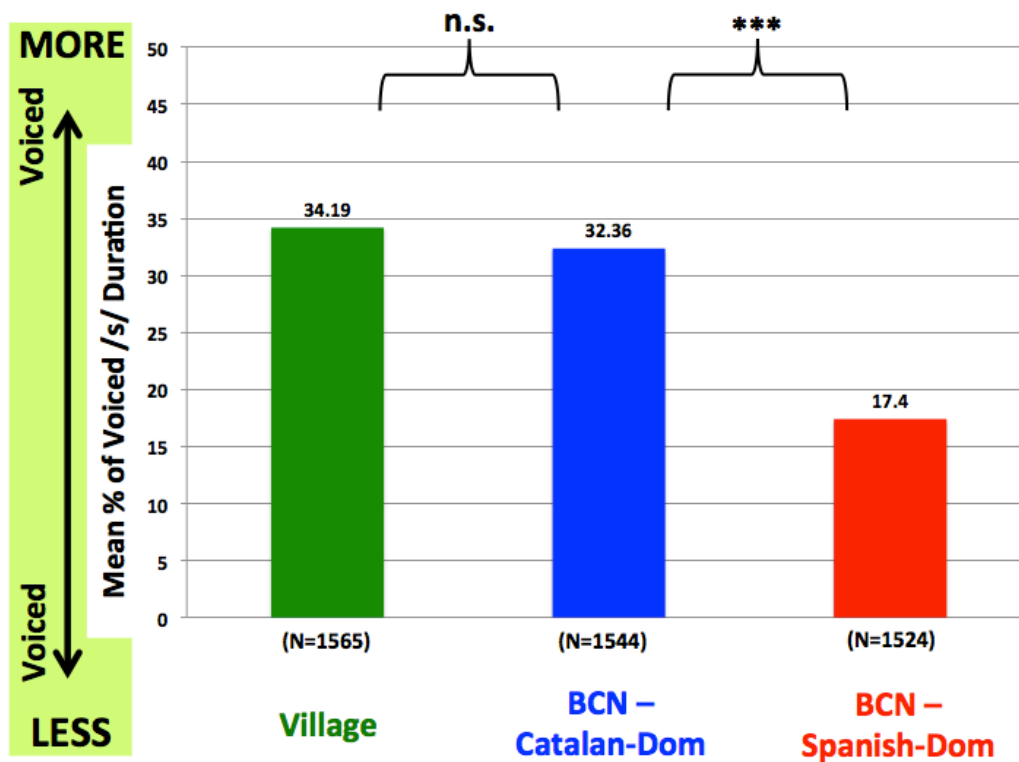
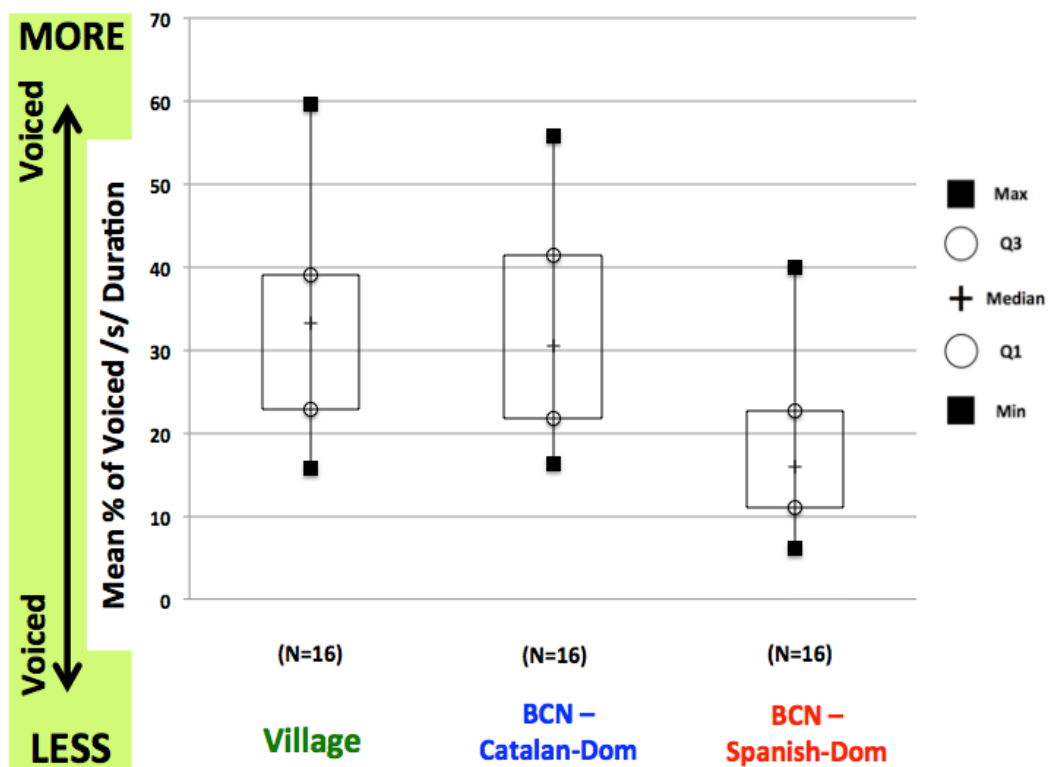
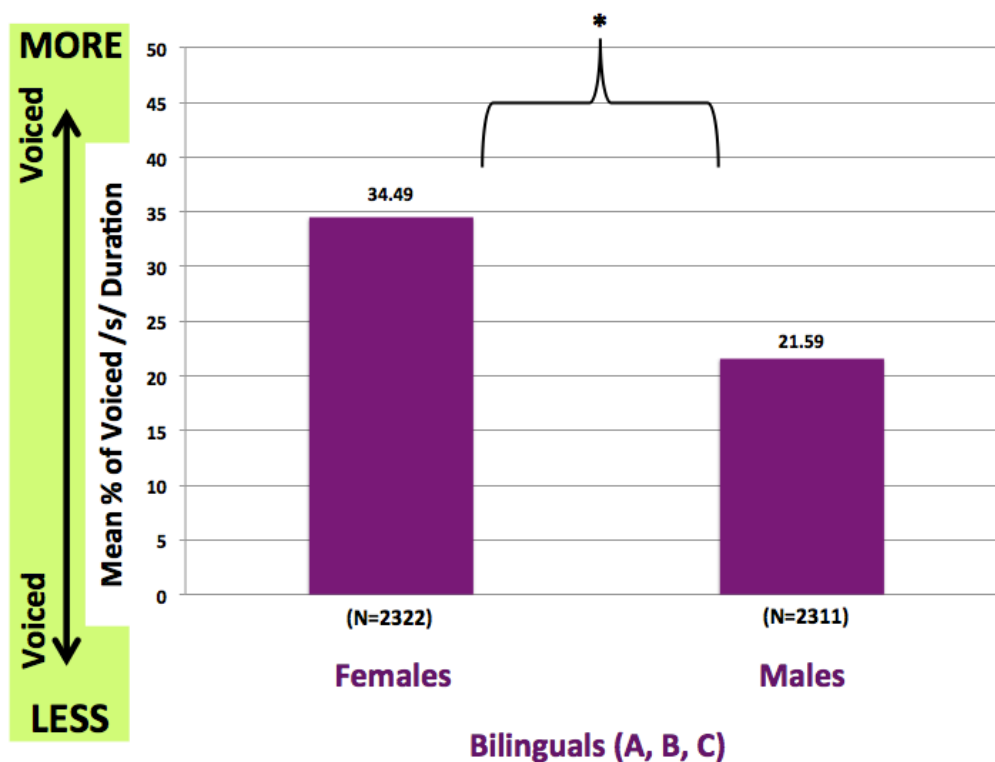


Figure 49 - Effect of Catalan Exposure and Use Groups on CCS /s/-Voicing - Box Plots



With respect to the aforementioned effect of gender on CCS intervocalic /s/ production, the lack of significant interaction between gender and Catalan exposure and use group confirms that for all three groups of bilingual speakers alike, voicing degrees were significantly greater for females than males. Note that should stronger voicing degrees lack any kind of negative social stigma in Barcelonan CCS, the present finding of stronger voicing degrees in female speech is precisely would what be expected according to the *gender paradox* (cf. Labov 2001). Figure 50 provides a visualization of this effect for the CCS bilinguals.

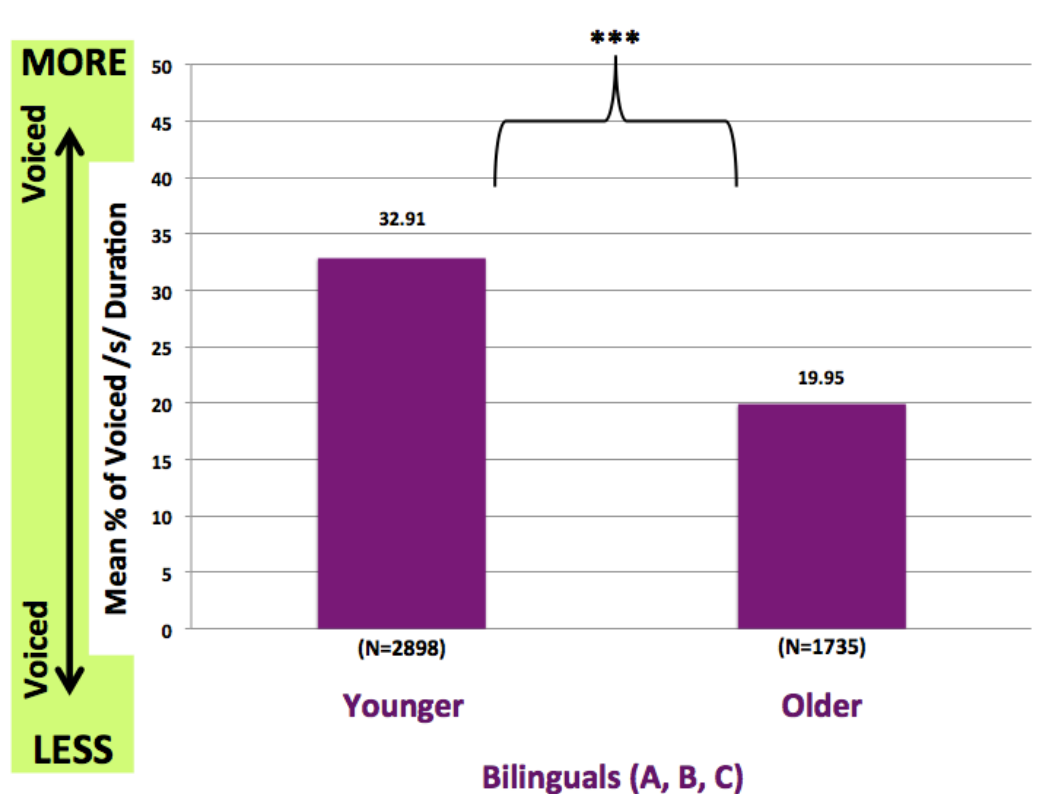
Figure 50 - Effect of Gender on CCS /s/-Voicing



With respect to the aforementioned effect of age on CCS intervocalic /s/ production, the lack of significant interaction between age and Catalan exposure and use group confirms that for all three groups of bilingual speakers alike, voicing degrees were significantly greater for younger speakers than older speakers. These data can unproblematically be interpreted (via the apparent time construct [cf. Bailey 2004; Bailey et al. 1991; Chambers 2004: 355-364;

Sankoff & Blondeau 2007]) as suggesting that CCS intervocalic fricative voicing degrees are indeed becoming stronger over time, which is consistent with the direction of the aforementioned gender effect, in that females, who would be expected to be the ones to lead such a change (cf. Labov 2001), in fact intervocalically voice to a significantly greater degree than males. Figure 51 provides a visualization of this effect for the CCS bilinguals.

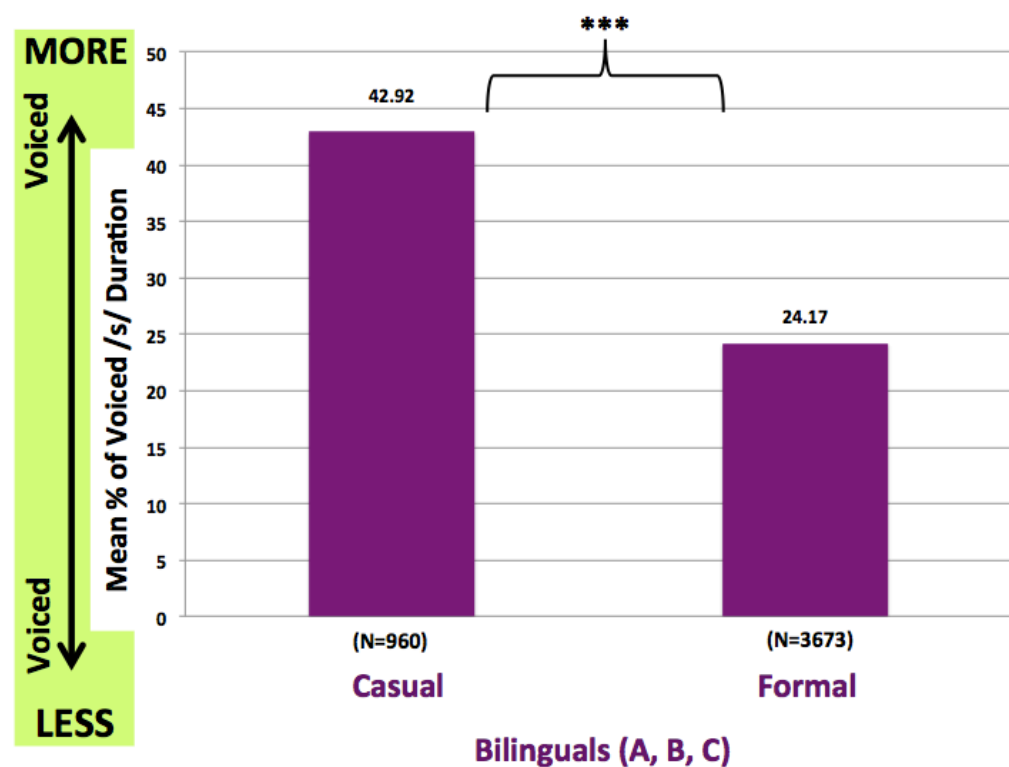
Figure 51 - Effect of Age on CCS /s/-Voicing



With respect to the aforementioned main effect of style, intervocalic /s/-voicing was stronger in casual speech (i.e., casual interviews) than formal speech (i.e., phrase-list readings). In light of the significant interaction effect between style and Catalan exposure and use group, post-hoc analyses (with Bonferonni correction [α level = 0.0167]) were conducted specifically to test for whether or not the style effect was absent in any one of the exposure

and usage groups.⁸⁵ The post-hoc tests revealed that the style effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater voicing in casual speech). As non-standard variants are expected to occur more frequently in casual speech than in careful, formal speech, this finding is consistent with the analysis of intervocalic /s/-voicing as a non-standard feature in this CCS. Figure 52 offers a clear visualization of this style effect in the CCS bilingual data.

Figure 52 - Effect of Style on CCS /s/-Voicing

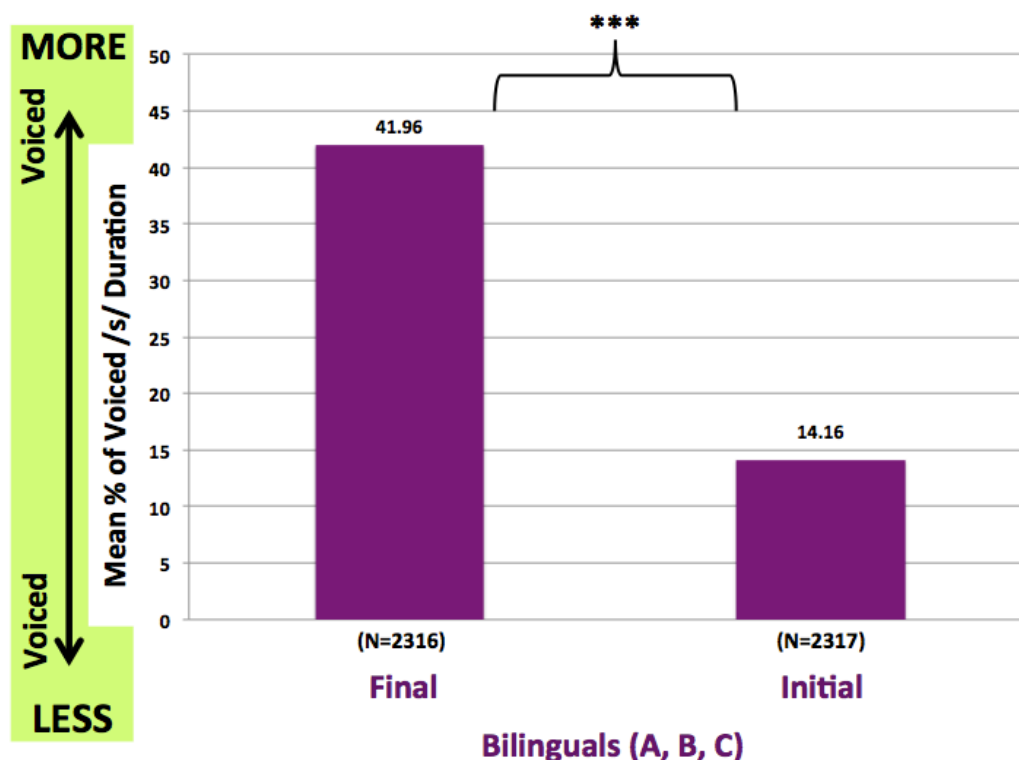


With respect to the aforementioned main effect of word position, intervocalic /s/-voicing was stronger in word-final contexts than in word-initial contexts. In light of the significant interaction effect between word position and Catalan exposure and use group, post-hoc

⁸⁵ Individual comparisons between styles across Catalan exposure and use groups (i.e., if voicing was distinct between group A's formal speech and group B's casual speech, etc.) were not of interest. Thus, post-hoc analyses were necessary in order to confirm whether or not the interaction effect reflected a lack of style effect altogether in any of the three groups, a difference in the direction of effect for any of the groups, or if instead it was merely reflective of some kind of asymmetry across individual comparisons (which were not of interest).

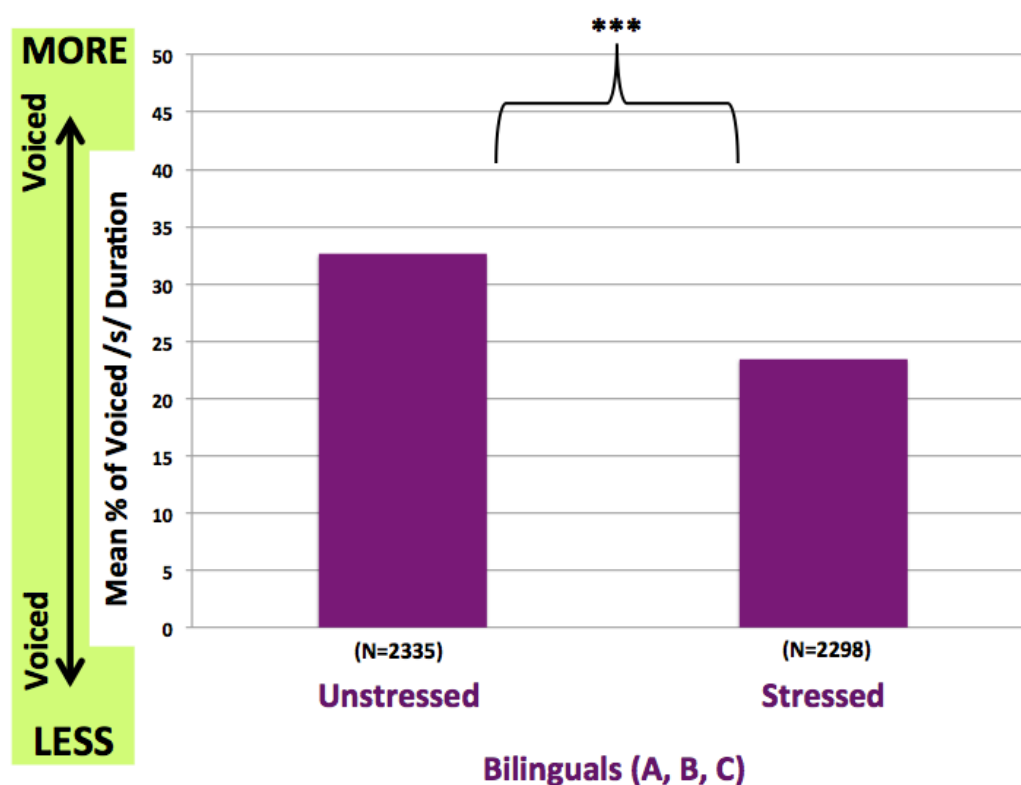
analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the word position effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the word position effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater voicing word-finally). Recall that Davidson (2012b: 28, 45-46; 2014a: 237-240; forthcoming) attributed this effect to the direct influence of Catalan, since the phonemic voicing contrast between Catalan /s/ and /z/ neutralizes word-finally. The present result essentially replicates this prior finding, and can therefore be considered further support for the linguistic influence of Catalan (i.e., structural motivation internal to Catalan) on intervocalic /s/-voicing in CCS. We will nonetheless return to this analysis upon investigating word position effects in monolingual Spanish, which offers an alternative (but not mutually exclusive) account of these data trends. Figure 53 offers a clear visualization of this word position effect in the CCS bilingual data.

Figure 53 - Effect of Word Position on CCS /s/-Voicing



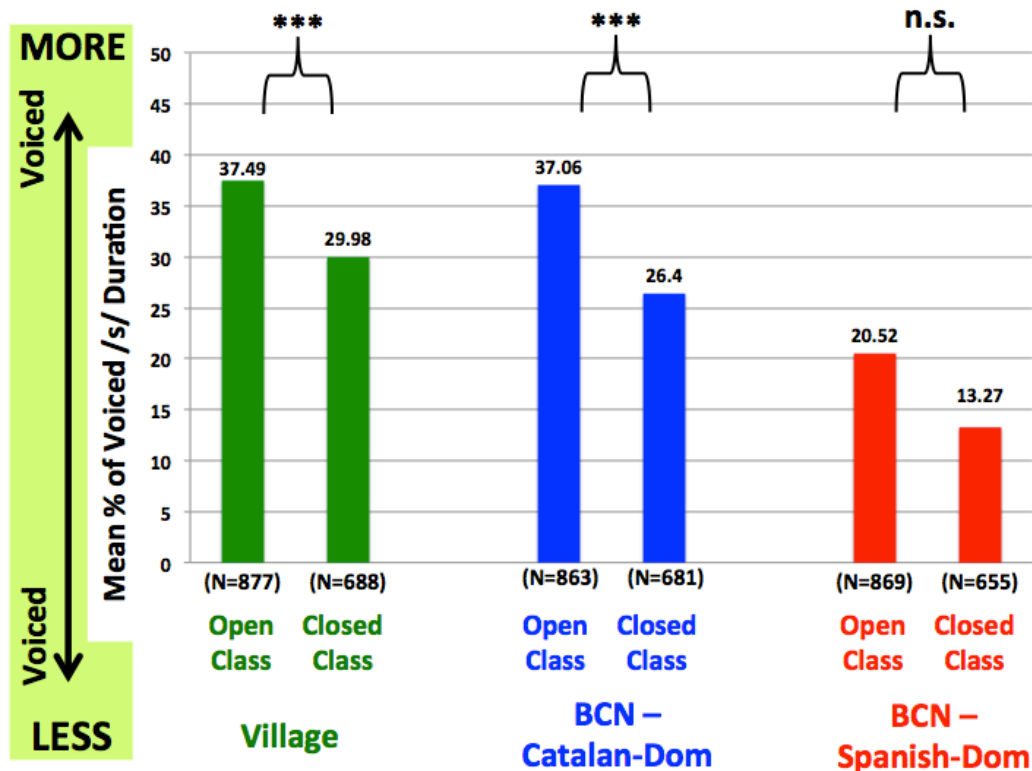
With respect to the aforementioned main effect of stress, intervocalic fricative voicing was stronger in unstressed contexts than stressed contexts. In light of the significant interaction effect between stress and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the stress effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the stress effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater /s/-voicing in unstressed contexts). A stress effect in this direction is predictable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995) as an effect of hyper-articulation across longer stressed-syllable sequences in Spanish (Hualde 2005: 244; 2014: 251), which facilitates the coordination of glottal (voicing) gestures across the vowel-/s/-vowel sequence. Accordingly, the observed stress effect evidences linguistic mechanisms specific to Spanish (i.e., structural motivations internal to Spanish) mediating intervocalic fricative production in CCS. Figure 54 offers a clear visualization of this stress effect in the CCS bilingual data.

Figure 54 - Effect of Stress on CCS /s/-Voicing



Lastly, with respect to the aforementioned main effect of word class, intervocalic fricative voicing was stronger in open class items than closed class items. However, in light of the significant interaction effect between word class and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the word class effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the word class effect, while in the same direction across all bilingual groups, only reached statistical significance for groups A and B (for both, $p < .0001$), and was just shy of statistical significance for group C ($p = .03$). Figure 55 offers a clear visualization of this word class effect in the CCS bilingual data.

Figure 55 - Effect of Word Class on CCS /s/-Voicing



Summarizing the results presented for the bilingual CCS cohort, a set of both linguistic and social factors has been found to mediate CCS intervocalic fricative voicing. Regarding linguistic factors, intervocalic voicing degrees are favored in word-final and unstressed contexts, as well as in open class words. As for social factors, stronger degrees of intervocalic /s/-voicing were found in the Catalan-dominant speakers over the Spanish-dominant speakers, and in female speech, casual speech, as well as in the speech of the younger generation of speakers. The combination of gender and age effects is suggestive of a change in progress, namely one in which voicing degrees are increasing over time, led by the younger generation of female speakers. We will return to this analysis upon discussing the results of the matched guise task, which will help to better inform our interpretation of these present data trends. Lastly, note that the aforementioned effects of word-position (linguistic) and Catalan exposure and use group (extralinguistic) both highlight contact with Catalan as a mediating

factor in the emergence and usage of this feature, whereas the effect of stress highlights the structural forces also in play.

5.1.3. Comparing Fricatives in Bilingual CCS to Madrid Spanish Fricatives

The production trends previously discussed in section 5.1.2 offer a characterization of Barcelonan CCS in terms of several linguistic and social factors, but cannot speak to how these trends compare with non-contact varieties of Spanish. Accordingly, in this section, we explore a subset of the Barcelonan elicited production data, namely all data from the younger generation of speakers, and draw comparisons in terms of select linguistic factors with Madrid monolingual Spanish (spoken by a comparably-aged group of younger speakers). These comparisons are necessary to make more definitive claims about the role of language contact in Barcelonan CCS (RQ#6), and permit a quantification of the relative degree of intervocalic fricative voicing present in modern Barcelonan CCS as compared with a monolingual variety of Spanish (RQ#1). Accordingly, we ran a mixed-effects linear regression in R using voiced segment duration as the dependent variable, testing for fixed effects of three linguistic factors (word position [initial vs. final], stress [stressed vs. unstressed], and word class [open vs. closed]) and two social factors (Catalan exposure and usage group [group A vs. B vs. C vs. D] and style [formal vs. casual]).⁸⁶ Interaction terms between Catalan exposure and usage group 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 different speaker groups (e.g. group A vs. group B vs. group C vs. group D). Individual speaker was included as a random effect in the model.

The results of the linear mixed-effects regression appear below in table 29 (note that

⁸⁶ Since the purpose of these analyses was to examine the linguistic factors operating in Barcelonan CCS in comparison with monolingual Spanish as a means of assessing which were truly independent of contact with Catalan, style and Catalan exposure and use group were the only two social factors entered considered in the statistical model.

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 Catalan exposure group ($F[3,59] = 24.52, p < .0001$), style ($F[1,3429] = 58.46, p < .0001$), word position ($F[1,3429] = 1214.03, p < .0001$), and class ($F[1,3429] = 23.26, p < .0001$). Additionally, three significant interaction effects were found, namely between Catalan exposure group and each of style ($F[3,3429] = 7.73, p < .0001$), word position ($F[3,3429] = 173.64, p < .0001$), and word class ($F[3,3429] = 3.88, p = .009$). 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 29 - Summary of Mixed-Effects Linear Regression Model Fitted to Younger Speakers'

Fricatives

	β	t	p
(Intercept)*	67.8979	16.977	<.0001
Group B	-5.2298	-0.923	0.35988
Group C	-25.1489	-4.42	<.0001
Group D	-51.1039	-7.781	<.0001
Formal	-13.3578	-7.646	<.0001
Word-Initial	-47.8171	-34.843	<.0001
Unstressed	6.5317	4.753	<.0001
Open Class	6.8545	4.823	<.0001
Group B : Formal	-3.8943	-1.57	0.11662
Group C : Formal	-11.2589	-4.5	<.0001
Group D : Formal	-1.0824	-0.376	0.70726
Group B : Syllable-Initial	8.9771	4.611	<.0001
Group C : Syllable-Initial	29.7919	15.248	<.0001
Group D : Syllable-Initial	45.2161	20.133	<.0001
Group B : Open Class	-1.5764	-0.78	0.43567
Group C : Open Class	-4.3606	-2.129	0.0333
Group D : Open Class	-7.3466	-3.126	0.00178

*The intercept is group A older females producing stressed, closed class, word-final /s/ in casual speech.

The estimated variance of the random effect of speaker is 114.4.

With respect to the effect of Catalan exposure group, post-hoc analyses (with Bonferonni correction [α level = 0.0083]) revealed that although there was no significant difference in voicing degree between the two Catalan-dominant groups ($p = .694$), these groups (A and

B) exhibited significantly higher voicing degrees than the Spanish dominant bilinguals (for A-C, $p=.002$; for B-C, $p=.006$). Moreover, all bilingual groups voiced significantly more than the Madrid monolinguals (for A-D and B-D, $p<.0001$; for C-D, $p=.007$). This confirms that the voicing degrees present in modern Barcelonan CCS are truly distinct (greater in degree) from monolingual Spanish, and that even Spanish-dominant bilinguals (group C) use intervocalic fricatives with stronger voicing degrees than Spanish monolinguals. Figures 56 and 57 offer a clear visualization of this relationship between Spanish intervocalic /s/ production and Catalan exposure and use.

Figure 56 - Effect of Catalan Exposure and Use Groups on Spanish /s/-Voicing (Younger Speakers) - Bar Graph Means

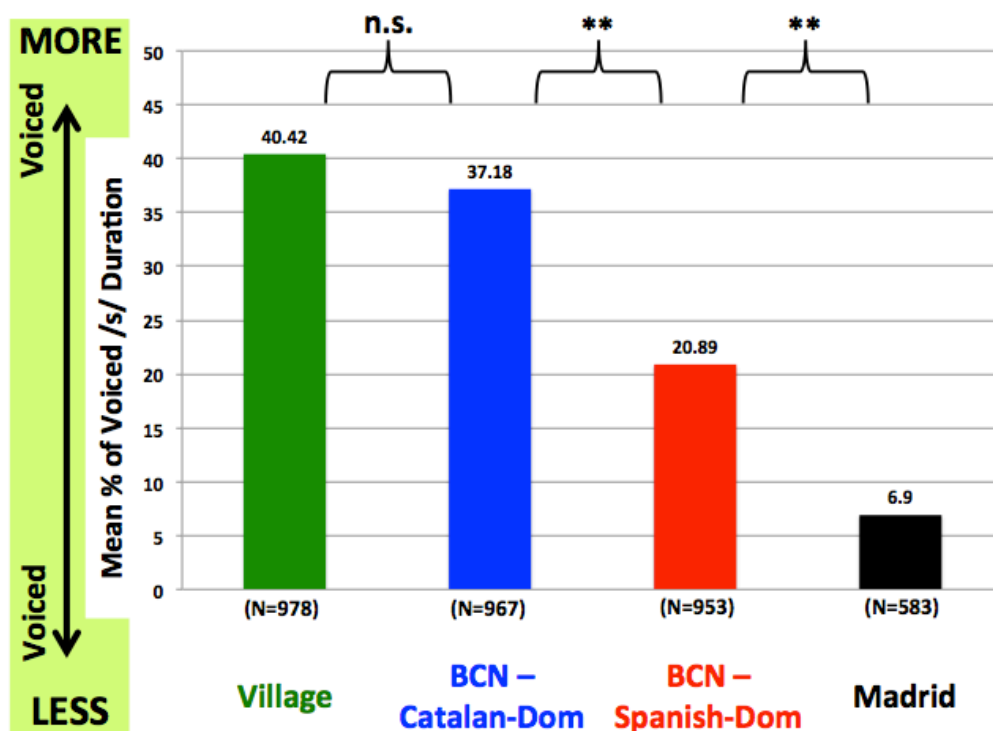
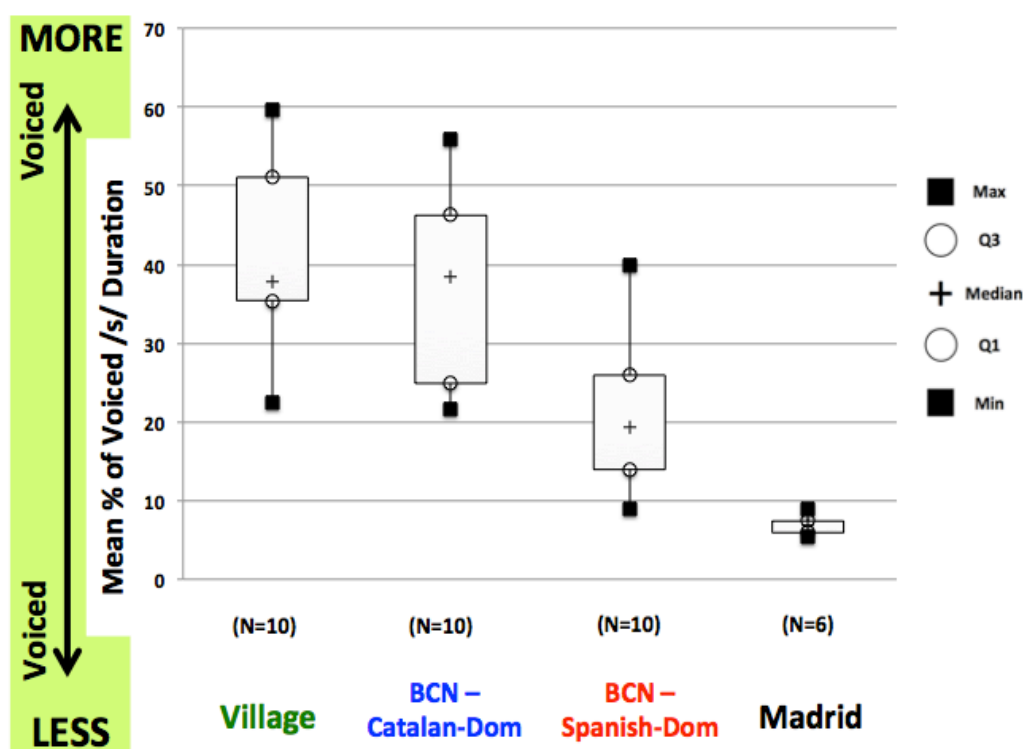


Figure 57 - Effect of Catalan Exposure and Use Groups on Spanish /s/-Voicing (Younger Speakers) -

Box Plots

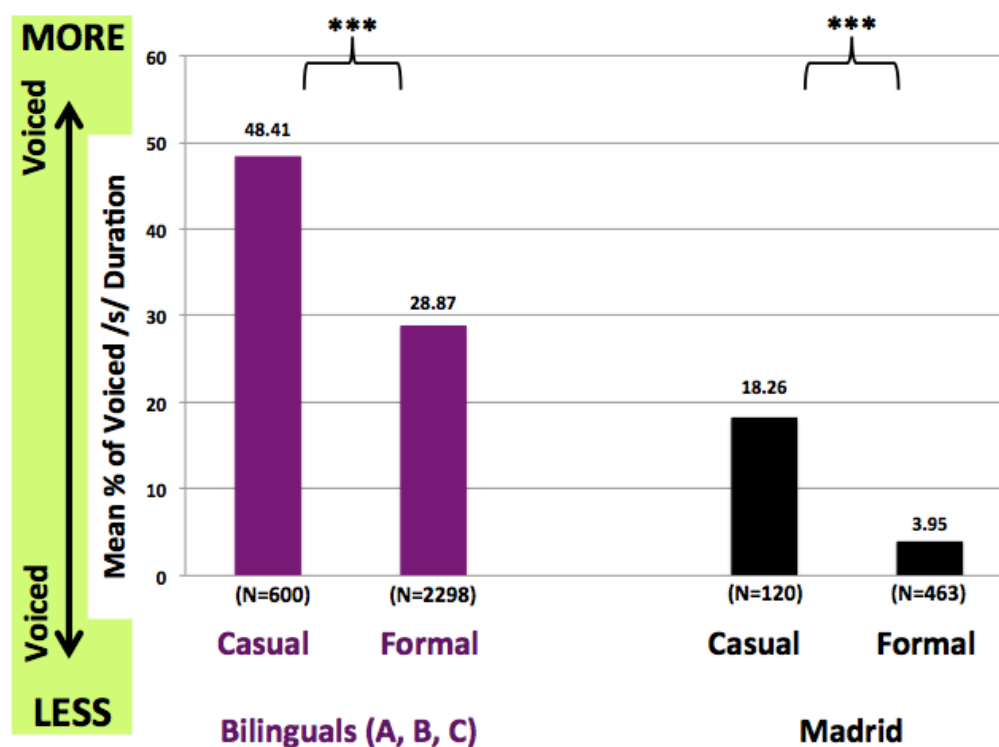


With respect to the aforementioned main effect of style, intervocalic fricative voicing was stronger in casual speech (i.e., casual interviews) than formal speech (i.e., phrase-list readings). In light of the significant interaction effect between style and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the style effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the style effect was in fact present in all four exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater /s/-voicing in casual speech). Since greater degrees of voicing are a non-standard feature of CCS, pending confirmation from the matched guise experiment and debriefing interviews of an awareness of intervocalic /s/-voicing and/or overt negative social commentary about the feature, CCS /s/-voicing is likely a *linguistic marker* or *stereotype* (cf. Labov 1972; 2001). That is, it shows social stratification (linked to bilingual CCS speakers

and greater exposure and use of Catalan), a style correlate, and may or may not have negative social value.

However, since a style correlate was also observed in monolingual Spanish speech, an additional (but not mutually exclusive) account of greater /s/-voicing in casual speech must be proposed. Recall that intervocalic /s/-voicing has been reported as sensitive to speech rate effects, favoring greater voicing with faster speech rates, in several varieties of Spanish including Madrid Spanish (cf. Torreira & Ernestus 2012: 137), Quito Spanish (cf. Strycharczuk et al. 2014: 24, 34), and Highland Colombian Spanish (García: 2013: 82-84). These speech rate effects are accounted for in terms of intervocalic /s/-voicing being a phenomenon of lenition. The lenition of /s/ to [z] intervocalically is favored in faster speech styles, such as casual speech, in the sense that the coordination of glottal (voicing) gestures at faster (more casual) speech rates is more likely to exhibit overlap and/or gestural blending than at slower, more careful speech rates (cf. Browman & Goldstein 1989; 1991; 1995; Campos-Astorkiza 2014: 19; Hualde 2014: 107; Romero 1999; Torreira & Ernestus 2012: 139). Accordingly, the presently observed style effect across bilinguals and monolinguals alike suggests that in addition to higher degrees of /s/-voicing being a non-standard marker of Barcelonan CCS, they also are influenced by universal properties of lenition, common to all varieties of Spanish and not specific to the situation of language contact with Catalan. Though we will return to this analysis upon detailing the results of the matched guise experiment, the present findings are sufficient for claiming that CCS intervocalic /s/-voicing is both socially and stylistically marked. Figure 58 offers a visualization of these style trends across the different groups of speakers.

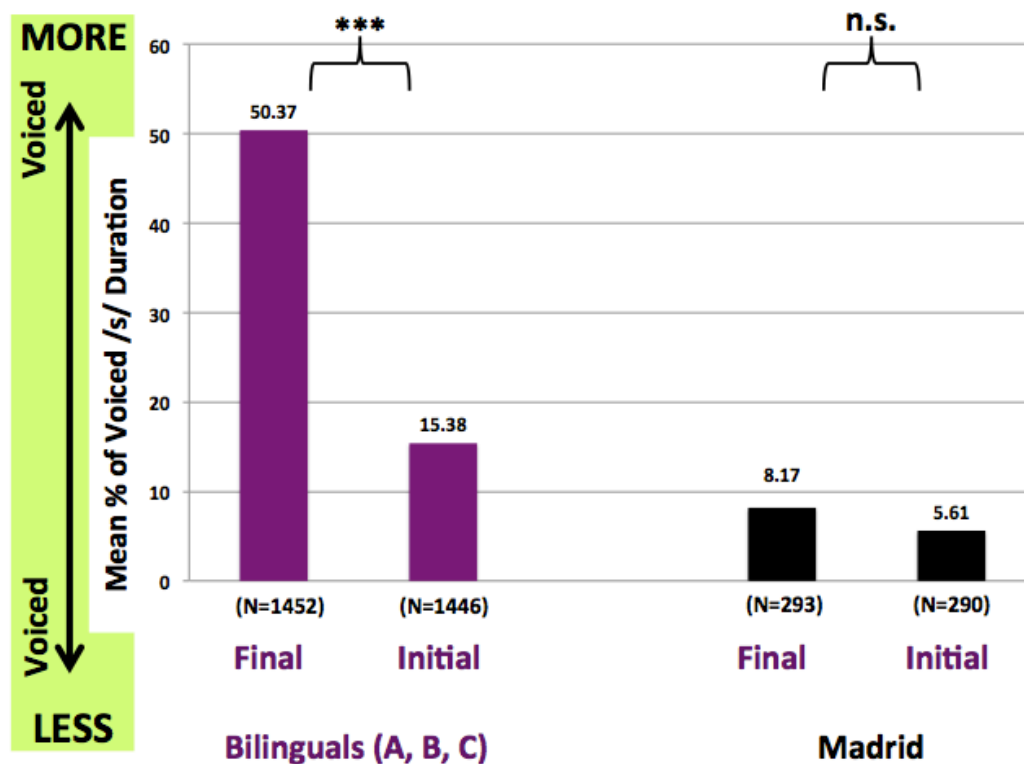
Figure 58 - Effect of Style on Spanish /s/-Voicing (Younger Speakers)



With respect to the aforementioned main effect of word position, intervocalic /s/-voicing was stronger in word-final contexts than in word-initial contexts. In light of the significant interaction effect between word position and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0125]) were conducted specifically to test for whether or not the word position effect was absent in any one of the Catalan exposure and usage groups. The post-hoc tests revealed that while the direction of the word position effect (favoring greater voicing degrees in word-final contexts over word-initial contexts) was consistent across all Catalan exposure and usage groups, this difference was only statistically significant for the bilingual CCS groups (for each, $p < .0001$), and did not reach statistical significance in the Madrid monolingual group ($p = .143$). This bilingual-only effect, replicated in Davidson (2012b: 28, 45-46; 2014a: 237-240; forthcoming), can be linked to an influence of Catalan inasmuch as only the word-final context allows for phonetic transfer from Catalan, since the word-initial context in Catalan maintains a voicing contrast between

/s/ and /z/. The word-final intervocalic context, a site of /s/-/z/ voicing neutralization, systematically resolves in voiced [z] (Hualde 1992: 371-372, 393-394; Hualde & Prieto 2014: 109; Julià i Muné 2008: 66-67; Pieras 1999: 212; Prieto 2004: 208, 216; Recasens 2014b: 239-240; Wheeler 2005: 147-149, 162), and accordingly this is the precise context in which voicing is greatest in CCS. Figure 59 offers a visualization of this word position effect across the different groups of speakers.

Figure 59 - Effect of Word Position on Spanish /s/-Voicing



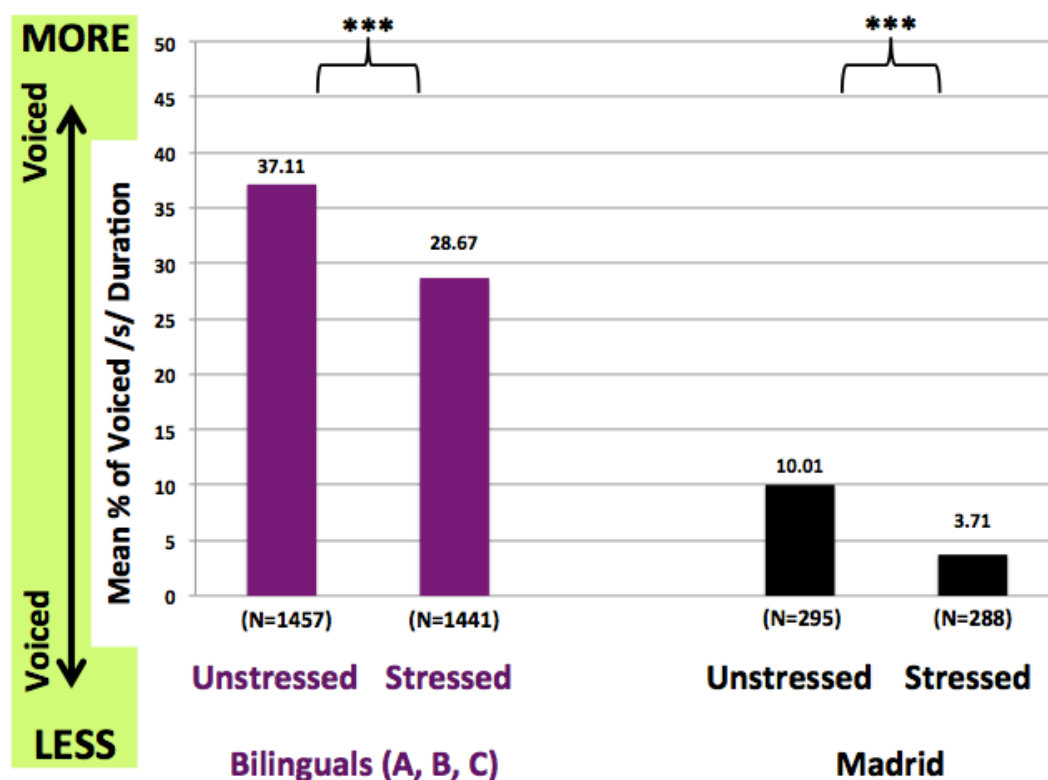
Alternatively, however, one must consider that parallel findings of increased intervocalic fricative voicing word-finally have nonetheless been reported for monolingual Spanish varieties such as Madrid Spanish (cf. Hualde & Prieto 2014: 119; Torreira & Ernestus 2012: 137), accounted for in terms of a difference in gestural coordination between a sequence of V#CV and a sequence of VC#V within articulatory phonology (cf. Nam, Goldstein, & Saltzman 2009, as cited in Hualde & Prieto 2014: 123). Accordingly, some degree of the

word position effect for the CCS speakers may in fact be motivated by linguistic universals.⁸⁷ However, we believe that the CCS word position effect can be more strongly linked to Catalan influence than this universal linguistic tendency, which we shall demonstrate with respect to the distribution of ‘Catalan-like’ (nearly) fully voiced /s/ productions in section 5.1.4.

With respect to the aforementioned main effect of stress, the lack of significant interaction between stress and Catalan exposure and use group confirms that for all bilinguals and monolinguals alike, voicing degrees were significantly greater in unstressed contexts than stressed contexts. Recall that a stress effect in this direction is predictable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995) as an effect of hyper-articulation across longer stressed-syllable sequences in Spanish (Hualde 2005: 244; 2014: 251), which facilitates the coordination of glottal (voicing) gestures across the vowel-/s/-vowel sequence. The fact that this effect was found in CCS as well as monolingual Madrid Spanish acts as further support for the classification of this effect as a product of language-internal properties of Spanish, unrelated to language contact with Catalan. Figure 60 offers a clear visualization of this stress effect in the CCS bilingual data and the monolingual Madrid Spanish data.

⁸⁷ The lack of statistically significant difference between word positions in the Madrid dataset may be a product of being included in a model alongside the CCS data, in which the magnitude of effect is particularly strong for the bilingual groups. The relatively smaller effect in the Madrid dataset, while in the same direction, may simply have been overshadowed by the overwhelming difference in mean voicing duration between the two word positions in the CCS data, and therefore not have achieved statistical significance in the model.

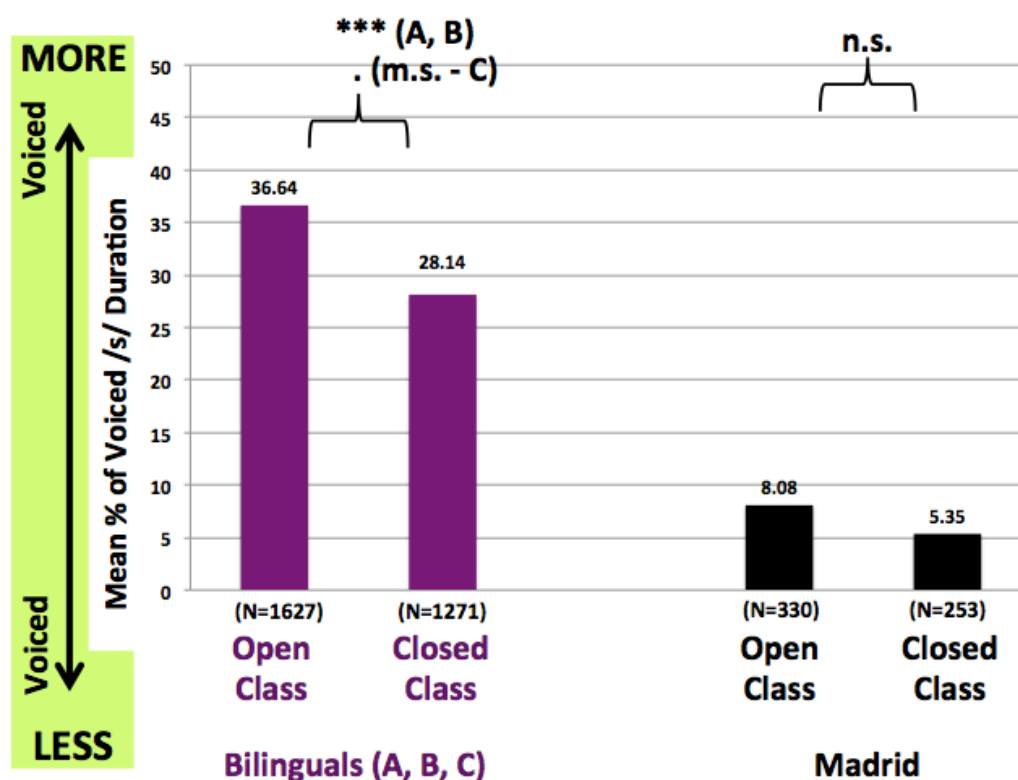
Figure 60 - Effect of Stress on Spanish /s/-Voicing



Finally, with respect to the aforementioned main effect of word class, intervocalic /s/-voicing was stronger in open class words than closed class words. In light of the significant interaction effect between word class and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [alpha level = 0.0125]) were conducted specifically to test for whether or not the word class effect was absent in any one of the Catalan exposure and usage groups. The post-hoc tests revealed that while the direction of the word position effect (favoring greater voicing degrees in open class words over closed class words) was consistent across all Catalan exposure and usage groups, this difference was statistically significant for the Catalan-dominant groups (for each, $p < .0001$), but did not reach statistical significance for the Spanish-dominant bilinguals ($p = .091$) and Madrid monolinguals ($p = .793$). Thus, only for the speakers that exhibit the highest degree of intervocalic fricative voicing is a distinction in voicing degree across word class evidenced. Figure 61 offers a clear visualization of this

word class effect in the Catalan-dominant bilinguals.

Figure 61 - Effect of Word Class on /s/-Voicing



Summarizing the results presented for the younger cohort of bilingual and monolingual speakers, select social and linguistic factors have been found to be operating in both CCS and monolingual Spanish, whereas others have been shown to only play a role in Barcelonan CCS. Regarding the former, effects of stress and style (interpreted in terms of a faster speech rate) present across bilingual and monolingual Spanish varieties suggest that structural (i.e., articulatory) motivations, independent of language contact, most certainly mediate intervocalic fricative voicing in Barcelonan CCS. In tandem with these endogenous motivations, however, is a set of constraints (both linguistic and extralinguistic) indicative of Catalan influence, namely word position and Catalan exposure and use group, which distinguish the usage patterns of intervocalic fricative voicing in CCS from those in monolingual Madrid Spanish. Notably, intervocalic /s/-voicing degrees in Barcelonan CCS

(even for Spanish-dominant bilinguals) are stronger than those present in Madrid Spanish. Additionally, word class effects favoring greater voicing degrees in open class words over closed class words were found in the speaker groups with the greatest voicing degrees, namely the Catalan-dominant bilinguals from village communities and from Barcelona.

5.1.4. Voiced [z] Production in Bilingual CCS and Madrid Spanish

While the prior analyses in sections 5.1.2 and 5.1.3 are useful for identifying linguistic and social factors mediating CCS intervocalic /s/-voicing, as well as possible language change with respect to changing degrees of intervocalic /s/-voicing over apparent time, the discussion of a concrete innovation and subsequent diffusion of voiced [z] is made somewhat challenging because voicing has been treated as a gradient phenomenon. Accordingly, in order to offer a discussion of the frequency with which a voiced intervocalic [z] is used in Barcelonan CCS (in comparison with Madrid monolingual Spanish), we have incorporated the voicing data from the Catalan elicited production task as a means of establishing a discrete reference point for voiced [z]. First, in order to verify that intervocalic fricative voicing degrees are indeed stronger in Catalan than in Spanish, a linear mixed-effects regression was run in R using voiced segment duration as the dependent variable, testing for a fixed main effect of language (Catalan vs. Spanish), as well as an interaction between language and Catalan exposure and usage group (group A vs. group B vs. group C) to verify that any significant difference in voicing degree between Catalan and Spanish was consistent across the three bilingual groups. Subject was incorporated as a random effect. Note that data entered into this model came from the formal elicited tasks (phrase-list readings) from Spanish and Catalan of the bilingual speakers. Additionally, since voicing degrees in bilingual CCS were considerably lesser in the word-initial context, in order to permit a more balanced comparison between voicing degrees across Catalan and Spanish, only word-final

intervocalic Spanish /s/ tokens were entered into the model.

The results of the linear mixed-effects regression appear below in table 30 (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 Catalan exposure group ($F[2,54] = 34.23, p < .0001$), language ($F[1,2617] = 703.06, p < .0001$), and a significant interaction between the two ($F[2,2613] = 36.01, p < .0001$).

Table 30 - Summary of Mixed-Effects Linear Regression Model Fitted to Spanish & Catalan Fricatives

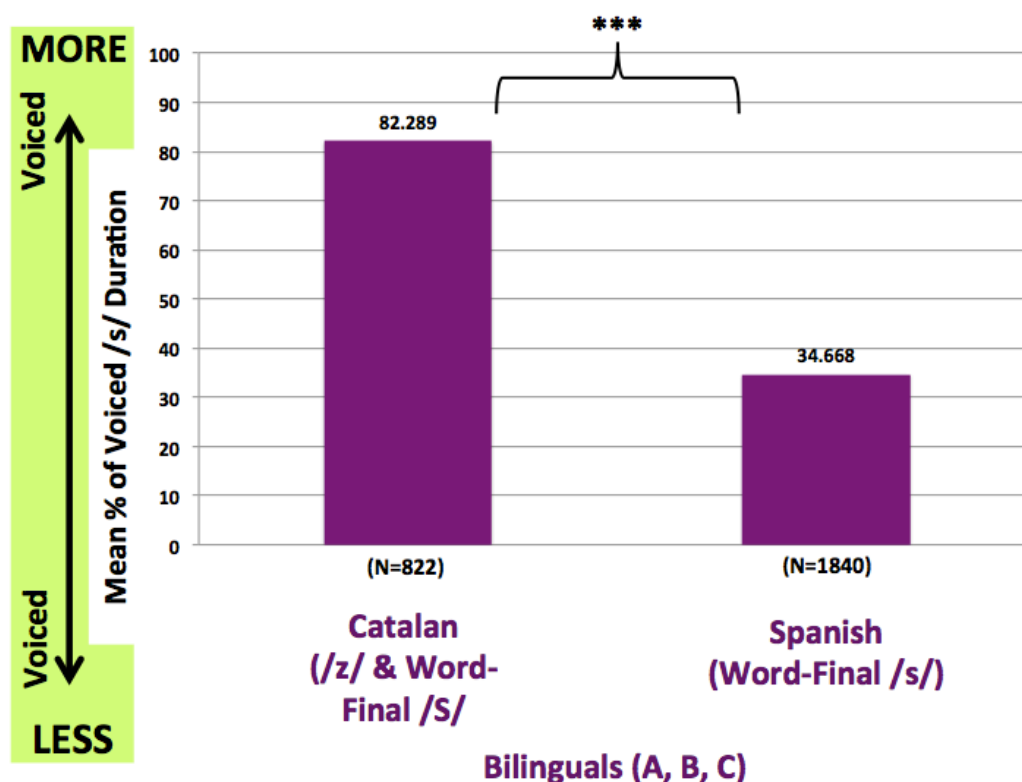
	β	t	p
(Intercept)*	96.7355	21.533	<.0001
Group B	0.1638	0.026	0.9794
Group C	-45.2214	-7.137	<.0001
Spanish Language	-50.5734	-26.517	<.0001
Group B : Spanish Language	-5.6319	-2.132	0.0331
Group C : Spanish Language	15.776	5.927	<.0001

*The intercept is group A speakers producing intervocalic (voiced) fricatives in Catalan. The estimated variance of the random effect of speaker is 281.5.

With respect to the effect of language,⁸⁸ voicing degrees were indeed greater for Catalan /z/ and word-final prevocalic /S/ than Spanish word-final prevocalic /s/. In light of the significant interaction effect between language and Catalan exposure and use group, post-hoc analyses (with Bonferroni correction [α level = 0.0167]) were conducted specifically to test for whether or not the language effect was absent in any one of the exposure and usage groups. The post-hoc tests revealed that the language effect was in fact present in all three exposure and usage groups (for all, $p < .0001$), in the same direction (favoring greater voicing in Catalan over Spanish). These findings are visualized below in figure 62.

⁸⁸ The main effect of Catalan exposure and use group revealed that the combined voicing degrees across Spanish and Catalan progressively decreased from groups A and B (between which there was no significant difference [$p = .66$]) to group C (for each post-hoc comparison, $p < .0001$ [α level = 0.0167]). Since we are precisely interested in voicing degrees in each language separately, this finding is rather uninformative, and accordingly we shall not comment on it further.

Figure 62 - Effect of Language on Intervocalic Fricative Voicing



Having shown that Catalan /z/ and word-final prevocalic /S/ are indeed significantly more voiced than Spanish (word-final) intervocalic /s/, we then calculated the average percentage of voiced segment duration for Catalan voiced fricatives produced by the Catalan-dominant bilinguals in groups A and B. This average voicing percentage of 97.1% (i.e., a fricative of nearly completely uninterrupted voicing) was then treated as the reference value for a ‘Catalan-like’ voiced fricative. Again, since fricative voicing is a gradient phenomenon, rather than propose that all Spanish intervocalic fricatives with voiced segment durations of 97.1% or more are intrinsically voiced ([z])⁸⁹, we simply are considering that any Spanish alveolar fricative produced with a voiced segment duration of 97.1% or more is *at least* as voiced as the average Catalan voiced alveolar fricative, which has been recognized as voiced

⁸⁹ Arguably, however, given the voicing distributions previously shown in figure 47, it would seemingly be reasonable to consider a Spanish fricative voiced for 97.1% of its duration voiced [z]. Nevertheless, to make our analyses of Spanish intervocalic /s/-voicing and lateral velarization more parallel, we shall proceed to discuss ‘Catalan-like’ voicing degrees in Spanish independently of the observed Spanish voicing distributions.

[z] (or /z/) in many prior studies (cf. Bonet & Lloret 1998: 118-119; Hualde 1992: 371-372, 393-394; Hualde & Prieto 2014: 109; Julià i Muné 2008: 66-67; Pieras 1999: 212; Prieto 2004: 208, 216; Recasens 2014b: 239-240; Wheeler 2005: 147-149, 162).

With this discrete reference value, we are able to explore the degree of diffusion of a Spanish intervocalic fricative *at least* as voiced as the typical Catalan /z/ and word-final prevocalic /S/ across the bilingual groups, as well as compare the frequencies of its use between bilingual CCS and monolingual Madrid Spanish. Accordingly, a Chi-square test was run on the proportion of fricatives produced with voicing duration percentages of 97.1 or higher across the Catalan exposure and use groups in word-final position. An additional Chi-square test was run on the same proportions in word-initial position since this factor was particularly strong in differentiating greater and lesser degrees of voicing in the CCS data. Data for the model came from the younger generation of CCS speakers in order to be maximally comparable to the similarly aged monolingual Spanish speakers from Madrid. The results of the Chi-square tests, shown below in tables 31 and 32, as well as figures 63 and 64, revealed that the proportions of ‘Catalan-like’ Spanish fricatives was not equally distributed across the groups in either word position (for word-final position, $\chi^2=290.0694$, $df=3$, $p<.0001$; for word-initial position, $\chi^2=16.38$, $df=3$, $p=.00094766$ [with Yates’ correction]). Post-hoc cell-wise comparisons revealed that a significantly greater proportion of word-final ‘Catalan-like’ fricatives were produced by speakers in groups A and B, and significantly smaller proportions of word-final ‘Catalan-like’ fricatives were produced by speakers of groups C and D. Moreover, a significantly greater proportion of word-initial ‘Catalan-like’ fricatives were produced by speakers in group D, whereas significantly smaller proportions of word-initial ‘Catalan-like’ fricatives were produced by speakers of groups A, B, and C.⁹⁰

⁹⁰ Note that the significantly greater proportion of word-initial voiced fricatives produced by group D speakers, while not directly linkable to any propensity for voicing in Spanish, nonetheless is in line with the finding of voicing in this position (among others) as somewhat common in Madrid speakers’ speech in Torreira & Ernestus (2012), accounted for as a natural phenomenon of lenition.

Table 31 - Counts of ‘Catalan-like’ Word-Final Spanish Fricatives Produced by Younger Speakers

Catalan Exposure and Use Group	# of ‘Catalan-like’ Fricatives	# of non-‘Catalan-like’ Fricatives	TOTAL
Group A	258	230	488
Group B	203	277	480
Group C	83	401	484
Group D	7	286	293
TOTAL	551	1194	1745

Table 32 - Counts of ‘Catalan-like’ Word-Initial Spanish Fricatives Produced by Younger Speakers

Catalan Exposure and Use Group	# of ‘Catalan-like’ Fricatives	# of non-‘Catalan-like’ Fricatives	TOTAL
Group A	0	490	490
Group B	0	487	487
Group C	4	465	469
Group D	7	283	290
TOTAL	11	1725	1736

Figure 63 - Percentages of ‘Catalan-like’ Fricatives in Younger Speakers’ Spanish - Bar Graph

Means

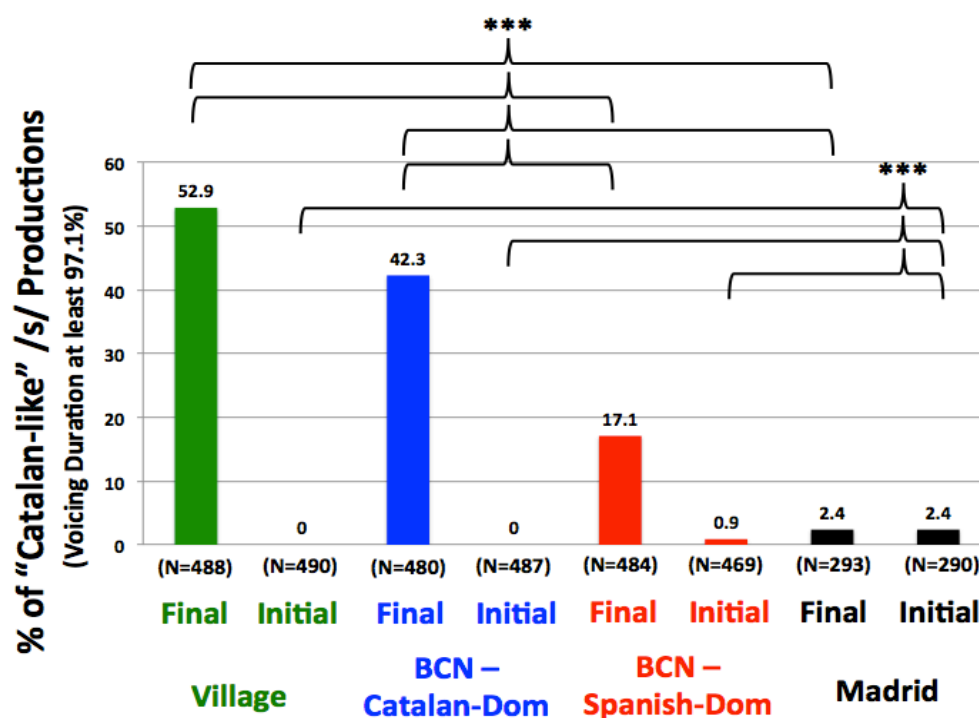
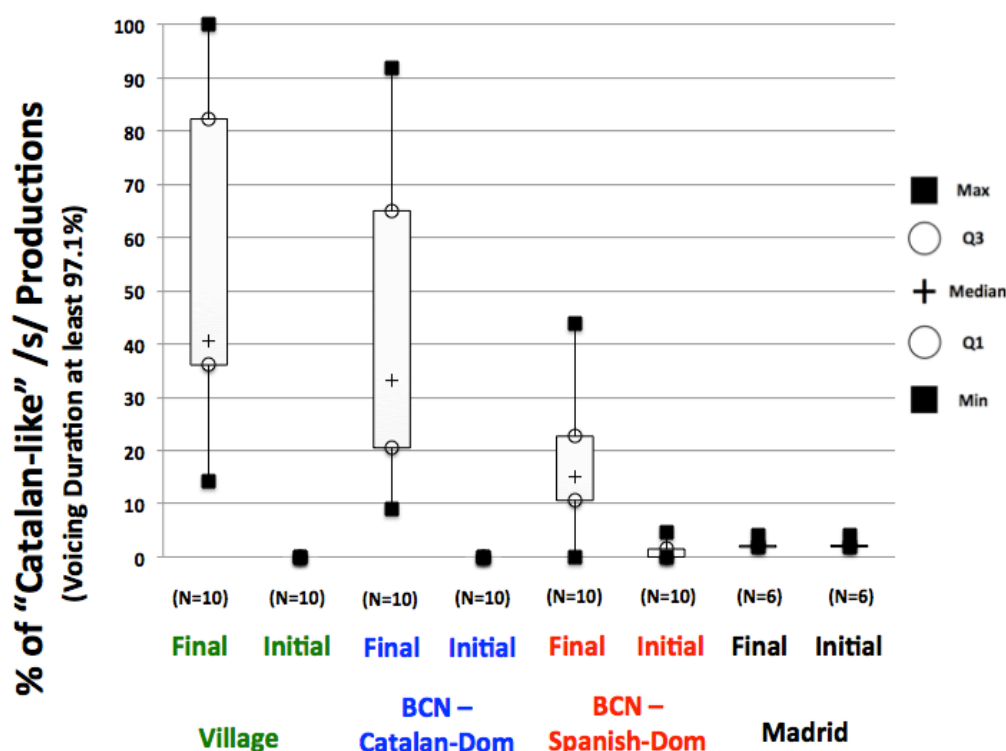


Figure 64 - Percentages of ‘Catalan-like’ Fricatives in Younger Speakers’ Spanish - Box Plots



With respect to the degree to which intervocalic fricative voicing is present in bilingual CCS in comparison with monolingual Madrid Spanish, our findings suggest that intervocalic [z] (via our proxy of ‘Catalan-like’ fricatives) is considerably more frequent in CCS than monolingual Madrid Spanish. In word-final position, ‘Catalan-like’ fricatives constitute a majority variant for group A speakers (at a usage rate of nearly 53%) and are used over 40% of the time by Catalan-dominant bilinguals in Barcelona, compared to a frequency of less than 3% in Madrid Spanish. Although Spanish-dominant bilinguals use ‘Catalan-like’ fricatives in word-final position considerably less than Catalan-dominant bilinguals, their frequency of ‘Catalan-like’ fricative production is over 7 times that of monolingual Madrid speakers. Accordingly, regarding the word-final position, our data are consistent with the proposal that ‘Catalan-like’ Spanish [z] (crucially only word-finally) was innovated by Catalan-dominant bilinguals (especially those from smaller, Catalan-prevalent villages), and

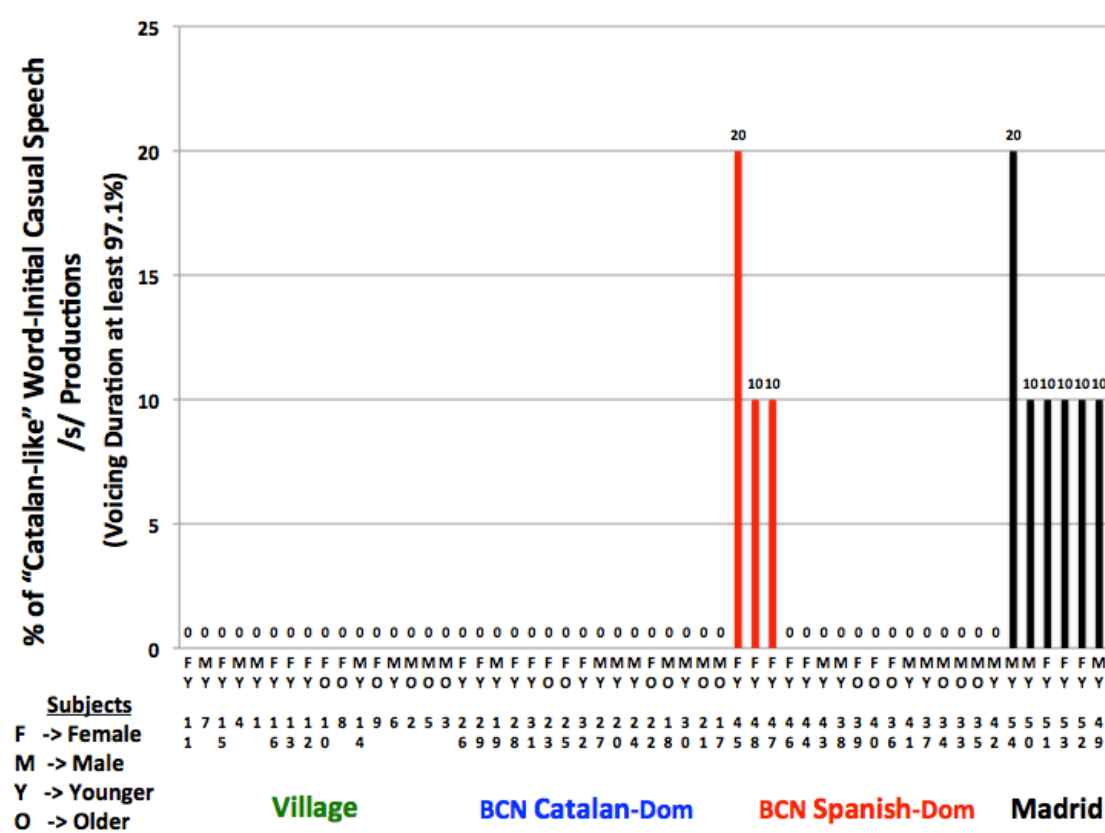
continues to mark their Spanish speech. However, these ‘Catalan-like’ word-final fricatives do not show evidence of having fully propagated outside of the bilingual community of Catalan-dominant speakers, as Spanish-dominant bilinguals still show considerably high rates of non-‘Catalan-like’ word-final fricative usage.

In word-initial position, we see a rather distinct pattern of ‘Catalan-like’ voicing in CCS. Catalan-dominant bilinguals categorically avoid these nearly fully voiced fricatives in word-initial intervocalic position, whereas Spanish-dominant bilinguals, and in particular monolingual Spanish speakers from Madrid, produce them with some frequency, albeit admittedly low. It is this qualitatively distinct effect of word position, being categorical exclusively for Catalan-dominant bilinguals, that we propose constitutes much stronger evidence of a contact effect from Catalan than a language-internal preference for greater voicing word-finally.

In order to more closely examine these group trends, individual frequencies of ‘Catalan-like’ /s/ usage were calculated for each speaker based on word position. Since the few examples of word-initial intervocalic ‘Catalan-like’ fricatives were exclusively in casual speech, we have visualized the trends for this position exclusively in casual speech. For word-final ‘Catalan-like’ fricatives, however, both formal and casual speech styles are represented. These frequencies, shown below in figures 65 and 66, reveal that the Catalan-dominant bilinguals (groups A and B) include various speakers that use a ‘Catalan-like’ /s/ over 50% of the time (i.e., voiced [z] as a majority variant) word-finally. One young female speaker in group A categorically uses ‘Catalan-like’ fricatives word-finally, and alongside two other speakers with nearly categorical usage of ‘Catalan-like’ word-final fricatives, it can be proposed that for select group A speakers, nearly fully voiced /s/ productions constitute a majority variant that has nearly fully entered formal speech registers (i.e., recall that the majority of all /s/ productions were elicited from formal speech). The considerable presence

of ‘Catalan-like’ word-final fricatives as a nearly categorically favored variant of /s/ in group A speakers suggests that this feature was innovated in this speech community, in which it has extended considerably (and is continuing to extend, as informed by the age effect favoring greater voicing in the younger generation of speakers). Outside of group A speakers, the adoption of a ‘Catalan-like’ word-final fricative is sharply divided by language dominance. Whereas nearly half (four of ten) of the younger generation of Catalan-dominant bilinguals from Barcelona use ‘Catalan-like’ fricatives as a majority variant, Spanish-dominant bilinguals have yet to adopt this feature enough to be used as a majority variant (across formal and informal speech styles). As for the word-initial position, it is clear that ‘Catalan-like’ fricatives in this position are a minority variant, and have yet to be incorporated into formal speech registers by any speaker, bilingual or monolingual. Still, their usage (word-initially) is noticeably greater in the monolingual community than the CCS community, which we propose evidences an effect of Catalan phonotactics in Catalan-dominant speakers that restricts intervocalic /s/-voicing to word-final contexts and categorically bars ‘Catalan-like’ voicing in word-initial contexts, the site of phonemic voicing contrast in Catalan.

Figure 66 - Individual Frequencies of ‘Catalan-like’ Casual Spanish Intervocalic Word-Initial /s/ Production



experiment according to each targeted attribute, discussing parallels and differences between scaled and non-scaled responses where appropriate. Note that all statistical analyses for scaled responses were performed using z-scores (derived from the raw scores) to normalize responses across the subjects. Figures illustrating the results, however, use raw scores to facilitate their interpretation.

In order to test for differences in solidarity ratings (i.e., if the speaker seemed nice, friendly, and pleasant to listen to), a linear mixed-effects regression was run in R using solidarity score as the dependent variable, testing for a fixed main effect of guise (voiceless guise vs. voiced guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in solidarity score between the voiceless and voiced guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 33 (note that negative β coefficients indicate lower solidarity ratings [i.e., less nice, less pleasant, less friendly] compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[3,72] = 5.49, p=.002$), guise ($F[1,50] = 78.41, p<.0001$), and a significant interaction between the two ($F[3,50] = 12.44, p<.0001$).

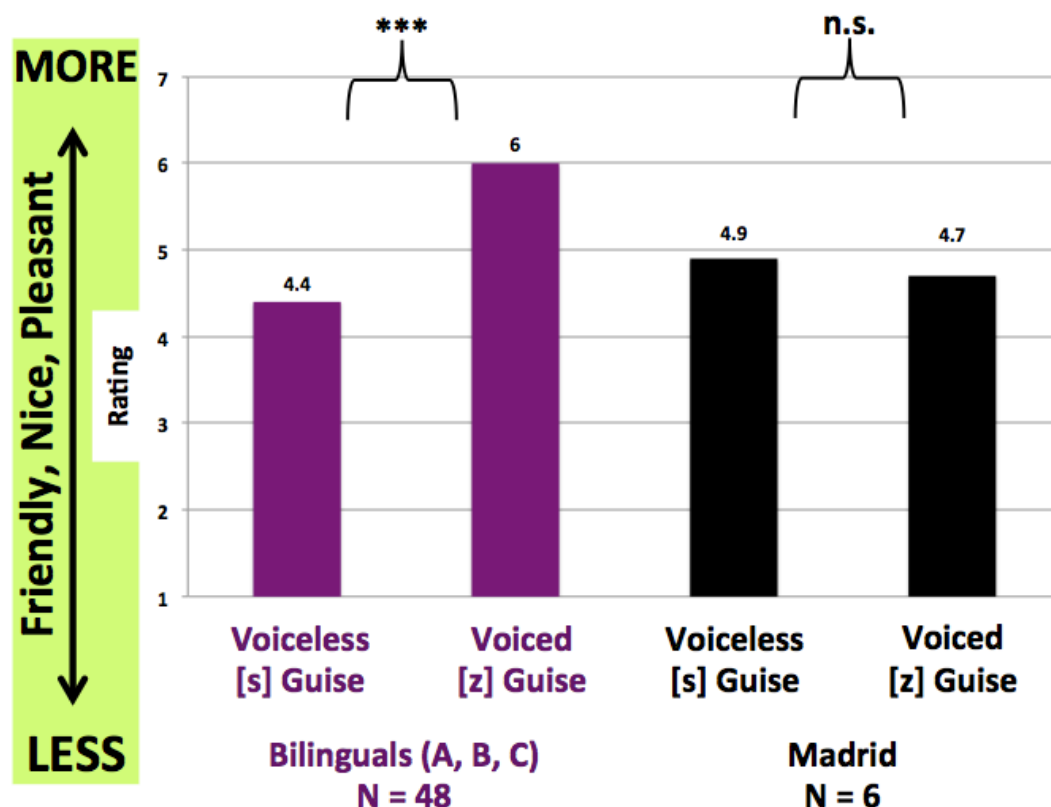
Table 33 - Summary of Mixed-Effects Linear Regression Model Fitted to CCS /s/ Solidarity Scores

	β	t	p
(Intercept)*	0.72252	4.686	<.0001
Group B	-0.14136	-0.648	0.51885
Group C	0.25131	1.153	0.25291
Group D	-0.93195	-3.156	0.00233
Voiceless Guise	-1.19373	-8.855	<.0001
Group B : Voiceless Guise	-0.01571	-0.082	0.93467
Group C : Voiceless Guise	-0.14136	-0.741	0.46188
Group D : Voiceless Guise	1.36128	5.273	<.0001

*The intercept is group A speakers rating the voiced guise.
The estimated variance of the random effect of speaker is 0.235.

As the only statistical comparisons of relevance to our research questions are those concerned with whether or not each group of speakers differentiated the voiceless and voiced guises by solidarity score, we limit our discussion of results to the significant interaction between guise and Catalan exposure and use group. Post-hoc analyses (with Bonferroni correction [α level = 0.0125]) revealed that all three bilingual groups (A, B, and C) attributed significantly higher solidarity scores to the voiced guise over the voiceless guise (for all, $p < .0001$), whereas the Madrid group uniquely rated the two guises equally ($p = .45$). These findings are visualized below in figure 67.

Figure 67 - Solidarity Score Differences for Voiceless and Voiced Guises



In order to test for differences in power ratings (i.e., if the speaker seemed educated and had a high-paying job), a linear mixed-effects regression was run in R using power score as the dependent variable, testing for a fixed main effect of guise (voiceless guise vs. voiced guise)

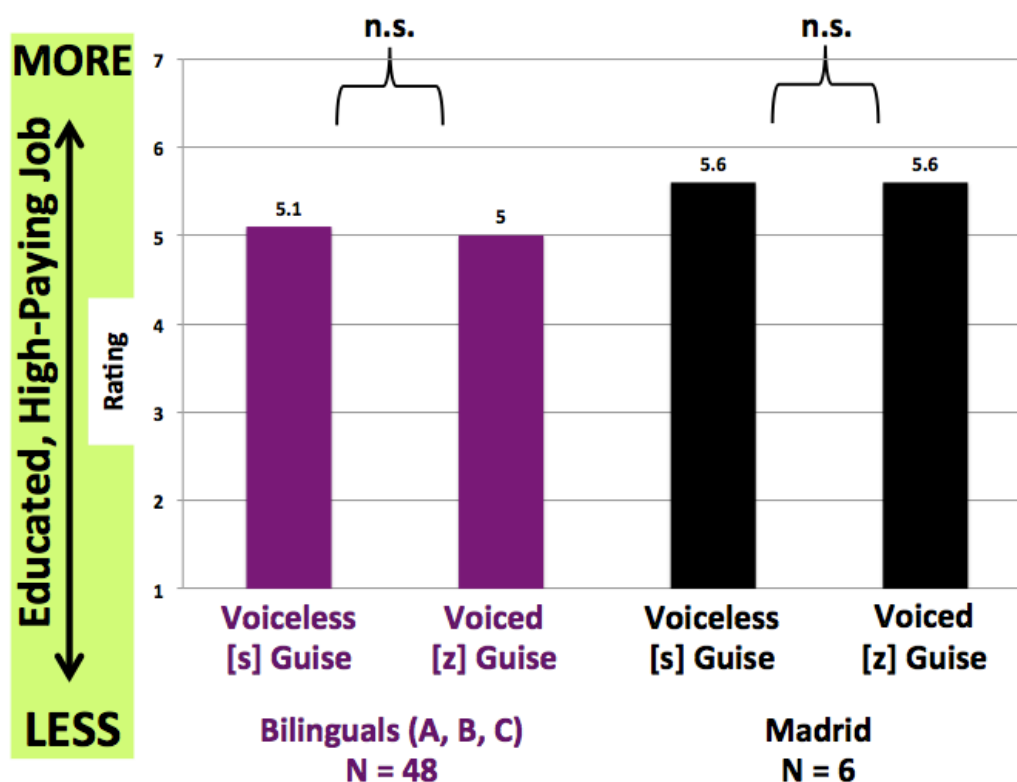
as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in power score between the voiceless and voiced guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 34 (note that negative β coefficients indicate lower power ratings [i.e., less educated, less likely to have a high-paying job] compared to the intercept). The ANOVA table generated from the mixed-effects model returned a significant effect of Catalan exposure group ($F[3,58] = 4.96, p=.004$), but no significant effect of guise ($F[1,50] = 0.18, p=.67$) nor any interaction between the two ($F[3,50] = 0.68, p=.57$). These results suggest that voiceless [s] and voiced [z] share equal associations with power in CCS, visualized below in figure 68.

Table 34 - Summary of Mixed-Effects Linear Regression Model Fitted to CCS /s/ Power Scores

	β	t	p
(Intercept)*	-0.30877	-2.067	0.04323
Group B	0.05299	0.251	0.80287
Group C	0.63585	3.009	0.00386
Group D	0.73005	2.552	0.01336
Voiceless Guise	0.03532	0.427	0.67151
Group B : Voiceless Guise	0.10597	0.905	0.36983
Group C : Voiceless Guise	-0.05299	-0.452	0.65289
Group D : Voiceless Guise	-0.03532	-0.223	0.82461

*The intercept is group A speakers rating the voiced guise.
The estimated variance of the random effect of speaker is 0.30231.

Figure 68 - Power Score Differences for Voiceless and Voiced Guises



Parallel results (i.e. the lack of any significant difference in power attributions between the voiceless and voiced guises) were found from the non-scaled power questions on the matched guise questionnaire, namely regarding if the speaker seemed hard-working or lazy, if the speaker seemed rich or poor, if the speaker seemed educated or uneducated, and the kind of job the speaker held (lower class vs. middle class vs. higher class). Note that the option of responding “I don’t know” (or simply not selecting a response) was available for these items, and accordingly the majority of participants chose this option. Chi-square tests run on the proportion responses given for the voiceless guise and voiced guise revealed no significant difference in response types across the guises for any of the power items (for hard-working vs. lazy, $\chi^2=0.0001$, $df=1$, $p=1$ [with Yates’ correction]; for rich vs. poor, $\chi^2=0.5$, $df=1$, $p=.91889$ [with Yates’ correction]; for educated vs. uneducated, $\chi^2=0.485$, $df=1$, $p=.49617$ [with Yates’ correction]; for job type, $\chi^2=1.514$, $df=2$, $p=.46907$). Tables 35, 36, 37, and 38,

along with figure 69 collectively show these parallel findings.⁹¹

Table 35 - Counts of ‘Hard-working’ vs. ‘Lazy’ Power Responses to Voiceless and Voiced Guises

Guise Type	# of ‘Hard-working’ Responses	# of ‘Lazy’ Responses	TOTAL
Voiceless Guise	2	4	6
Voiced Guise	3	3	6
TOTAL	5	7	12

Table 36 - Counts of ‘Rich’ vs. ‘Poor’ Power Responses to Voiceless and Voiced Guises

Guise Type	# of ‘Rich’ Responses	# of ‘Poor’ Responses	TOTAL
Voiceless Guise	2	0	2
Voiced Guise	2	0	2
TOTAL	4	0	4

Table 37 - Counts of ‘Educated’ vs. ‘Uneducated’ Power Responses to Voiceless and Voiced Guises

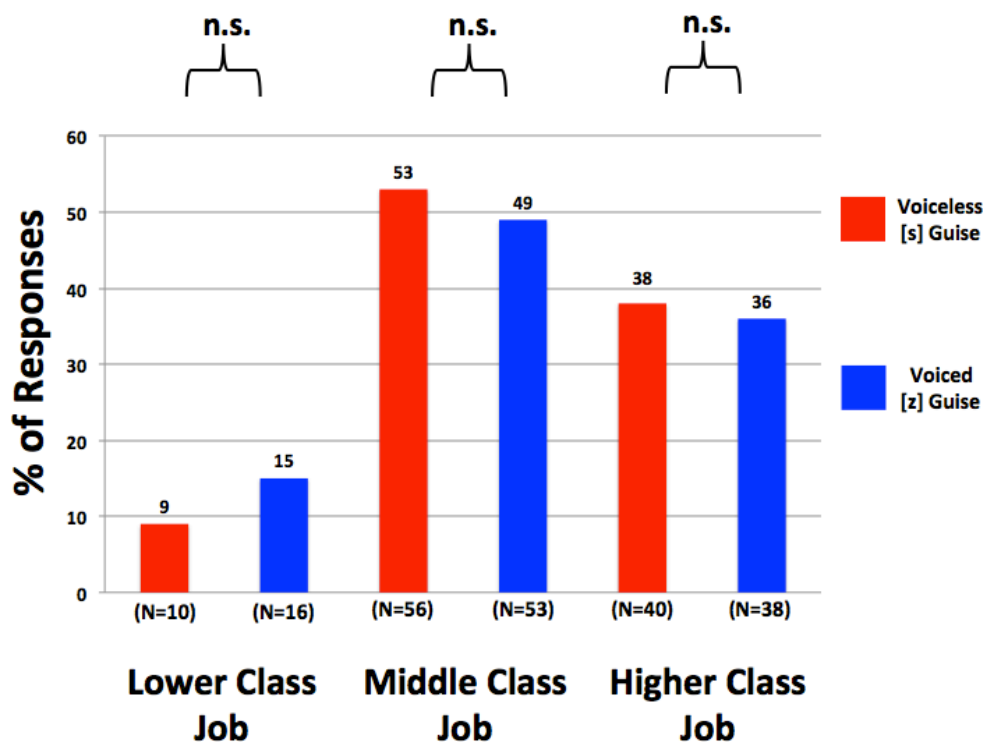
Guise Type	# of ‘Educated’ Responses	# of ‘Uneducated’ Responses	TOTAL
Voiceless Guise	32	1	33
Voiced Guise	33	1	34
TOTAL	65	2	67

Table 38 - Counts of Lower, Middle, and Upper Class Job Responses to Voiceless and Voiced Guises

Guise Type	# of Lower Class Responses	# of Middle Class Responses	# of Upper Class Responses	TOTAL
Voiceless Guise	10	56	40	106
Voiced Guise	16	53	38	107
TOTAL	26	109	78	213

⁹¹ Visualizations of the data from tables 35, 36, and 37 are not provided due to the relatively low counts (i.e., graphs of these tables would be misleading). Additionally, note for table 38 and figure 69 that there were 3 jobs offered as choices for each of the three job class categories, allowing for a single subject to indicate, per guise, as many as 9 responses.

Figure 69 - Percentages of Lower, Middle, and Upper Class Job Responses to Voiceless and Voiced Guises



In order to test for differences in accent ratings (i.e., if the speaker spoke Spanish well and had a pretty accent), a linear mixed-effects regression was run in R using accent score as the dependent variable, testing for a fixed main effect of guise (voiceless guise vs. voiced guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in accent score between the voiceless and voiced guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 39 (note that negative β coefficients indicate lower accent ratings [i.e., spoke Spanish less well, had a less pretty accent] compared to the intercept). The ANOVA table generated from the mixed-effects model returned a significant effect of Catalan exposure group ($F[3,58] = 3.01, p=.04$), but no significant effect of guise ($F[1,50] = 0.61, p=.44$) nor any interaction between the two ($F[3,50] = 0.75, p=.53$). These results

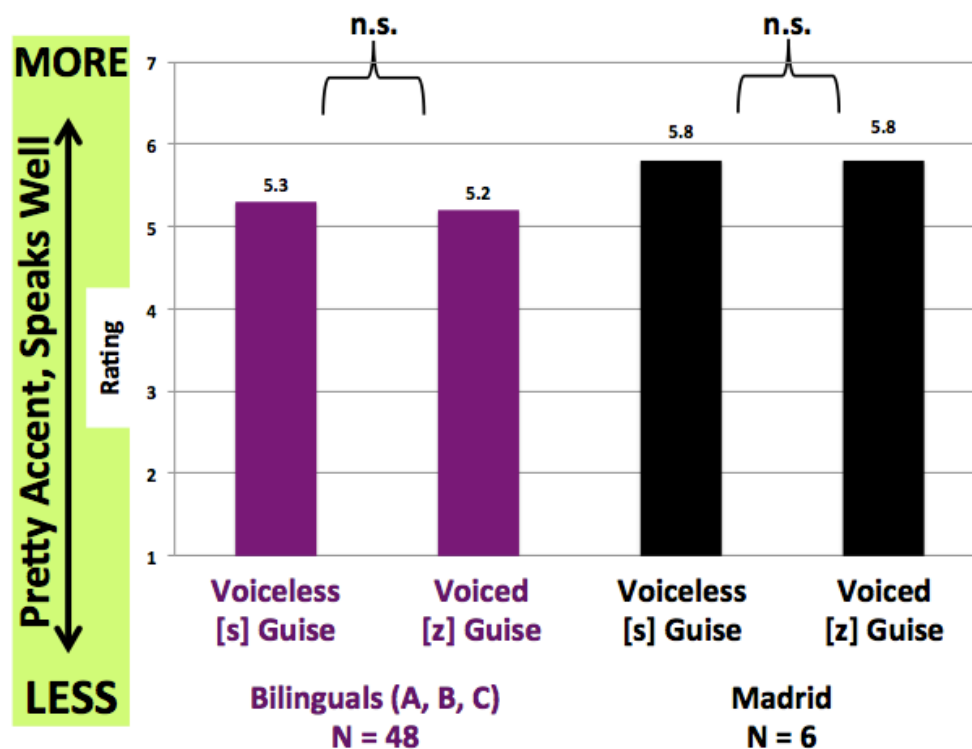
suggest that voiceless [s] and voiced [z] do not differ with respect to how correct, pretty, or proper they sound in CCS, visualized below in figure 70.

Table 39 - Summary of Mixed-Effects Linear Regression Model Fitted to CCS /s/ Accent Scores

	β	t	p
(Intercept)*	-0.40144	-2.284	0.026
Group B	0.36618	1.473	0.1461
Group C	0.6103	2.456	0.0171
Group D	0.84628	2.515	0.0147
Voiceless Guise	-0.07324	-0.778	0.4401
Group B : Voiceless Guise	0.17088	1.284	0.2051
Group C : Voiceless Guise	.017088	1.284	0.2051
Group D : Voiceless Guise	0.07324	0.406	0.6862

*The intercept is group A speakers rating the voiced guise.
The estimated variance of the random effect of speaker is 0.42323.

Figure 70 - Accent Score Differences for Voiceless and Voiced Guises



In order to test for differences in rurality ratings (i.e., if the speaker seemed to be from a village), a linear mixed-effects regression was run in R using rurality score as the dependent variable, testing for a fixed main effect of guise (voiceless guise vs. voiced guise) as well as

an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in rurality score between the voiceless and voiced guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 40 (note that negative β coefficients indicate higher rurality ratings [i.e., more likely to be from a village] compared to the intercept). The ANOVA table generated from the mixed-effects model returned no significant main effects,⁹² suggesting that intervocalic /s/-voicing simply has no covert associations with rurality (or a lack of rurality). This lack of effect is illustrated below in figure 71.

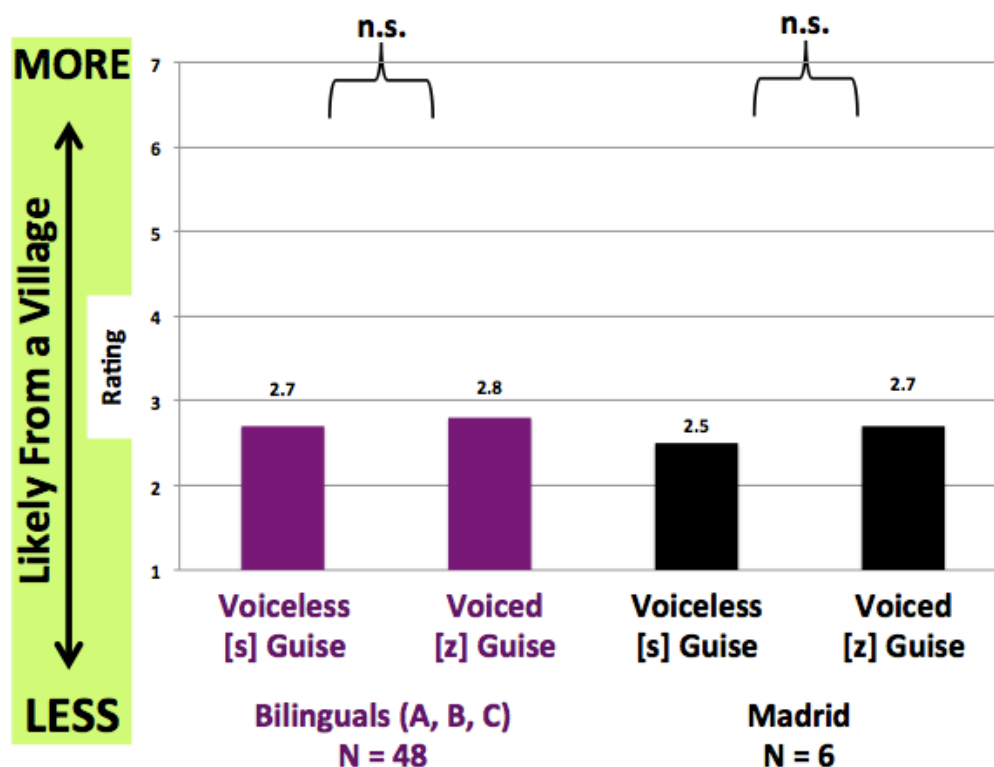
Table 40 - Summary of Mixed-Effects Linear Regression Model Fitted to CCS /s/ Rurality Scores

	β	t	p
(Intercept)*	-0.5779	-2.373	0.0212
Group B	0.7673	2.228	0.03
Group C	0.8185	2.377	0.021
Group D	0.6309	1.353	0.1816
Voiceless Guise	0.1023	1.007	0.3189
Group B : Voiceless Guise	-0.1023	-0.712	0.4799
Group C : Voiceless Guise	-0.00001	0	1
Group D : Voiceless Guise	0.0341	0.175	0.8616

*The intercept is group A speakers rating the voiced guise.
The estimated variance of the random effect of speaker is 0.86587.

⁹² Note the lack of statistical significance: for Catalan exposure and use groups, $F[3,55] = 2.38$, $p=.08$; for guise, $F[1,50] = 1.01$, $p=.32$; and for the interaction between guise and Catalan exposure and use groups, $F[3,50] = 0.28$, $p=.84$.

Figure 71 - Rurality Score Differences for Voiceless and Voiced Guises



In order to test for differences in bilingualism ratings (i.e., if the speaker spoke Catalan), a linear mixed-effects regression was run in R using bilingualism score as the dependent variable, testing for a fixed main effect of guise (voiceless guise vs. voiced guise) as well as an interaction between guise and Catalan exposure and usage group (group A vs. group B vs. group C vs. group D) in order to verify that any significant difference in bilingualism score between the voiceless and voiced guises was consistent across the four speaker groups. Subject was incorporated as a random effect. The results of the linear mixed-effects regression appear below in table 41 (note that negative β coefficients indicate lower accent ratings [i.e., less likely to be a Catalan speaker] compared to the intercept). The ANOVA table generated from the mixed-effects model returned significant main effects of Catalan exposure group ($F[3,74] = 5.84, p=.001$), guise ($F[1,50] = 18.57, p<.0001$), and a significant interaction between the two ($F[3,50] = 4.43, p=.008$).

Table 41 - Summary of Mixed-Effects Linear Regression Model Fitted to CCS /s/ Bilingualism

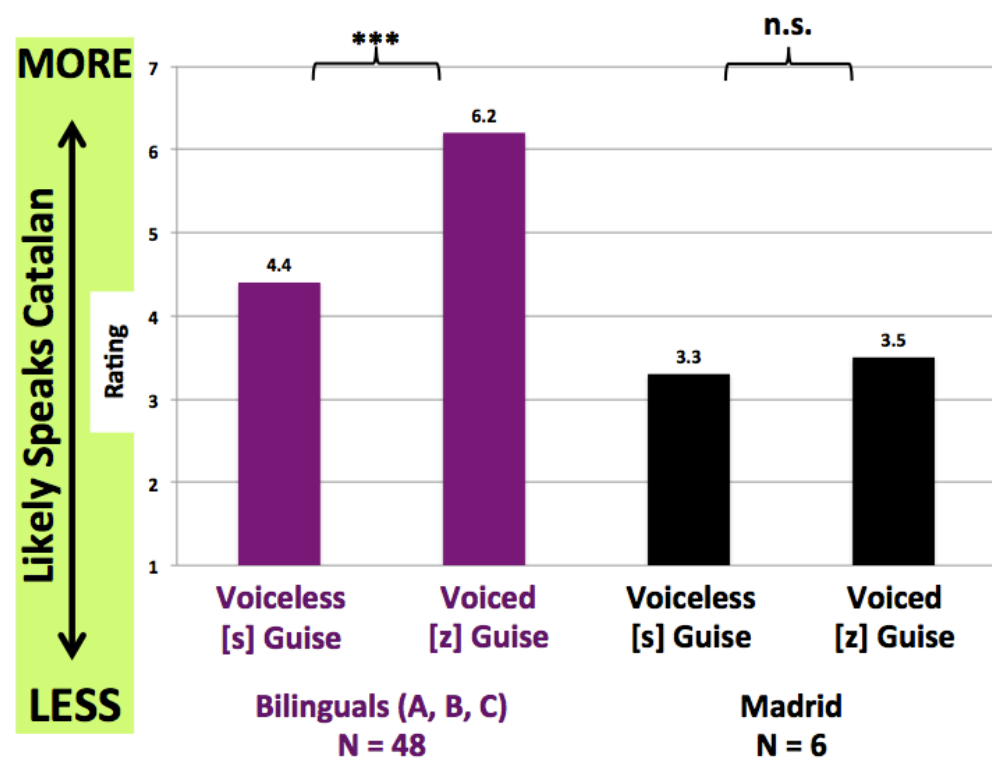
Scores

	β	t	p
(Intercept)*	0.8698	4.174	<.0001
Group B	-0.3753	-1.273	0.2069
Group C	-0.5316	-1.804	0.0753
Group D	-1.6574	-4.154	<.0001
Voiceless Guise	-0.8131	-4.309	<.0001
Group B : Voiceless Guise	-0.5003	-1.875	0.0666
Group C : Voiceless Guise	0.1564	0.586	0.5605
Group D : Voiceless Guise	0.7297	2.02	0.0488

*The intercept is group A speakers rating the voiced guise.
The estimated variance of the random effect of speaker is 0.4099.

As the only statistical comparisons of relevance to our research questions are those concerned with whether or not each group of speakers differentiated the voiceless and voiced guises by solidarity score, we limit our discussion of results to the significant interaction between guise and Catalan exposure and use group. Post-hoc analyses (with Bonferroni correction [alpha level = 0.0125]) revealed that all three bilingual groups (A, B, and C) attributed significantly higher bilingualism scores to the voiced guise over the voiceless guise (for A and B, $p < .0001$; for C, $p = .001$), whereas the Madrid group uniquely rated the two guises equally ($p = .788$). These findings, suggesting that voiced [z] is covertly associated with the Catalonian identity of the speaker within the community of CCS bilinguals, are visualized below in figure 72.

Figure 72 - Bilingualism Score Differences for Voiceless and Voiced Guises



Parallel results (i.e. significant differences in bilingualism attributions between the voiceless and voiced guises) were found from the non-scaled bilingualism questions on the matched guise questionnaire, namely regarding if the speaker spoke any other language than Spanish, and where the speaker most likely learned Spanish. Chi-square tests run on the proportion responses given for the voiceless guise and voiced guise revealed significant differences in response types across the guises for both of the bilingualism items (for languages spoken beyond Spanish, $\chi^2=13.752$, $df=1$, $p=.0002086$; for location of Spanish acquisition, $\chi^2=18.025$, $df=1$, $p=.0000218$). Post-hoc cell-wise comparisons revealed that a significantly greater proportion of responses of ‘Catalan’ and ‘Catalonia’ (respectively regarding other languages spoken and the region where Spanish was acquired) were attributed to the voiced guise over the voiceless guise. Tables 42 and 43 along with figures 73 and 74 collectively show these parallel findings, indicative of the status of [z] as a marker of CCS.

Table 42 - Counts of ‘Catalan’ vs. ‘None’/Other Bilingualism Responses to Voiceless and Voiced Guises

Guise Type	# of ‘Catalan’ Responses	# of ‘None’/Other Responses	TOTAL
Voiceless Guise	22	32	54
Voiced Guise	41	13	54
TOTAL	63	45	108

Figure 73 - Percentages of ‘Catalan’ vs. ‘None’/Other Bilingualism Responses to Voiceless and Voiced Guises

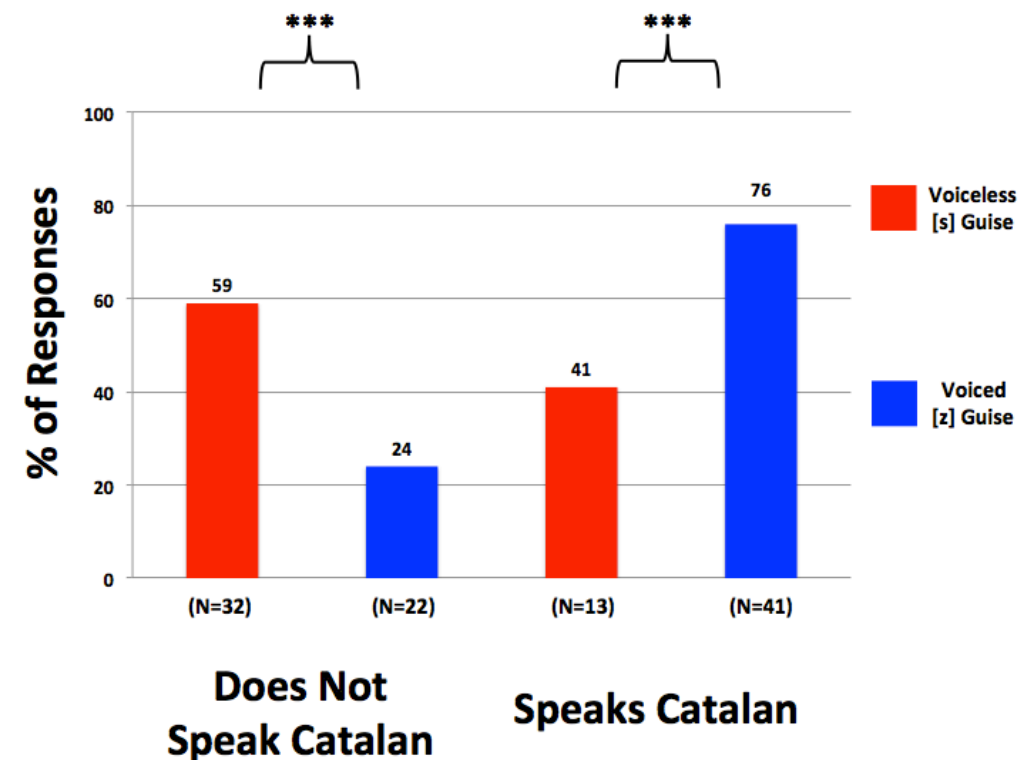
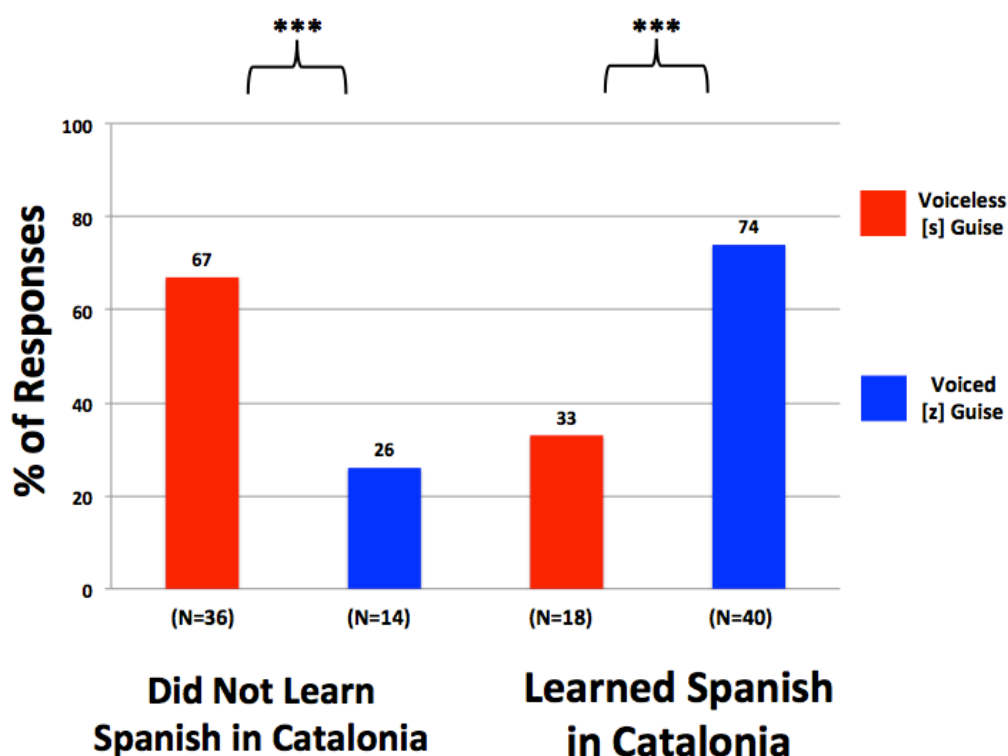


Table 43 - Counts of ‘Catalonia’ vs. Non-Catalan Territory Bilingualism Responses to Voiceless and Voiced Guises

Guise Type	# of ‘Catalonia’ Responses	# of Non-Catalan Territory Responses	TOTAL
Voiceless Guise	18	36	54
Voiced Guise	40	14	54
TOTAL	58	50	108

Figure 74 - Percentages of ‘Catalonia’ vs. Non-Catalan Territory Bilingualism Responses to Voiceless and Voiced Guises



Finally, the remaining two non-scaled items on the matched guise questionnaire both related to the perception of age. The first item asked subjects to estimate the speaker’s age (12-18 vs. 18-25 vs. 25-30 vs. 30s vs. 40+), whereas the second item asked participants to choose whether or not the guise speaks like young people or elderly people (with “I don’t know” as an alternative option). Chi-square tests run on the proportion responses given for the

voiceless guise and voiced guise revealed no significant difference in response types across the guises for either age-related item (for age estimation, $\chi^2=0.538$, $df=2$, $p=.76414326$ [with Yates' correction]; for young vs. elderly speech, $\chi^2=0.004$, $df=1$, $p=.094957$ [with Yates' correction]). In spite of the previously reported significant age effect whereby intervocalic /s/-voicing for CCS speakers was stronger in the younger generation of bilinguals than the older generation, the present matched guise findings suggest that there is no covert awareness of this generational (or age-related) trend regarding voiced [z] and voiceless [s] in CCS. Tables 44 and 45, along with figures 75 and 76 collectively visualize these present findings.

Table 44 - Counts of Age Estimation Responses to Voiceless and Voiced Guises

Guise Type	# of '12-18' Responses	# of '18-25' Responses	# of '25-30' Responses	# of '30s' Responses	# of '40+' Responses	TOTAL
Voiceless Guise	1	27	26	0	0	54
Voiced Guise	1	25	28	0	0	54
TOTAL	2	52	54	0	0	108

Figure 75 - Percentages of Age Estimation Responses to Voiceless and Voiced Guises

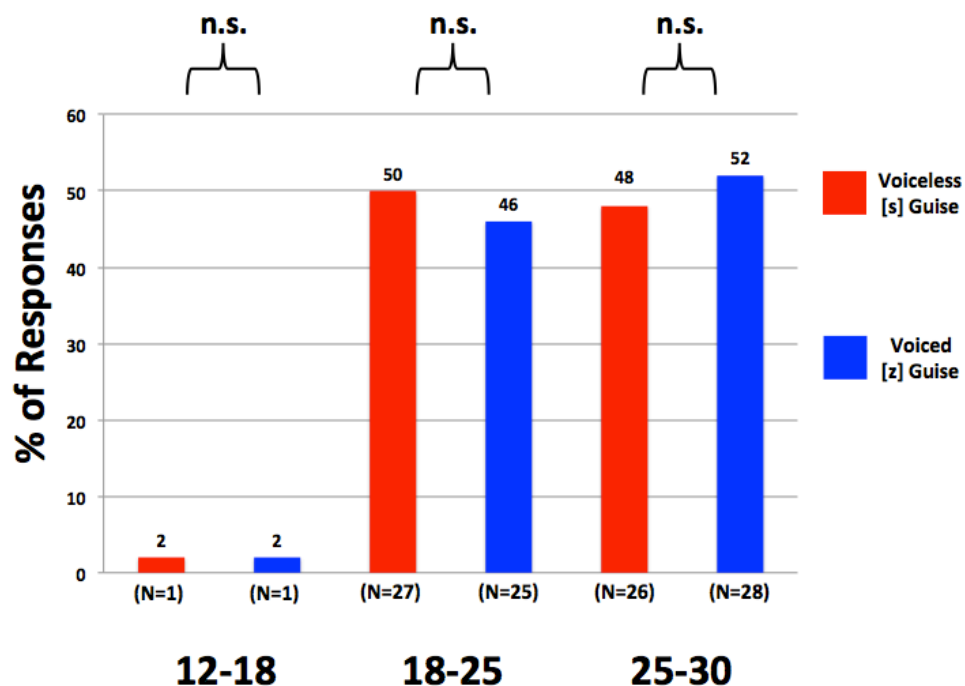
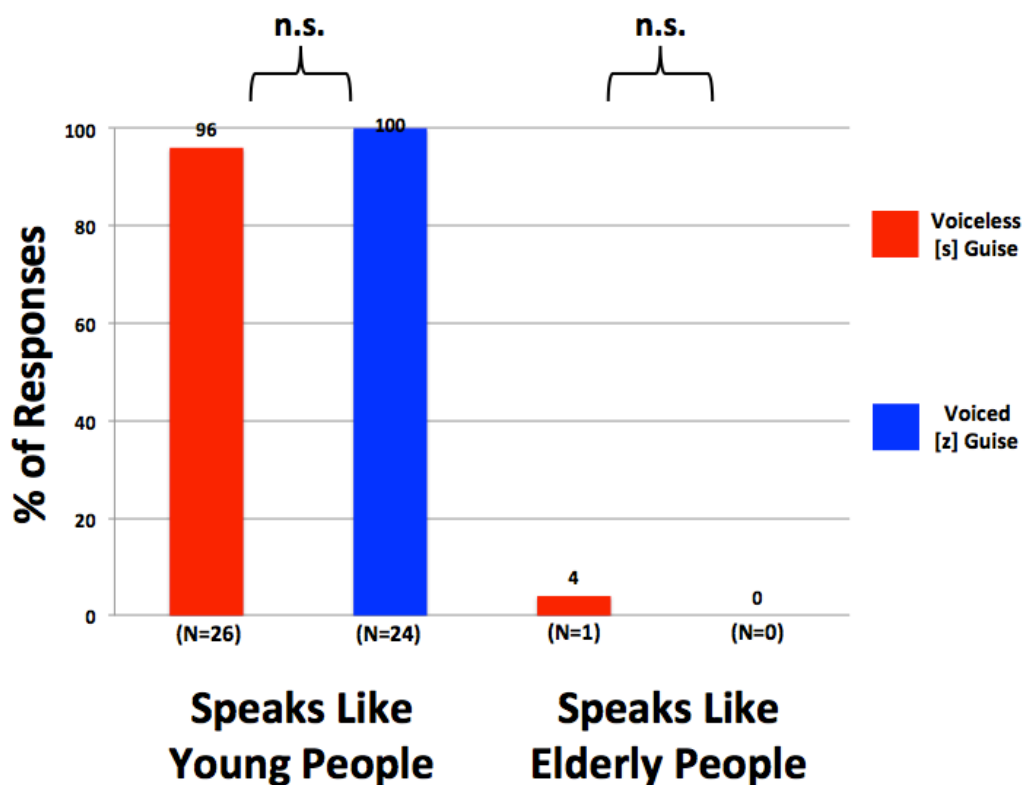


Table 45 - Counts of ‘Like Younger People’ vs. ‘Like Elderly People’ Responses to Voiceless and Voiced Guises

Guise Type	# of ‘Like Younger People’ Responses	# of ‘Like Elderly People’ Responses	TOTAL
Voiceless Guise	26	1	27
Voiced Guise	24	0	24
TOTAL	50	1	51

Figure 76 - Percentages of ‘Like Younger People’ vs. ‘Like Elderly People’ Responses to Voiceless and Voiced Guises



Summarizing the results of the matched guise experiment with respect to intervocalic [s] and [z], covert attitudes suggest a purely positive social esteem for CCS intervocalic /s/-voicing on the part of CCS bilinguals. CCS speakers showed an affinity toward the use of [z] when it came to solidarity attributes, and additionally associated voiced [z] with the bilingual and Catalanian identity of the guise. Accordingly, it can be inferred that the positive solidarity

attributes on the part of CCS bilinguals indicate a sense of shared identity with the guise, absent for Madrid speakers. Furthermore, no covert associations with age, power, rurality, or accent (i.e., proper Spanish, pretty accent) were found. In total, these findings appear congruent with the elicited production trends for intervocalic fricative voicing. The considerable extension of a ‘Catalan-like’ voiced fricative within the Catalan-dominant communities, alongside the gender and age effects favoring greater degrees of /s/-voicing in the younger female bilinguals, are consistent with the lack of any covertly negative associations with [z]. Moreover, as even Spanish-dominant bilinguals maintain a degree of intervocalic fricative voicing that is significantly stronger than that found in Madrid Spanish, this feature may act as a linguistic resource with which Spanish-dominant bilingual speakers align themselves with the greater bilingual CCS community (cf. Sinner 2002: 162; Vann 2007: 253, 271). We will return to this analysis after reviewing the (overt) attitudes and opinions expressed in the debriefing interviews.

5.2.2. Overt Attitudes Toward CCS and CCS Fricatives

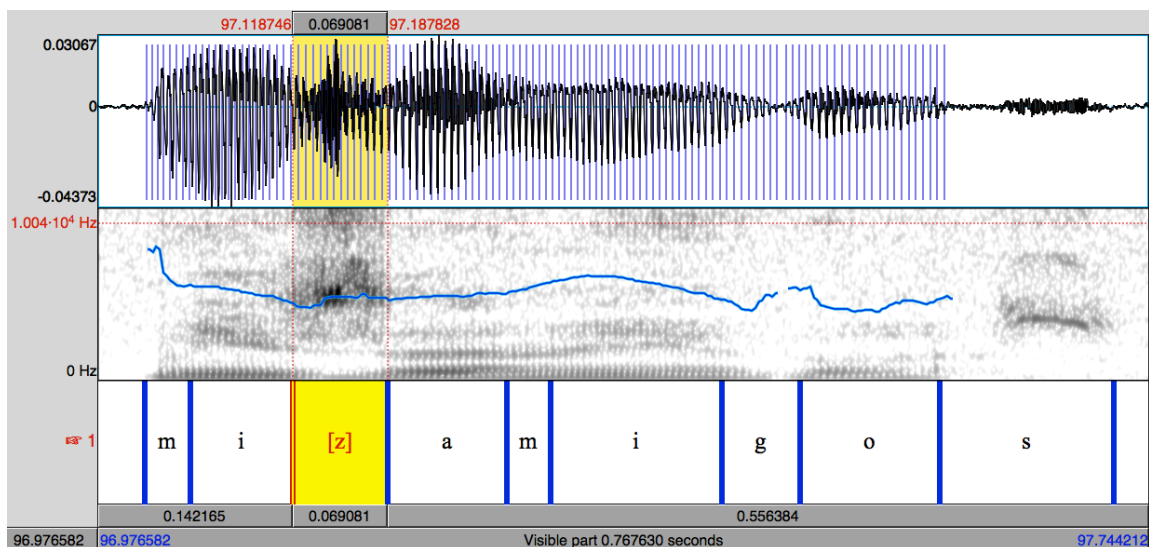
The purpose of the debriefing interview was to elicit overt attitudes and opinions toward voiceless and voiced intervocalic fricatives in CCS, as well as toward ‘Catalanized’ Spanish more generally. Since the discussion of attitudes toward ‘Catalanized’ Spanish and the CCS sound features of which participants were most aware appeared previously in section 4.2.2, we will presently focus overt attitudes towards [z] and [s] in CCS.

With respect to overt attitudes towards voiceless and voiced fricatives, recall from figure 45 in section 4.2.2 that intervocalic /s/-voicing was the CCS phonetic feature with the least amount of overt awareness. The overwhelming lack of overt awareness of intervocalic /s/-voicing as a feature of bilingual CCS speech resulted in speakers simply not expressing any overt opinions about this feature (in contrast to their statements regarding *la ele catalana*,

for example). Furthermore, even when explicitly prompted to think about any possible ‘Catalanized’ way of pronouncing the phrase *mis amigos* ‘my friends,’ participants were overall simply not aware of the voicing of the word-final /s/ as a feature of CCS. One particularly interesting exchange occurred with subject 11 (Group A younger female), who repeated *mis amigos* aloud to herself, trying to think if there was any way in which she could pronounce the phrase more ‘Catalan-like.’ Figure 77 below shows the spectral analysis of the word-final prevocalic /s/ in *mis amigos* as subject 11 was thinking aloud. Despite producing /s/ as a fully voiced [z], she was ironically still unaware of [z] being a feature of CCS speech:

- “‘*Mis amigos*’ ... *No sé, es que como yo siempre me oigo a mí, bueno, sabes... no... no lo sé* [‘My friends’ ... I don’t know, it’s that since I always hear myself, well, you know... no... I don’t know]” (Subject 11, younger village female).

Figure 77 - Speaker 11 (Group A, younger female) Rendition of *mis amigos* ‘my friends’ (100% voiced)



Given the minimal overt awareness of intervocalic [z] as a feature of CCS, as well as the positive covert associations with solidarity and the Catalonian identity of the speaker, we propose that CCS [z] is not as salient a marker of CCS as velarized [ɫ], and accordingly is likely not a CCS feature that causes one’s CCS accent to be considered ‘exaggerated’ or be

the source of negative overt commentary. This, in light of the observed age and gender effects, suggests that [z] has the possibility of diffusing (over time) across the CCS community, particularly to Spanish-dominant bilinguals.

5.3. Summary of Intervocalic Fricative Voicing Results

In this chapter, we have presented findings from the elicited production tasks in Spanish and Catalan, as well as those from the matched guise and debriefing interviews with respect to intervocalic fricative voicing in CCS. To best synthesize these results, we shall offer summary conclusions regarding each of the proposed research questions concerning intervocalic fricative voicing.

RQ1: To what extent is intervocalic fricative voicing present in modern Barcelonan CCS (as compared with non-contact, monolingual Spanish varieties)?

A comparison of voicing degrees between CCS bilinguals and Madrid monolingual speakers of Spanish revealed that a significantly stronger degree of intervocalic fricative voicing was found for all bilingual speakers, including Spanish-dominant bilinguals from Barcelona. These stronger degrees of voicing, though mediated by exposure and usage of Catalan, suggest that Spanish intervocalic fricatives in Barcelona are plainly distinct from intervocalic fricatives in Madrid Spanish, offering evidence in support of the classification of intervocalic fricative voicing in CCS as a contact innovation. Furthermore, word position effects were useful in highlighting two distinct patterns of intervocalic fricative voicing, mediated categorically by language dominance. ‘Catalan-like’ nearly fully voiced fricatives were categorically absent in word-initial position in Catalan-dominant speakers, and more generally were significantly favored in monolingual Madrid speech over CCS bilingual speech. Word-finally, however, the pattern was nearly perfectly reversed; Catalan-dominant

bilinguals showed considerable frequencies of ‘Catalan-like’ fricatives, and these nearly fully voiced fricatives were significantly favored in the speech of Catalan-dominant bilinguals over Spanish-dominant bilinguals and Madrid monolinguals.

Wesch (1997: 296) reported that intervocalic fricative voicing in Barcelona was a frequent phenomenon, but was not socially stratified. Parallel findings of a lack of social stratification for intervocalic fricative production in the CCS of Palma de Majorca were reported by Pieras (1999: 243-245). The present data, collected 15 years later, show a rather different set of trends. First, as previously mentioned, greater degrees of Catalan exposure and use were linked to greater degrees of intervocalic /s/-voicing, with select individuals in from both the village communities as well as Barcelona using ‘Catalan-like’ fricatives nearly categorically across both formal and casual speech styles. Younger CCS speakers, for whom intervocalic fricative voicing was stronger compared to older speakers, used ‘Catalan-like’ fricatives approximately 37% of the time (word-finally, which includes careful speech). ‘Catalan-like’ fricatives were used as a majority variant word-finally for several village and Catalan-dominant Barcelonan bilinguals, with frequencies of use ranging from 52% to 100%. Thus, we may conclude that word-final intervocalic [z] remains a very frequent feature in Barcelonan CCS, not strictly limited to village communities, and may become more frequent over time as indicated by the aforementioned effects of age and gender. Notably, since the majority of experimental items from the elicited production tasks came from the formal speech phrase-list readings, it is also important to consider that these high frequencies of ‘Catalan-like’ (word-final) fricatives were produced for most part in careful speech, suggesting that ‘Catalan-like’ (word-final) fricatives form a substantial part of the formal speech register and are most certainly not limited to casual speech in the BMA.

RQ2: What are the social (language-external) constraints affecting intervocalic fricative voicing in Barcelonan CCS?

Intervocalic fricative voicing was found to be mediated by a series of social factors in Barcelonan CCS, including Catalan exposure and use group, gender, style, and age. As mentioned earlier, the effect of Catalan exposure and use group directly evidences the influence that contact with Catalan has on the production of intervocalic fricatives in the Spanish of bilingual speakers.

Regarding an effect of gender, all bilingual groups exhibited a favoring of increased voicing degrees on the part of females in comparison with males. Following the *gender paradox* (cf. Labov 2001), females are expected to use standard features more when they are overtly proscribed. The lack of comments from the debriefing interviews regarding any overt stigma (much less even overt awareness) associated with CCS [z] suggests that there is no such proscribed overt norm disfavoring [z] in the bilingual CCS community, and accordingly we interpret the gender effect evidenced in our data as an instantiation of female speakers acting as innovators, adopting a non-standard feature that holds no negative social value. This interpretation is furthermore corroborated the style effect evidenced for all bilingual speakers, in that greater degrees of intervocalic fricative voicing were used less in careful speech. This style correlate, the covert association of [z] with Catalan and Catalonian identity, and the lack of negative covert and overt associations with CCS [z] all suggest that CCS [z] is a *linguistic marker* (cf. Labov 1972; 2001).⁹³

The present finding of an age effect favoring greater voicing degrees in the younger generation of CCS bilinguals is suggestive of the possibility for CCS [z] (at least word-finally) to continue to propagate throughout the bilingual community, particularly in the Spanish-dominant population, who presently use ‘Catalan-like’ fricatives significantly less

⁹³ Since social class was not incorporated into this study, this interpretation of intervocalic [z] as a linguistic marker relies on the social correlate with Catalan language use and exposure groups (i.e., Catalan-dominant bilinguals voice more than Spanish-dominant bilinguals, who in turn voice more than Spanish monolinguals). Still, it is worth noting that it is difficult to presently interpret the observed style correlate completely, teasing apart the effects of faster vs. slower speech rates (i.e., the structural components) from the social mechanisms underlying stylistic variation in fricative voicing.

than Catalan-dominant bilinguals. The social stratification of CCS [z] by gender, age, and Catalan-dominance are moreover a seemingly recent development in Barcelonan CCS, since none of the social factors taken into consideration by Wesch (1997) for Barcelonan CCS, namely age and social class, were found to be linked with [z] production. Likewise, CCS [z] production in Palma de Majorca (cf. Pieras 1999) was not found to be stratified by age, gender, nor language dominance.

RQ3: What are the linguistic (language-internal) constraints affecting intervocalic fricative voicing in Barcelonan CCS?

Intervocalic fricative voicing was found to be mediated by a series of linguistic factors in Barcelonan CCS, including word position, word class, and stress. With respect to word position, intervocalic fricative voicing was stronger in word-final contexts than word-initial contexts. Although the favoring of word-final voicing over word-initial voicing has been previously found in monolingual Madrid Spanish (cf. Hualde & Prieto 2014; Torreira & Ernestus 2012) and can be accounted for by appealing to endogenous mechanisms within articulatory phonology (cf. Nam et al. 2009, as cited in Hualde & Prieto 2014: 123), the effect of word position in the present study was only attested in bilingual CCS speech. Moreover, this effect was outright categorical for Catalan-dominant bilinguals, in comparison with Madrid Spanish speakers who used ‘Catalan-like’ fricatives word-initially significantly more than each of the CCS bilingual groups. Accordingly, we propose that the word position effect observed in our data, while consistent with language universals regarding stronger lenition word-finally vs. word-initially, crucially evidences the influence of Catalan phonotactics (interpreted in terms of the barring of phonetic [z] imposition in sites of Catalan phonemic voicing contrast) on CCS fricative production.

With respect to word class, the Catalan-dominant groups exhibited greater voicing degrees with open class words (e.g. nouns and verbs) than closed class words (e.g.

determiners and prepositions), replicating a parallel finding for Barcelonan CCS reported by Davidson (2012b: 31-32, 45; 2014a: 237-238; forthcoming). The present findings suggest that for those speakers for whom intervocalic fricative voicing is the most frequent, this voicing is applied the most to nouns and verbs, rather than determiners and prepositions. A differentiation based on word class is common in sound change phenomena (Bybee 2002; Pierrehumbert 2001), and accordingly the present study suggests that prepositions and determiners may be a less salient as well as less common context for intervocalic fricative voicing than open class words such as nouns and verbs.

Lastly, with respect to stress, a significant effect favoring increased intervocalic fricative voicing in unstressed contexts over stressed contexts was found for all speakers, bilingual and monolingual alike. A stress effect in this direction is predictable within gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995) as an effect of hyper-articulation across longer stressed-syllable sequences in Spanish (Hualde 2005: 244; 2014: 251), which facilitates the coordination of glottal (voicing) gestures across the vowel-/s/-vowel sequence. Accordingly, this effect is most reasonably interpretable as a purely endogenous factor (i.e., structural motivation internal to Spanish), independent of Catalan with Catalan.

RQ4: Is there evidence of the diffusion of CCS voiced [z] across the bilingual Catalan-Spanish speech community? If so, is this diffusion ongoing (i.e., is there evidence of a linguistic change in progress)?

As previously mentioned, a significant effect of age was found for CCS bilinguals such that the younger generation of bilinguals used stronger degrees of fricative voicing than the older generation of bilinguals. Within an apparent time construct (cf. Bailey 2004; Bailey, Wikle, Tillery, & Sand 1991; Chambers 2004; Labov 1963; 1972; Sankoff & Blondeau 2007), this could be interpreted as a change in progress whereby more strongly voiced fricatives are being used more often over time. An account for such a change in progress relates to strong

degrees of voicing being a relatively non-salient feature of CCS speech that is covertly associated positively with solidarity attributes and the Catalanian identity of the speaker, which is not the subject of any overt negative social commentary within or outside of the bilingual CCS community.

The presently observed frequencies of ‘Catalan-like’ fricative usage across Catalan exposure and usage groups offer insight into the emergence of this feature. The emergence of a discretely voiced [z] in Barcelonan CCS appears to have begun in the speech of Catalan-dominant bilinguals, as these are the speakers for whom ‘Catalan-like’ fricatives (word-finally) are most frequently the majority variant. Several speakers in groups A and B use ‘Catalan-like’ (word-final) fricatives at categorical or near-categorical rates, across both casual and formal speech styles, suggesting that this feature has experienced some degree of diffusion within these Catalan-dominant speech communities. Within the Spanish-dominant bilingual community, however, ‘Catalan-like’ [z] productions do not show signs of having significantly diffused as a majority variant. Still, since voicing degrees of all bilingual groups were found to be significantly stronger than those of Madrid monolinguals, this suggests that even within the Spanish-dominant bilingual community, intervocalic [z] has been adopted by enough speakers that the overall voicing degrees between Madrid Spanish and Spanish-dominant CCS are significantly distinct.

RQ5: What are the overt and covert social evaluations of CCS intervocalic voiced [z]? How do these relate to social evaluations of “Catalanized Spanish” more generally? Additionally, how are differences in social values between the variants manifested in the paths of selection and propagation of each variant?

Covert attitudes toward CCS [s] and [z] elicited from the matched guise revealed that [z] is positively associated with solidarity traits and linked to Catalanian identity and the Catalan language within the CCS bilingual community. Moreover, unlike CCS velarized [ɣ], [z] is not

covertly associated with any negative attributes such as improper or incorrect Spanish. In the absence of any associations with age or power attributes, it can be reasoned that the positive affinity (in terms of solidarity) toward [z] on the part of CCS bilinguals relates precisely to a feeling of closeness and shared Catalanian identity with the speaker, which is not shared by monolingual Madrid speakers outside of the bilingual community. This assessment is furthermore supported by overt attitudes from many bilingual speakers regarding the positive sense of closeness they feel when hearing CCS. Still, overt awareness of [z] as a marker of CCS speech is rather low. A small minority (only four) of participants recognized [z] as a CCS feature, and the rest had no overt awareness of it even after being specifically prompted to consider phrases such as *mis amigos* ‘my friends’ with respect to CCS features. Therefore, we propose that CCS [z] is a *linguistic marker* (cf. Labov 1972; 2001) of Barcelonan CCS, with relatively little overt awareness, no salient social stigma attached to it, a style correlate, and social stratification with respect to Catalan exposure and use (as well as age and gender).⁹⁴ Accordingly, participants’ commentary regarding the overt ridicule of an ‘overly Catalanized’ variety of Spanish likely does not relate to [z] usage, which may facilitate the continued adoption of greater voicing degrees throughout the CCS bilingual community, and in particular by Spanish-dominant bilinguals.

With respect to links between the status and perceptions of CCS [z] and processes of selection and propagation, it was found that the most Catalan-dominant bilinguals use (and likely originated) CCS. Nonetheless, particularly when compared with CCS [ʃ] production, intervocalic /s/ voicing on the part of Spanish-dominant speakers (and even Catalan-dominant bilinguals in the urban capital) is still a somewhat frequent feature. Accordingly, we may propose that the status of CCS [z] as non-stigmatized (and generally below the level

⁹⁴ Echoing footnote 93, recall that the classification of intervocalic [z] as a linguistic marker substitutes the correlation with social class (used in monolingual communities) with that of Catalan exposure and use groups, particular to the presently studied bilingual setting.

of overt awareness) is more conducive (or more permissive) to the selection and diffusion of nearly fully voiced [z] productions from Catalan-dominant bilinguals to Spanish-dominant bilinguals.

RQ6: What evidence is there to support an account of CCS voiced [z] as contact-induced? What evidence exists in favor of an endogenous account?

As Catalan /z/ and word-final prevocalic /S/ were shown to be significantly more voiced than Spanish (word-final) intervocalic fricatives, the fact that degrees of CCS fricative voicing were found to be strongest with increased exposure and usage of Catalan suggests that Catalan is acting as the source language in a case of phonetic transfer to Spanish. Moreover, the qualitatively distinct patterns of word position effects across the Catalan exposure and usage groups evidence influences from Catalan phonotactics as most prevalent in the most Catalan-dominant bilinguals. More specifically, Catalan-dominant bilinguals were found to categorically avoid ‘Catalan-like’ fricatives word-initially, whereas Madrid monolinguals (and to a significantly lesser extent, Spanish-dominant bilinguals) were found to use ‘Catalan-like’ fricatives word-initially in casual speech at relatively low (though nonetheless substantive) frequencies. Thus, although the direction of this word position effect is parallel for all speakers and can be accounted for by appealing to endogenous (or non-contacted-induced) motivations within articulatory phonology (cf. Nam et al. 2009, as cited in Hualde & Prieto 2014: 123), the categorical barring of extremely voiced /s/ productions by Catalan-dominant bilinguals in word-initial contexts suggests that Catalan phonotactic constraints (i.e., structural motivations internal to Catalan) are indeed operating in Barcelonan CCS.

In addition to evidence supporting the contact-induced innovation of CCS [z], however, a linguistic constraint (beyond word position, as detailed above) was found to mediate intervocalic fricative voicing in parallel manners in both CCS and monolingual

Spanish, which suggests that structural forces internal (or specific) to Spanish also contribute to the overall dynamics of this phenomenon in CCS. In particular, CCS and monolingual Spanish fricatives were found to be significantly more voiced in unstressed contexts over stressed contexts. This stress effect is explained with gestural phonology (cf. Browman & Goldstein 1989; 1991) as an instantiation of hyper-articulation in stressed syllables, which have longer durations in Spanish (Hualde 2005: 244; 2014: 251). As this effect was found to operate in both CCS (i.e., a contact-variety of Spanish) and Madrid Spanish (i.e., a non-contact variety of Spanish), it can be reasoned that its presence in CCS is independent of contact with Catalan. Thus, we may conclude that intervocalic fricative voicing in CCS is jointly mediated by endogenous mechanisms in addition to phonetic contact influence from Catalan.

CHAPTER 6: DISCUSSION AND CONCLUSIONS

In this last chapter, we juxtapose the previously reported findings in chapters 4 and 5 regarding CCS lateral velarization and intervocalic fricative voicing in order to more specifically highlight the process and factors that we have found to mediate language variation and change in a contact setting. Additionally, we return to the discussion of empirically establishing language contact as a source for linguistic innovation (and possible change) by presenting an overview of the linguistic and social factors that we have shown to be influential in usage of CCS [ɫ] and [z]. Lastly, discuss how our findings illuminate our understanding of the evolution of the Spanish of Catalonia in relation to other contact varieties of Spanish, as well as monolingual varieties of Spanish, and offer suggestions for further research avenues.

6.1. Exploring Innovation and Diffusion in a Contact Setting

Catalan-dominant bilinguals were found to exhibit the strongest degrees of CCS lateral velarization and intervocalic fricative voicing, as well as the highest frequencies of use of ‘Catalan-like’ laterals and fricatives. These group-wide trends are useful for confirming that, in accordance with a situation of SL agentivity (cf. Van Coetsem 2000), those individuals most dominant in Catalan are those for whom phonetic transfer (or imposition) is most strongly attested.⁹⁵ We would expect that as the innovators of CCS [ɫ] and [z], Catalan-dominant bilinguals would comprise the largest group of speakers that use [ɫ] and [z] as a majority variant. Figures 32 and 63 respectively showed that indeed, groups A and B had the most (and only) users of ‘Catalan-like’ laterals and word-final intervocalic fricatives with

⁹⁵ Moreover, the overt stereotype of CCS dark [ɫ] as *la ele catalana* indicates that within and outside of the CCS bilingual community, CCS [ɫ] is widely considered an intrinsically Catalan feature.

usage rates above 50%. However, whereas there were an equal amount of word-final ‘Catalan-like’ fricative users (with over 50% usage rates) in groups A and B, there were more than double the amount of ‘Catalan-like’ lateral users (with over 50% usage rates) in group A than in group B. That is, within the Catalan-dominant population, majority usages of ‘Catalan-like’ laterals are considerably less common than majority usages of ‘Catalan-like’ word-final fricatives. Moreover, in speech of Spanish-dominant bilinguals, each participant’s usage rates of ‘Catalan-like’ word-final fricatives is generally at least twice that for ‘Catalan-like’ laterals. Accordingly, we may conclude that within the CCS bilingual community as a whole, the process of diffusion of more extremely voiced word-final fricatives is more advanced than that of extremely velarized laterals.⁹⁶ Nevertheless, for both features, it is important to note that several speakers acting as innovators (in the Catalan-dominant groups) use both features categorically or near-categorically.

These distinct degrees of propagation throughout the bilingual CCS community may be accounted for by appealing to both social and linguistic motivations. With respect to social factors moderating their degree of diffusion, recall that covert and overt attitudes toward CCS [ɸ] were negatively linked to associations with a less pretty and incorrect form of Spanish. In contrast, no such negative associations were linked to [z] production in CCS. Thus, the salient status of CCS [ɸ] as a linguistic stereotype (cf. Labov 1972; 2001) likely contributes to its lesser degree of diffusion throughout the CCS bilingual community than [z], which has little to no overt awareness. Moreover, age and gender effects in opposite directions for degrees of lateral velarization in comparison with intervocalic /s/-voicing further evidence the difference in social values attributed to each feature, as only the former has been found to be the subject of overt negative social commentary. In this way, our data demonstrate how

⁹⁶ It is worth noting that since lateral velarization is allophonic while syllable-initial fricative voicing) is phonemic, the adoption of voiced [z] from purely phonological grounds may be expected to be a slower, more cautiously advancing (or gradual) change than the adoption of dark [ɸ].

distinct social values afforded to different phonetic variants are reflected in non-parallel distributions of use amongst the population, suggestive of non-parallel paths of diffusion.

Still, however, when discussing lateral velarization not in terms of a concretely ‘Catalan-like’ lateral, but rather in terms of a gradient continuum of velarization, we are able to comment on an additional layer of complexity involved in the dynamics of phonetic transfer in this contact situation. Even if a ‘Catalan-like’ lateral is not used as a majority variant by any Spanish-dominant bilingual (in our sample, at least), the overall degree of lateral velarization for Spanish-dominant bilinguals was significantly greater than that for Spanish monolinguals from Madrid. This suggests that Spanish-dominant bilinguals have adopted some significant degree of lateral velarization that distinguishes them from monolinguals, even if their laterals are not as velarized as those produced by the innovating (Catalan-dominant) community. Accordingly, we propose that for phonetically gradient phenomena, such as lateral velarization, the variable of study with respect to the selection and propagation phase need not necessarily be a single, discrete sound, but instead be comprised of a continuum or range of discrete sounds.

Along this line of analysis, the diffusion of lateral velarization can be measured with respect to the degree to which individuals and/or groups in the community adopt laterals that are sufficiently velarized to distinguish them from the laterals produced by monolinguals (or other groups not part of the community in question). In this respect, CCS velarized laterals, understood as laterals that are significantly greater in velarization degree than those of monolingual Spanish speakers, already characterize the norm of CCS speech, and show additional gradient mediation by Catalan exposure and use, with the strongest of these uniquely CCS (velarized) laterals being produced most often by the Catalan-dominant population. The aforementioned (marginal) age effect, consequently, might not suggest that lateral velarization as a feature of CCS is on a trajectory to disappear (i.e., to become

gradually less and less velarized until velarization degrees no longer are uniquely higher for the CCS population), considering the positive solidarity attributes associated with both [ɫ] and CCS in general. Rather, a gradient reduction of velarization degree, over time, can possibly be enough to act as a linguistic response to the overt stigmatization of extremely velarized laterals, while nevertheless not necessarily ever constituting a decrease in velarization great enough to cause CCS laterals to no longer be uniquely more velarized in comparison to monolingual Spanish communities. Though the present findings have thus far found no differences in the degree of apparent-time reduction in velarization degree according to Catalan exposure and usage, future examination of lateral velarization in CCS, with an expanded subject pool for the older generation of speakers, would benefit from testing the hypothesis that the reduction in velarization degrees, over time, may be strongest in the most Catalan-dominant speakers, as these speakers are the ones that currently use the most extremely velarized (and thus most salient and stigmatized) laterals. This hypothesis would similarly predict that the Spanish-dominant bilinguals, whose laterals are not as velarized as those the Catalan-dominant community, may not reduce their degrees of lateral velarization as much as Catalan-dominant speakers, since their laterals are less velarized to begin with.⁹⁷

As for a possible linguistic account for the differences in diffusion degrees between lateral velarization and intervocalic /s/-voicing in the CCS community, we reiterate a prior argument expounded previously in footnote 52 in section 2.3. The very nature of lateral velarization and intervocalic fricative voicing, from a language acquisition perspective, is

⁹⁷ Though a parallel interpretation regarding the diffusion of intervocalic /s/-voicing as a continuum or range of voicing degrees could be equally proposed, the distribution of voicing degrees (as shown in figure 47) makes this a somewhat less practical approach. Spanish /s/ segments were overwhelmingly produced with very little voicing (0-30% voiced segment duration) or a very high degree of voicing (90-100% voiced segment duration). Accordingly, the increased velarization degrees over apparent time attested in our data set are most likely caused not by any small, gradual increase in voicing degrees, but instead by the gradual substitution of individual productions of /s/ that are realized with 0-30% voiced segment duration in one generation of speakers with /s/ productions that are realized with 90-100% voiced segment durations in a younger generation of speakers.

seemingly rather distinct. L1-Catalan speakers that acquire Spanish and L1-Spanish speakers that acquire Catalan are forced to acquire an allophonic lateral not existent in their first language, namely (and respectively) [l] or [ɫ] (cf. Flege 1995). In contrast, L1-Catalan speakers that acquire Spanish and L1-Spanish speakers that acquire Catalan do not acquire a new (alveolar) fricative allophone, since [s] and [z] already exist as native allophones in both languages (albeit to different phonemes). Accordingly, the case of intervocalic fricative voicing involves the acquisition of a new set of phonotactic rules, rather than the acquisition of a new or foreign sound. The difference scenarios of language acquisition, from a cognitive perspective, can suggest that the lesser degree of propagation of extremely velarized laterals in comparison with extremely voiced intervocalic fricatives relates to Spanish-dominant bilinguals, for example, not being capable of producing ‘Catalan-like’ laterals because they have not acquired the lateral [ɫ], whereas they are already capable of producing [z] because that sound already exists for them in Spanish. The present dissertation research was not designed to tease apart the “contributions of cognitive and social-indexical shaping forces in the behavior of bilingual individuals residing in bilingual speech communities” (Simonet 2010a: 676). Nevertheless, by studying both of these phenomena along scalar gradients of (respectively) velarization and voicing, we have been successful in showing that even if all bilingual speakers do not share the same lateral categories, they all show gradient movement in velarization degrees with the lateral categories they do have according to a variety of both linguistic and social factors.

6.2. Empirically Establishing Contact Innovations

In this dissertation, we have argued for the analysis of CCS lateral velarization and intervocalic fricative voicing as contact-induced phenomena, following the definition put forth by Thomason (2008: 47): “Contact is a source of linguistic change if it is less likely that

a given change would have occurred outside a specific contact situation.” Accordingly, a variety of both linguistic as well as social factors have been explored with respect to the variation present in the elicited CCS (and monolingual Spanish) production data for lateral velarization and intervocalic fricative voicing. Moreover, in sections 2.1.2 through 2.2.3 of chapter 2, an overview of several endogenous and contact sources for lateral velarization and intervocalic fricative voicing was offered. To synthesize all of these contributions, we present table 46 below, which organizes each piece of evidence (supporting an effect of an endogenous mechanism or an effect of language contact with Catalan) for each linguistic phenomenon⁹⁸ according to the parameters of contact-induced innovation proposed by Mougeon et al. (2005: 103-104), Poplack & Levey (2010: 398, 410), Poplack et al. (2012: 204), and Thomason (2001: 93-94; 2008: 49-50; 2010: 34). Entries in bold are those that have been empirically confirmed from the acoustic analyses performed on the CCS and Madrid Spanish data from this dissertation, whereas the unbolded entries reference other research previously detailed in sections 2.1.2 through 2.2.3.

⁹⁸ In terms of social factors evidencing either endogenous or contact sources for the variants under study, recall that the significant effect of Catalan usage and exposure groups on both CCS [ɫ] and intervocalic [z] supported their classification as contact-induced.

Table 46 - Synthesis of Sources for CCS [ɫ] and [z] as Endogenously Motivated or Contact-Induced

<div style="display: flex; flex-direction: column; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #90EE90; margin-bottom: 5px;"></div> + Contact </div> <div style="display: flex; flex-direction: column; align-items: center;"> <div style="width: 15px; height: 15px; background-color: #FFB6C1; margin-bottom: 5px;"></div> - Contact </div>	Parallel Feature in Catalan ?	Presence of Feature in Other Contact Varieties?	Mediated by Bilingualism ?	Absence of Feature in Monolingual Spanish?	Endogenous Motivations?
Dark [ɫ]	Dark [ɫ] & Cognate Effect	Sp.-English Dark [ɫ]	Darker /l/ with greater exposure / use of Catalan	light [l]	Cross-linguistic Tendency for syllable-final velarization & coarticulation
Inter-vocalic Voiced [z]	Inter-vocalic Voiced [z] & adherence to Catalan phonotactics	Sp.-English Sp.-Quechua Intervocalic Voiced [z]	More voicing with greater exposure / use of Catalan	Intervocalic Voiced [z]	Cross-linguistic tendency for lenition word-finally, bolstered across unstressed syllables

With respect to lateral velarization and intervocalic fricative voicing, both phenomena have clear endogenous motivations, as indicated by the right-most column in table 46. For [ɫ], syllable-final velarization is claimed to be a common tendency in Romance and Germanic languages (cf. Allen 1989: 33; Grandgent 1991: 185-187; Niedermann 1953: 9; Rasico 1981: 200; Recasens 2014a: 21; Slomanson & Newman 2004: 209), and was found to condition lateral velarization in both CCS as well as monolingual Madrid Spanish. Similarly, coarticulation effects (favoring velarization in the context of an adjacent non-front vowel and/or velar consonant) were found for both CCS and Madrid Spanish, which are plainly accountable within a framework of gestural phonology (cf. Browman & Goldstein 1989; 1991; 1995). For [z], our findings of enhanced voicing over unstressed syllables can be accounted for in gestural phonology (cf. Browman & Goldstein 1989; 1991) as an instantiation of hyper-articulation in stressed syllables, which have longer durations in

Spanish (Hualde 2005: 244; 2014: 251). This account treats intervocalic /s/-voicing as a phenomenon of lenition, which has additionally been proposed to account for increased voicing (as lenition) word-finally in Madrid Spanish (cf. Hualde & Prieto 2014: 119, 123; Torreira & Ernestus 2012: 137), and can account for the parallel finding for our present CCS data.

Notwithstanding these language-internal accounts for the lateral velarization and intervocalic /s/-voicing observed in our CCS data, a series of additional pieces of evidence suggest that contact with Catalan very well may play a role in the innovation of these phenomena in CCS. First and foremost, both phenomena exist as standard features in Catalan (for [ɫ], cf. Badia i Margarit 1984: 103-104; Casanovas Català 1995: 56; Hualde 1992: 373, 396; Payrató 1985: 108; Prieto 2004: 204; Recasens 1986: 102; 1991: 307; 1993: 178-179; 2004: 594; 2012: 371; 2014a: 20; 2014b: 175-214; Recasens & Espinosa 2005: 3; Recasens & Pallarès 2001: 37, 47-48; Recasens et al. 1995: 38; Wheeler 2005: 34; for intervocalic [z], cf. Bonet & Lloret 1998: 118-119; Hualde 1992: 371-372, 393-394; Hualde & Prieto 2014: 109; Julià i Muné 2008: 66-67; Pieras 1999: 212; Prieto 2004: 208, 216; Recasens 2014b: 239-240; Wheeler 2005: 147-149, 162), making them available as impositions in a situation of SL agentivity (cf. Van Coetsem 2000). Both were additionally attested in the Catalan elicited in the present dissertation research. Additionally, lateral velarization in our CCS data was found to be stronger in greater Catalan cognates, evidencing the role of Catalan in an interconnected bilingual lexicon (cf. Brown & Harper 2009; Bybee 2002; 2006; Costa, Santesteban, & Caño 2005; Johnson 1997; Pierrehumbert 2001; 2003), and ‘Catalan-like’ nearly fully voiced CCS /s/ productions were categorically avoided by Catalan-dominant bilinguals word-initially, suggesting an adherence to Catalan phonotactics.

Second, [ɫ] and intervocalic [z] are both attested in other Spanish contact situations in which Spanish, as the RL, is in contact with another language (SL) that features [ɫ] and/or

intervocalic [z]. For [ʎ], Spanish in contact with English has attested this feature (cf. Díaz-Campos 2004; 2006; Bean 2013; Solon 2015), and for [z], in addition to Spanish in contact with English (cf. Menke & Face 2012; Schmidt 2008), various Spanish varieties in contact with Quechua have also attested this feature (cf. Bradley 2005; Bradley & Delforge 2006; Canfield 1962: 81, as cited in Obaid 1973: 63; Chappell 2011; Colina 2009; Córdoba 1996: 191-192; Dalbor 1997: 227; Hualde 2014: 155; Lipski 1989; 1994: 248; Montes Giraldo 1984; Torreblanca 1986: 68; Flórez 1963: 268; García 2013; Navarro Tomás 1962: 81; Robinson 1979; Strycharczuk et al. 2014; Toscano Mateus 1953: 79). Accordingly, these cases of transfer in other contact varieties of Spanish suggest that a parallel contact influence in the Catalan-Spanish situation would certainly be possible from a purely phonetic standpoint.⁹⁹

Third, both of these phenomena were found to be mediated by the degree of exposure and usage of Catalan in our CCS data. That is, greater degrees of velarization (as well as greater frequencies of ‘Catalan-like’ laterals) and greater degrees of intervocalic /s/-voicing (as well as greater frequencies of ‘Catalan-like’ fricatives) were found in Catalan-dominant bilinguals’ speech, while lesser degrees (and lesser corresponding frequencies) were found in Spanish-dominant and monolingual Spanish speakers’ speech. As discussed in the previous subsection, this influence is consistent with the analysis of Catalan-dominant bilinguals as the innovators of both of these phenomena in the bilingual CCS community.

Lastly, with respect to the presence of [ʎ] and intervocalic [z] in monolingual varieties of Spanish, while we are unaware of any attestations of [ʎ] in a monolingual Spanish variety (cf. Casanovas Català 1995: 56; Dalbor 1997: 251; Hualde 2014: 178; Hualde et al. 2010: 79; Morgan 2010: 331; Navarro Tomás 1918: 88; Payrató 1985: 108; Proctor 2009: 50; Quilis et

⁹⁹ However, it should be again noted that whereas the transfer of Catalan [ʎ] into Spanish involves the introduction of a non-native (or foreign) sound into Spanish, the transfer of Catalan [z] into Spanish is linked to a new distribution of allophones of /s/, namely [s] and [z], which are both native to Spanish.

al. 1979; Recasens & Espinosa 2005: 3; Schwegler et al. 2010: 297-299; Teschner 1996: 155), attestations of sporadic usages of intervocalic [z] in monolingual Spanish varieties are surprisingly abundant (cf. Dalbor 1997: 228; Espinosa 1935; Obaid 1973: 63; Torreblanca 1978: 501 and references within). Experimental studies on Madrid Spanish and Mexico City Spanish have also attested [z] (cf. Hualde & Prieto 2014; Torreira & Ernestus 2012; Schmidt & Willis 2011). Thus, whereas our findings of rather frequent usages of ‘Catalan-like’ extremely velarized laterals in CCS is unique in the sense that no monolingual Spanish varieties have been claimed to feature dark [ɫ], the same cannot be said for intervocalic [z]: “...the voicing of intervocalic fricatives (e.g. /aza/ > /asa/)... [is a] natural, unremarkable phenomenon[on]” (Hualde & Prieto 2014: 111).

If we were to follow traditional frameworks of historical and comparative linguistics (cf. Bynon 1977; Lass 1980; 1990; 1997), the more parsimonious account of both of these CCS phenomena (and particularly intervocalic [z], since it’s present in monolingual Spanish varieties) would be to attribute each solely to the endogenous mechanisms described above (and which appear as the right-most column of table 46). Following Weinreich et al’s. (1968) Speaker-based Theory of Language Change, however, rather than dismiss the abundance of evidence in favor of contact-induced innovation for each feature, we propose that endogenous forces in addition to language contact (with Catalan) conjointly account for the emergence of both features in CCS (cf. Dorian 1993; Filppula 2003; Hickey 2012; Milroy 1993; 2003; Milroy & Milroy 1997; Montoya et al. 1995; Paredes & Sánchez-Prieto Borja 2008; Romaine 1995; Thomason 2010; Turell Julià 1995; 2000), as well as for the variation in their usage as evidenced in our CCS dataset. To bolster this analysis, we shall offer an additional examination of patterns of intervocalic /s/-voicing in CCS and monolingual Spanish varieties, since the attestation of non-sporadic intervocalic [z] production in monolingual varieties (cf. Hualde & Prieto 2014; Torreira & Ernestus 2012; Schmidt &

Willis 2011) offers perhaps the biggest counter argument against the role of language contact in the innovation of CCS voiced [z].

In order to make the most valid comparisons between the intervocalic /s/-voicing observed in our present CCS data and that in monolingual Spanish varieties, we shall draw upon the experimental findings reported for monolingual Madrid Spanish by Hualde & Prieto (2014) and Mexico City Spanish by Schmidt & Willis (2011), as these experiments analyzed conversational (casual, semi-spontaneous) speech comparable to that which we elicited in the present dissertation research using Labovian sociolinguistic interviews. We have organized the frequencies of voiced [z] tokens (defined as those with complete, interrupted voicing in Hualde & Prieto [2014: 114-115], or those voiced segment durations of at least 60% in Schmidt & Willis [2011: 6]) from these two studies in table 47, below. Additionally, we have added the frequencies of fully voiced (i.e., voiced segment duration of 100%) /s/ tokens elicited from all Catalan-dominant bilinguals (e.g. groups A and B) in the sociolinguistic interviews.

Table 47: Frequencies of Intervocalic Voiced [z] Production in 3 Spanish Varieties (Casual Speech)

Spanish Variety	Syllable-Initial	Syllable-Final
Madrid Spanish (Hualde & Prieto 2014)	7.23%	12.5 %
Mexico City Spanish (Schmidt & Willis 2011)	9.35%†	
Barcelonan Spanish (Present Study, Groups A & B)	0%	68.35%

† A precise breakdown of syllable-initial vs. syllable-final intervocalic /s/ tokens is not offered.

While Madrid Spanish, Mexico City Spanish, and Barcelonan Spanish all (arguably) show non-sporadic frequencies of intervocalic [z] production, which could be construed as evidence in favor of the analysis of this feature as an endogenous, non-contact-induced feature, we call attention to two crucial patterns that highlight the unique case of intervocalic /s/-voicing in bilingual CCS. First, with respect to the sheer presence of [z] production in

each variety, the overall rate of Barcelonan [z] production in syllable-final contexts alone is more than three times the combined frequencies of [z] production across both syllable contexts in Madrid Spanish. The overwhelming presence of fully voiced [z] (syllable-finally) in Barcelonan CCS as a clear majority variant in comparison with its frequency in Madrid Spanish suggests that the linguistic mechanisms operating in Madrid Spanish to facilitate [z] production are distinct from those operating in Barcelonan CCS. The influence of Catalan, a language in which the corresponding frequency of a completely voiced [z] in the parallel syllable context is over 94% (calculated from the elicited data in our present study), can be proposed as a clear factor in the sizeable distinctions between [z] frequency across monolingual Spanish and CCS. Thus, whereas monolingual Spanish shows signs of structural forces internal to Spanish, CCS (additionally) shows signs of structural forces internal to Catalan.

Second, with respect to the attested syllable position effect, both CCS and Madrid Spanish show greater frequencies of [z] syllable-finally over syllable-initially. This trend, linked to language-internal propensities favoring greater lenition in this context (cf. Nam et al. 2009, as cited in Hualde & Prieto 2014: 123), could be construed as evidence in favor of the classification of CCS [z] as non-contact-induced. However, once again, the magnitude of the effect across the two varieties is quite distinct. In Barcelonan CCS, the difference in [z] production rates across the syllable positions is nearly 13 times that same difference in Madrid Spanish. Moreover, in Barcelonan Spanish this effect is outright categorical in that not a single production of [z] is attested syllable-initially. Thus, the magnitude of this effect in Barcelonan CCS, in addition to its categorical nature, are rather difficult to account for by only appealing to linguistic universals regarding stronger lenition rates in syllable-final positions over syllable-initial positions. Nevertheless, when one considers that Catalan exhibits a phonemic voicing contrast syllable-initially that is neutralized syllable-finally to

produce [z] in the context of a following vowel, the distribution and magnitude of [z] productions in Barcelonan CCS can be claimed to almost perfectly parallel the phonotactics of Catalan.

In summary, our exhaustive analysis of linguistic factors involved in Barcelonan CCS lateral velarization and intervocalic /s/-voicing has brought about the consideration of several language-internal constraints operating for both phenomena, unique in terms of whether or not they are internal to Spanish vs. Catalan. It is only when considering how these structural factors are linked to distinct languages that we arrive at a much more comprehensive (and more accurate) account of the presently observed patterns of [ɬ] and [z] production in Barcelonan CCS (particularly in comparison with these patterns in monolingual varieties of Spanish).

6.3. Conclusions and Areas for Further Research

The present investigation has sought to explore language variation and change in a bilingual setting, incorporating frameworks and methodologies from Labovian variationist sociolinguistics, contact linguistics, and sociophonetics. By investigating the linguistic and social factors that mediate language variation in Barcelonan CCS with respect to lateral velarization and intervocalic fricative voicing, we have been able to how these forces operate in tandem, and additionally we have been able to attribute differences in usage patterns according to the distinct social values that [ɬ] and [z] hold within (and outside of) the CCS community. Moreover, we have explored how the innovation and subsequent propagation patterns of phonetically gradient phenomena can be assessed with respect to both discrete sounds as well as ranges of sounds along a scalar continuum. Furthermore, we have shown how both quantitative and qualitative assessments of contact influence can be used to empirically evaluate the role of language contact in the innovation of specific linguistic

features in a contact setting.

In light of the findings of the present investigation, several avenues for future research present themselves. First, since only two features of Barcelonan CCS were examined in this dissertation, future investigations of this contact variety of Spanish would benefit from investigating usage patterns and attitudes of other potential contact features in order to develop a wider and more complete sociolinguistic profile of Barcelonan CCS. If more phonetic features were analyzed, for example, it would be possible to create full phonetic profiles for different kinds of bilingual speakers, facilitating an examination of how phonetic features in Barcelonan CCS may cluster with one another and be used in conjunction with one another to position one's self within the CCS community (cf. Vann 2007). Such an investigation could even additionally incorporate morphosyntactic variables, permitting an empirical examination of similarities and differences between language variation and change across grammatical domains.

Another interesting avenue of research concerns taking a closer look at how variation and change in Spanish and Catalan influence one another. In the present dissertation, since the focus was variation and change in CCS, Catalan was incorporated in order to establish comparison levels of reference for lateral velarization and intervocalic fricative voicing. Particularly in light of the low degree of typological distance between the languages, however, changes in lateral velarization degrees in Spanish, for example, might have implications for lateral production in Catalan, or vice-versa. That is, if the negative stigma associated with CCS [ɬ] plays a role in the eventual decrease in lateral velarization degrees in CCS, might this shift in CCS lateral production affect lateral production in Catalan? The present study is not able to answer, for example, whether or not the stigma associated with CCS [ɬ] is intrinsic to the sound itself and thus is overtly stigmatized in both Spanish and Catalan, or if it is instead specific to Spanish. The answer to this question would have

implications for language variation and change in Catalan. Accordingly, in a broader sense, in order to better understand the dynamics of contact-innovations in bilingual settings, language variation and change should be explored with respect to both languages, as it is precisely in these settings that both languages are able to mutually influence one another (as lead, of course, by the population[s] of bilingual speakers).

Lastly, it is important to note that the present dissertation research explored just two groups of CCS speakers in Barcelona, namely Catalan-dominant speakers and Spanish-dominant speakers. Recall from table 3 (in section 1.3.2), however, that Barcelona is home to the largest population of both Spanish and foreign immigrants in all of Catalonia. With respect to the foreign immigrants in particular, recall that the predominant group is Ecuadorian, and thus speak a contact variety of Spanish that, parallel to CCS, is claimed to feature intervocalic /s/-voicing (cf. Chappell 2011: 60-61; Lipski 1989: 50; 1994: 248; Robinson 1979: 137-138; Strycharczuk et al. 2014: 3; Toscano Mateus 1953: 79). Accordingly, one facet of the dynamics of language variation and change that was not explored in this dissertation research is that of dialect contact. That is, if the largest group of immigrant speakers in Barcelona already are intervocalic ‘/s/-voicers,’ how might this contribute to the attested difference in diffusion degrees between [z] and [ʃ]? Do native CCS bilinguals still attribute the same positive associations of solidarity with intervocalic /s/-voicing in the speech of immigrants that they do with this feature in CCS speech? Moreover, do the same linguistic and social constraints that mediate intervocalic /s/-voicing in the speech of native CCS bilinguals operate in Ecuadorian Spanish (distinguishing between that spoken in Ecuador by the native population and that spoken by Ecuadorian immigrants in Barcelona)? The answers to these questions would facilitate a better understanding of the data trends found for the present CCS data, and additionally allow for comparisons to be drawn across two very different bilingual communities for the same linguistic feature.

Moreover, since the analysis of Ecuadorian intervocalic /s/-voicing has yet to be empirically linked to contact with Quechua, the experimental methodology used in this dissertation research can be applied to different contact situations in order to permit broader comparisons between the factors that help account for the innovation (and possible subsequent diffusion) of select linguistic features in bilingual communities.

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APPENDIX A - SOCIO-DEMOGRAPHIC QUESTIONNAIRE

Sección 1: Completa el siguiente cuestionario escribiendo tus respuestas o haz un círculo en la(s) respuesta(s) correcta(s).

‘Complete the following questionnaire by either writing your answers or placing a circle around the correct answer(s).’

1) Género: MASCULINO FEMENINO

Gender: Masculine Feminine

2) Edad: _____

Age:

3) Localidad en la que naciste **tú**: _____

Neighborhood where you were born:

Localidad en la que nació **tu madre**: _____

Neighborhood where your mother was born:

Localidad en la que nació **tu padre**: _____

Neighborhood where your father was born:

4) Localidad en la que creciste **tú**: _____

Neighborhood where you grew up:

Localidad en la que creció **tu madre**: _____

Neighborhood where your mother grew up:

Localidad en la que nació **tu padre**: _____

Neighborhood where your father grew up:

5) ¿Qué ocupación tienes? Elige la opción más adecuada (si no trabajas, indica el último trabajo en el que trabajaste):

What is your line of work? Choose the best option (if you don't work, indicate the last job that you held):

a. sin trabajo remunerado (en paro, ama de casa, estudiante, etc.)

b. empleado/a de un negocio, administrativo de una empresa, etc.

c. mando intermedio o directivo de una empresa

d. empresario

e. profesional liberal (abogado/a, arquitecto/a, médico/a, etc.)

f. funcionario del Estado, Comunidad Autónoma o Ayuntamiento

g. Ninguna de las anteriores -> _____

¿Desde cuándo? _____

Since when?

6) Usando las mismas opciones de arriba (a,b,c,d,e,f,g), ¿cuál es la ocupación de...? (si están jubilados, indica su trabajo anterior)

Using the same options as above (a-g), which is the link of work of...

tu madre: _____

your mother:

tu padre: _____

your father:

7) Nivel de estudios más alto de los padres (haz un círculo en el nivel más alto completado):
Parents' highest education level (circle the highest completed level)

Madre:	Primaria	Padre:	Primaria
	Secundaria		Secundaria
	Módulo medio / superior		Módulo medio / superior
	Formación Profesional (F.P.)		Formación Profesional (F.P.)
	Bachillerato o B.U.P.		Bachillerato o B.U.P.
	Universitaria		Universitaria
	Máster		Máster
	Doctorado		Doctorado

8) Tu nivel de estudios (haz un círculo en el nivel más alto completado):
Your highest level of completed education (circle the highest completed level)

Primaria
Secundaria (E.S.O.)
Módulo medio / superior
Formación Profesional (F.P.)
Bachillerato o B.U.P.
Universitaria
Máster
Doctorado

9) El idioma que hablaste **principalmente** en casa cuando crecías es (sólo uno, el que se usó principalmente):

The language you principally grew up speaking at home is (only 1, the one used principally):

Castellano Catalán Otro: _____

10) Indica el idioma/los idiomas en el/los que tu **madre** te hablaba en casa cuando crecías (puedes indicar más de uno):

Indicate the language(s) in which your mother spoke to you at home while you grew up (you can indicate more than one)

Castellano Catalán Otro(s): _____

11) Indica el idioma/los idiomas en el/los que tu **padre** te hablaba en casa cuando crecías (puedes indicar más de uno):

Indicate the language(s) in which your father spoke to you at home while you grew up (you can indicate more than one)

Castellano

Catalán

Otro(s):

12) *¿A qué edad empezaste a aprender:*

At what age did you begin to learn:

el catalán

0-3

4-7

8-12

+12

el castellano

0-3

4-7

8-12

+12

13) *Si creciste en Barcelona capital, indica el barrio en el que creciste (ejemplos: Gràcia, Clot, Sagrera, Sant Andreu, Eixample, etc.)*

If you grew up in Barcelona (the capital), indicate the neighborhood in which you grew up (examples: Gràcia...)

14) *¿En qué idioma(s) fue **principalmente** tu enseñanza primaria?*

In which language(s) was your elementary school education principally conducted?

Castellano

Catalán

Otro(s):

15) *¿En qué idioma(s) hablabas **principalmente** con tus compañeros en primaria?*

In which language(s) did you principally speak with your elementary school friends?

Castellano

Catalán

Otro(s):

16) *En qué idioma(s) fue **principalmente** tu enseñanza secundaria?*

In which language(s) was your high school education principally conducted?

Castellano

Catalán

Otro(s):

17) *¿En qué idioma(s) hablabas **principalmente** con tus compañeros en el instituto?*

In which language(s) did you principally speak with your high school friends?

Castellano

Catalán

Otro(s):

18) Basándote en la escala del 1 al 5, evalúa tus habilidades lingüísticas:

Using the 1-5 scale, evaluate your linguistic abilities:

(0= nada; 1= poco; 2= necesita refuerzo; 3= bien; 4= muy bien; 5= nativo)

(0 = none; 1 = little; 2 = needs work; 3 = good; 4 = very good; 5 = native)

Castellano:	Leer=	Hablar=	Comprensión=	Escribir=
	Read	Speak	Understand	Write
Catalán:	Leer=	Hablar=	Comprensión=	Escribir=

19) ¿Consideras el catalán tu lengua materna o tu segunda lengua?

Do you consider Catalan your native language or a second language?

Nativo	Segunda lengua	No sé nada de Catalán
Native	Second language	I don't know any Catalan

20) En general, ¿qué idioma prefieres usar? (indica uno):

In general, which language do you prefer to use? (indicate one):

Castellano	Catalán	Depende de con quién hable	Los dos
Spanish	Catalan	It depends with whom I speak	Both

21) Haz una estimación del porcentaje (0-100%) que utilizas castellano y catalán en tu vida cotidiana:

Estimate the percentage (0-100%) with which you use Spanish and Catalan in your daily life:

con la familia:

with your family:

castellano Spanish	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	catalán Catalan

con amistades:

with friends:

castellano Spanish	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	catalán Catalan

en el trabajo / estudios

at your job / place of study

castellano Spanish	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	catalán Catalan

de compras:

shopping:

castellano Spanish	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	catalán Catalan

con desconocidos:

with strangers:

castellano Spanish	100%	90%	80%	70%	60%	50%	40%	30%	20%	10%	0%	
	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	100%	catalán Catalan

Sección 2: A continuación vas a leer una serie de afirmaciones sobre las lenguas que se hablan en Barcelona. Por favor, indica si estás de acuerdo con estas afirmaciones escribiendo una X junto a la opción que te parezca más apropiada. Intenta contestar con sinceridad y recuerda que no hay respuestas ni correctas ni incorrectas.

Section 2: Below you will read a series of statements about languages that are spoken in Barcelona. Please indicate if you agree with these statements by placing an X in the corresponding box that matches your opinion. Please try to answer honestly and remember, there are neither correct nor incorrect answers.

5 = Completamente de acuerdo

4 = De acuerdo

3 = Ni de acuerdo Ni en desacuerdo

2 = En desacuerdo

1 = Completamente en desacuerdo

5 = Strongly agree

4 = Agree

3 = Neither agree nor disagree

2 = Disagree

1 = Strongly disagree

Completamente
de acuerdo

Completamente
en desacuerdo

Completely agree

Completely
disagree

	5	4	3	2	1
1). El catalán puede convivir con el castellano en Cataluña. Catalan can coexist alongside Spanish in Catalonia.					
2). La gente considera que uno es de clase social más baja si habla en catalán.					

People believe that a person is of a lower social class if that person speaks in Catalan.					
3) <i>Me gusta que se enseñe en catalán a los niños en la escuela.</i> I like that Catalan is taught to children in school.					
4) <i>Me gustaría que el castellano sustituya al catalán en Barcelona.</i> I would like it if Spanish replaced Catalan in Barcelona.					
5) <i>Estaría muy bien si toda la gente de Barcelona hablara catalán y castellano.</i> It would be great if everyone in Barcelona spoke both Catalan and Spanish.					
6) <i>Es una pérdida de tiempo estudiar catalán hoy en día en Barcelona.</i> It's a waste of time to study Catalan nowadays in Barcelona.					
7) <i>Si viajo a otro país y me preguntan acerca de mi nacionalidad, les digo que soy catalán en vez de español.</i> If I travel to another country and I am asked about my nationality, I tell them first that I am Catalan and second that I am Spanish.					
8) <i>Que la gente me hable en catalán y no en castellano me molesta.</i> It bothers me that people speak to me in Catalan and not in Spanish.					
9) <i>Estoy orgulloso/a de poder hablar catalán.</i> I am proud of being able to speak Catalan.					
10) <i>La gente piensa que el catalán es una lengua que sólo se debe hablar en el campo.</i> People think that Catalan is a language that should only be spoken in the country.					

APPENDIX B - CAREFUL SPANISH ELICITED PRODUCTION TASK

/I/ Items - Items Underlined signify those incorporated from Simonet (2010: 667; 2008: 264)

1 - Syllable Position Type: Syllable-Initial (1); Syllable-Final (2)

2 - Surrounding Segment(s) Place of Articulation: Non-Front/Velar (1); Non-Velar/Front (2)

3 - Word Class Type: Open Class Category (1); Closed Class Category (2)

4 - Catalan Cognate Status: Greater Cognate (1); Lesser Cognate (2)

Test Item	Coding (per Level as Linguistic Factor 1/2/3/4)
<i>lámina gruesa</i> ‘thick sheet’	1/1/1/1
<i>la taza</i> ‘the cup’	1/1/2/1
<u><i>litros de leche</i></u> ‘liters of milk’	1/2/1/1, also used to track vowel formants for s-normalization
<i>le gusta mucho</i> ‘s/he likes it a lot’	1/2/2/1
<i>general gordo</i> ‘fat general’	2/1/1/1
<i>al garaje</i> ‘to the garage’	2/1/2/1
<i>hotel barato</i> ‘cheap hotel’	2/2/1/1
<i>el baño</i> ‘the bathroom’	2/2/2/1
<i>lucha importante</i> ‘important fight’	1/1/1/2
<i>lo peor</i> ‘the worst’	1/1/2/1
<i>lentejas rojas</i> ‘red lentils’	1/2/1/2
<i>le conviene estudiar</i> ‘it is in his/her interest to study’	1/2/2/1
<i>crystal grande</i> ‘big crystal’	2/1/1/2
<i>al caballo</i> ‘to the horse’	2/1/2/1
<i>piel blanca</i> ‘white skin’	2/2/1/2
<i>el techo</i> ‘the ceiling’	2/2/2/1
<i>lógica razonable</i> ‘reasonable logic’	1/1/1/1
<i>la botella</i> ‘the bottle’	1/1/2/1
<i>lectora flaca</i> ‘skinny reader’	1/2/1/1
<i>le frustra mucho</i> ‘it frustrates him/her a lot’	1/2/2/1
<i>control grande</i> ‘big control’	2/1/1/1
<i>al gallego</i> ‘to the Galician’	2/1/2/1
<i>fósil bonito</i> ‘beautiful fossil’	2/2/1/1
<i>el dedo</i> ‘the finger’	2/2/2/1
<i>lomo seco</i> ‘dry pork loin’	1/1/1/2
<i>lo nuestro</i> ‘ours’	1/1/2/1
<i>libro grande</i> ‘big book’	1/2/1/2
<i>le queda azúcar</i> ‘s/he has sugar left’	1/2/2/1
<i>chándal gracioso</i> ‘funny track suit’	2/1/1/2
<i>al camino</i> ‘to the road’	2/1/2/1
<i>nivel bueno</i> ‘good level’	2/2/1/2
<i>el vaso</i> ‘the glass’	2/2/2/1
<u><i>lupa francesa</i></u> ‘French lens’	1/1/1/1, also used to track vowel formants for s-normalization
<i>la mesa</i> ‘the table’	1/1/2/1
<i>límite absoluto</i> ‘absolute limit’	1/2/1/1
<i>le damos dinero</i> ‘we give him/her money’	1/2/2/1
<i>animal cautivo</i> ‘captive animal’	2/1/1/1
<i>al gusto</i> ‘to the liking of’	2/1/2/1
<i>ángel tímido</i> ‘timid angel’	2/2/1/1
<i>el diente</i> ‘the tooth’	2/2/2/1
<i>lago pequeño</i> ‘small lake’	1/1/1/2
<i>lo bueno</i> ‘the good’	1/1/2/1
<i>limón agrio</i> ‘sour lemon’	1/2/1/2
<i>le pagan mucho</i> ‘they pay him/her a lot’	1/2/2/1
<i>coral grande</i> ‘big coral’	2/1/1/2
<i>al camarero</i> ‘to the waiter’	2/1/2/1
<i>coronel tacaño</i> ‘stingy coronel’	2/2/1/2

<i>el puño</i> ‘the fist’	2/2/2/1
<i>laberinto confuso</i> ‘confusing labyrinth’	1/1/1/1
<i>la pasta</i> ‘the pasta’	1/1/2/1
<i>lente transparente</i> ‘transparent lens’	1/2/1/1
<i>le molesta mucho</i> ‘it bothers him/her a lot’	1/2/2/1
<i>sol caliente</i> ‘hot sun’	2/1/1/1
<i>al gallo</i> ‘to the rooster’	2/1/2/1
<i>túnel tapado</i> ‘covered tunnel’	2/2/1/1
<i>el día</i> ‘the day’	2/2/2/1
<i>labios rojos</i> ‘red lips’	1/1/1/2
<i>lo mejor</i> ‘the best’	1/1/2/1
<i>letra pequeña</i> ‘small letter’	1/2/1/2
<i>le falta dinero</i> ‘s/he lacks money’	1/2/2/1
<i>nogal grande</i> ‘big walnut tree’	2/1/1/2
<i>al comedor</i> ‘to the dining room’	2/1/2/1
<i>cartel pequeño</i> ‘small sign’	2/2/1/2
<i>el pato</i> ‘the duck’	2/2/2/1
<i>laca muy buena</i> ‘very good hairspray’	1/1/1/1, also used to track vowel formants for s-normalization
<i>la costumbre</i> ‘the custom’	1/1/2/1
<i>liquido azul</i> ‘blue liquid’	1/2/1/1
<i>le regala dinero</i> ‘s/he gifts money’	1/2/2/1
<i>gandul gordo</i> ‘fat loafer’	2/1/1/1
<i>al gato</i> ‘to the cat’	2/1/2/1
<i>perfil bueno</i> ‘good profile’	2/2/1/1
<i>el topo</i> ‘the mole’	2/2/2/1
<i>lágrima transparente</i> ‘transparent tear’	1/1/1/2
<i>lo malo</i> ‘the bad’	1/1/2/1
<i>lengua bonita</i> ‘beautiful language’	1/2/1/2
<i>le fascina mucho</i> ‘it fascinates him/her a lot’	1/2/2/1
<i>metal grueso</i> ‘thick metal’	2/1/1/2
<i>al campo</i> ‘to the camp’	2/1/2/1
<i>papel blanco</i> ‘white paper’	2/2/1/2
<i>el banco</i> ‘the bank’	2/2/2/1
<i>pedí liquido</i> ‘I ordered liquid’	X: used only to track vowel formants for s-normalization
<i>se pondrá laca</i> ‘s/he will put hairspray on’	X: used only to track vowel formants for s-normalization
<i>habla zulú bien</i> ‘s/he speaks Zulu well’	X: used only to track vowel formants for s-normalization
<i>venden dos mil</i> ‘they sell two-thousand’	X: used only to track vowel formants for s-normalization
<i>el menor mal</i> ‘the smaller damage’	X: used only to track vowel formants for s-normalization
<i>hecho de tul</i> ‘made of tulle’	X: used only to track vowel formants for s-normalization

/s/ Items

- 1 - Word Position: Word-Initial Intervocalic (1); Word-Final Intervocalic (2)
- 2 - Surrounding Vowels' Stress: Unstressed (1); Stressed/Mixed (2)
- 3 - Word Class: Open Class Category (1); Closed Class Category (2)

Test Item	Coding (per Level as Linguistic Factor 1/2/3)
<i>las hachas</i> 'the axes'	2/2/2
<i>darás asco</i> 'you will be disgusting'	2/2/1
<i>tras amar</i> 'after loving'	2/1/2
<i>eras abogada</i> 'you were a lawyer'	2/1/1
<i>estará sin remedio</i> 's/he will not have a solution'	1/2/2
<i>habrá salmón</i> 'there will be salmon'	1/2/1
<i>primavera sin lluvia</i> 'Spring without rain'	1/1/2
<i>estaba salado</i> 'it was salty'	1/1/1
<i>tras años</i> 'after years'	2/2/2
<i>dirás algo</i> 'you will say something'	2/2/1
<i>las abuelas</i> 'the grandmothers'	2/1/2
<i>chicas aburridas</i> 'bored girls'	2/1/1
<i>leerá sobre el universo</i> 's/he will read about the universe'	1/2/2
<i>será salvaje</i> 's/he will be savage'	1/2/1
<i>escribía sobre el país</i> 's/he wrote about the country'	1/1/2
<i>quería saltar</i> 'I wanted to jump'	1/1/1
<i>las aguas</i> 'the waters'	2/2/2
<i>serás apto</i> 'you will be capable'	2/2/1
<i>tras abril</i> 'after April'	2/1/2
<i>estuvieras aquí</i> 'that you were here'	2/1/1
<i>comerá sin parar</i> 's/he will eat non-stop'	1/2/2
<i>estará sabrosa</i> 'it will be tasty'	1/2/1
<i>carta sin nombre</i> 'letter without a name'	1/1/2
<i>había salchichas</i> 'there were sausages'	1/1/1
<i>tras hábitos rotos</i> 'after broken habits'	2/2/2
<i>serás ágil</i> 'you will be agile'	2/2/1
<i>las arañas</i> 'the spiders'	2/1/2
<i>comías arroz</i> 'you ate rice'	2/1/1
<i>aprenderá sobre la política</i> 's/he will learn about politics'	1/2/2
<i>querrá saber</i> 's/he will want to know'	1/2/1
<i>cantaba sobre el amor</i> 'I sang about love'	1/1/2
<i>buena salud</i> 'good health'	1/1/1
<i>las albas</i> 'the dawns'	2/2/2
<i>hablarás árabe</i> 'you will speak Arabic'	2/2/1
<i>tras abarcar</i> 'after spanning'	2/1/2
<i>tiendas abiertas</i> 'open stores'	2/1/1
<i>dormirá sin problemas</i> 's/he will sleep without problems'	1/2/2
<i>sentirá satisfacción</i> 's/he will feel satisfaction'	1/2/1
<i>agua sin gas</i> 'non-carbonated water'	1/1/2
<i>era sagrada</i> 'it was holy'	1/1/1
<i>tras alguien</i> 'after someone'	2/2/2
<i>explorarás áreas</i> 'you will explore areas'	2/2/1
<i>las amistades</i> 'the friendships'	2/1/2
<i>drogas adictivas</i> 'addictive drugs'	2/1/1
<i>hablará sobre el futuro</i> 's/he will speak about the future'	1/2/2
<i>tendrá sabor</i> 'it will have flavor'	1/2/1
<i>historia sobre la guerra</i> 'story about war'	1/1/2
<i>había salmón</i> 'there was salmon'	1/1/1

<i>las águilas</i> ‘the eagles’	2/2/2
<i>romperás almas</i> ‘you will break souls’	2/2/1
<i>las abejas</i> ‘the bees’	2/1/2
<i>bebías alcohol</i> ‘you drank alcohol’	2/1/1
<i>está sin dinero</i> ‘s/he is without money’	1/2/2
<i>estará salado</i> ‘it will be salty’	1/2/1
<i>problema sin remedio</i> ‘problem without a solution’	1/1/2
<i>quería saber</i> ‘s/he wanted to know’	1/1/1
<i>tras ambos coches</i> ‘after both cars’	2/2/2
<i>verás arte</i> ‘you will see art’	2/2/1
<i>tras hablar</i> ‘after speaking’	2/1/2
<i>amigas animadas</i> ‘animated friends’	2/1/1
<i>cantará sobre el amor</i> ‘s/he will sing about love’	1/2/2
<i>querrá saltar</i> ‘she will want to jump’	1/2/1
<i>leyenda sobre el universo</i> ‘legend about the universe’	1/1/2
<i>era salvaje</i> ‘s/he was savage’	1/1/1
<i>las algas</i> ‘the seaweeds’	2/2/2
<i>mamás altas</i> ‘tall mothers’	2/2/1
<i>las amigas</i> ‘the friends’	2/1/2
<i>puertas abiertas</i> ‘open doors’	2/1/1
<i>vivirá sin sentido</i> ‘s/he will live without meaning’	1/2/2
<i>será sagrada</i> ‘it will be holy’	1/2/1
<i>comía sin parar</i> ‘I ate non-stop’	1/1/2
<i>estaba sabrosa</i> ‘it was tasty’	1/1/1
<i>tras algo</i> ‘after something’	2/2/2
<i>tendrás ánimo</i> ‘you will feel up (for it)’	2/2/1
<i>tras alguno</i> ‘after one’	2/1/2
<i>fueras animado</i> ‘that you were animated’	2/1/1
<i>escribirá sobre el país</i> ‘s/he will write about the country’	1/2/2
<i>habrá salchichas</i> ‘there will be sausages’	1/2/1
<i>habla sobre el futuro</i> ‘s/he speaks about the future’	1/1/2
<i>sentía satisfacción</i> ‘I felt satisfaction’	1/1/1

APPENDIX C - CATALAN ELICITED PRODUCTION TASK

Test Items - Items Underlined signify those incorporated from Simonet (2010: 667; 2008: 264)

/l/

litres de llet 'liters of milk'
laca molt bona 'very good hair spray'
lupa francesa 'French lens'
ingerí líquid 's/he swallowed liquid'
es posà laca 's/he put hair spray on'
parla zulu bé 's/he speaks Zulu well'
en venen mil 'They sell a thousand'
no li fa mal 'It does not hurt him/her'
s'ha fet de tul 'it was made of tulle'

/z/ & /s/

la casa petita 'the small house'
prefereixo una rosa 'I prefer a rose'
caminaràs aquí 'you will walk here'
una cosa gegant 'a giant thing'
des de zero 'from zero'
sortir de la zona 'to leave the zone'
és àmplia i maca 'it's wide and pretty'
una zebra petita 'a small zebra'
llibres interessants 'interesting books'

APPENDIX D - SOCIOLINGUISTIC INTERVIEW MODULES

GENERAL

Where are you from?

Where did you grow up?

HOME

Is your house or apartment a typical Barcelonan/Madridian house or apartment? What makes it typical or atypical?

Describe your home – How many rooms are there? What is your room like? In what spaces in the house does your family usually spend a lot of time?

FAMILY

Describe your family – How many people are there? Were your parents both born in Spain? Do you think your family is more or less closely knit than the typical Barcelonan/Madridian family? Why or why not? Do your relatives live close by? Is that typical for Spaniards? What kind of relationship do you have with your grandparents? Do you see them often?

HOBBIES

Where do you typically go with your friends to hang out?

What do people your age typically do in their free time in Barcelona?

Do you listen to music often? What is your favorite kind of music and why?

What's it like being a student in Spain? How are your classes? Do you have a lot of work?

What languages do you speak? Do you study any languages in school? In what language(s) do you speak with your friends most?

Describe your daily routine during the summer - what activities do you most enjoy doing?

Do you have a favorite holiday or vacation time? What do you do to relax and/or celebrate?

FOOD

What kinds of food are typical foods that people in Barcelona/Madrid eat? What about people from Spain in general?

What kinds of foods do you typically eat at home? What are your favorite foods to eat at home and why?

What kinds of drinks are typical in Barcelona/Madrid?

What time do you usually eat your meals? Are these times typical for residents of Barcelona/Madrid?

APPENDIX E - TEMPLATE /I/ AND /s/ and FILLER PASSAGES FOR THE MATCHED GUISE

/I/ - Ayer, no tenía ganas de despertarme para nada. Sonó mi despertador y vi que el sol todavía no había aparecido. Después de ir al baño, me preparé un café y también algo de comer. Sonó mi móvil mientras caminaba al comedor - era un amigo mío. Me dijo que el jueves quería ir con alguien a ver un concierto donde iba a tocar nuestra amiga. Pensaba que estaría muy triste si no fuéramos. Al final, decidí ir, entonces fuimos juntos.

‘Yesterday, I didn’t feel like waking up at all. My alarm clock went off and I saw that the sun still had not appeared. After going to the bathroom, I made myself a coffee and also something to eat. My cell phone rang while I was walking to the dining room - it was a friend of mine. He told me that on Thursday he wanted to go with somebody to see a concert where our friend was going to play. He thought she would be really sad if we didn’t go. In the end, I decided to go, so we went together.’

/s/ - Hoy es un día bonito. Después de un invierno muy frío, ya estamos en primavera. Si vas afuera, notarás en seguida que nadie tiene puesto un abrigo. Dentro de poco, voy con unos amigos a tomar un café, que ya hace mucho que no nos hemos visto todos juntos. Aunque típicamente vamos a un sitio aquí cerca, esta vez queremos encontrar otro por ahí. Como he dicho, hoy tenemos un día perfecto para ir a andar un poco.

‘Today is a beautiful day. After a very cold winter, we are finally in spring. If you go outside, you’ll immediately notice that nobody is wearing a coat. In a little bit, I am going with some friends for a coffee; it’s been a while since we’ve last seen each other all together. Although we typically go to a place here nearby, this time we want to find some other around there. As I said, today we have a perfect day for going to walk a bit.’

Filler A - *Un día, estaba caminando por el parque cuando empezó a llover. No había traído mi paraguas, entonces no tenía más remedio que ponerme al lado de un árbol grande, bajo las ramas y las hojas. Por suerte, dejó de llover después de unos diez minutos y no estaba tan empapado/a. Volví a pasear, y al de poco salió el sol y hacía buen tiempo. Decidí regresar a casa a pie, aprovechando el tiempo tan agradable.*

‘One day, I was walking through the park when it started to rain. I hadn’t brought my umbrella, so I didn’t have any other option other than to put myself next to a big tree, under the branches and leaves. Luckily, it stopped raining after about 10 minutes and I wasn’t so soaked. I returned to my walk, and soon the sun came out and the weather was nice. I decided to go home by foot, to enjoy the really nice weather.’

Filler B - *A veces cuando quiero relajarme, me gusta ir a la playa. Me encanta caminar por la arena y descansar bajo el sol. Si hace mucho calor, me meto en el agua por un rato. Muchas veces voy a una playa específica con un grupo de amigos, donde pasamos unas horas relajándonos, pero a veces cuando quiero un poco más de paz, voy a otra playa donde no suele haber mucha gente. Siempre me quita todo el estrés.*

‘Sometimes when I want to relax, I like to go to the beach. I love walking along the sand and relaxing under the sun. If it’s really hot, I hop in the water for a bit. I often go to a specific beach with a group of friends, where we spend hours relaxing, but sometimes when I want a little more peace, I go to another beach where there usually aren’t ever many people. It always gets rid of all my stress.’

Filler C - *Recuerdo que el otro día necesitaba comprar unas manzanas rojas en el supermercado. Como siempre tienen manzanas, no había pensado ir a comprarlas hasta la tarde. Así, a las cuatro salí de casa y fui al supermercado. Fui directamente a la sección de fruta y, vaya sorpresa, ¡no tenían ninguna! Busqué durante unos cinco minutos antes de admitir que realmente se les habían acabado. Decidí ir a otro supermercado un poco más lejos, y no llegué a casa hasta las seis.*

‘I remember that the other day I needed to buy some red apples at the supermarket. Since they always have apples, I didn’t think to go buy them until the afternoon. So, at 4 I left my house and went to the supermarket. I went directly to the fruit section and, go figure, they didn’t any! I looked for some 5 minutes before admitting that they really had run out of them. I decided to go to another supermarket a little farther away, and I didn’t arrive back at home until 6.’

Filler D - *El otro día, tuve una muy mala experiencia en un restaurante. Primero, cuando llegué, el sitio estaba tan lleno de gente que no había espacio para esperar adentro, entonces esperé afuera donde hacía bastante calor. Luego, cuando pedí mi plato favorito, me dijo el camarero que se les habían acabado los ingredientes, entonces tuve que pedir otro. Después, debido a algún problema con la estufa en la cocina, tardaron media hora para traer la comida. Qué mala suerte, ¿no?*

‘The other day, I had a really bad experience at a restaurant. First, when I arrived, the place was so full of people that there wasn’t room to wait inside, so I waited outside where it was pretty hot. Later, when I ordered my favorite dish, the waiter told me that they had run out of the ingredients, so I had to order another one. After, because of some problem with the stove in the kitchen, they took 30 minutes to bring the food. What bad luck?’

APPENDIX F - MATCHED GUISE QUESTIONNAIRE

Instrucciones: A continuación vas a escuchar a una serie de personas diferentes que no conoces hablando en castellano. Verás una lista de características que tendrás que atribuir a una y cada persona que escuches. Basándote en la escala del 1 al 7, indica tu opinión acerca de la persona que escuches.

Instructions: You are about to listen series of individuals, who you have never met before, speak in Spanish. Below is a list of several characteristics that you will attribute to the speaker you hear. Using the 1-7 scale, indicate your opinion about the person you hear.'

Por ejemplo, si después de escuchar a la persona piensas que es simpática, indica con un círculo el número "7" que marca "simpática." Si por el contrario piensas que la persona es antipática, indica un "1" que marca "antipática." Utiliza el número "4" si no tienes ninguna opinión si esta persona es simpática o antipática.

'For example, if after listening to the person you think that s/he is nice, circle the number 7 that indicates 'nice.' If on the other hand you think that the person is mean, circle the number 1 that indicates 'mean.' Use the number 4 if you don't have an opinion about if the person is nice or mean.'

Pienso que esta persona (es)....

'I think that this person (is)....'

1) SOLIDARITY
antipática

'mean'
country'

1 2 3 4 5

simpática

'nice'

6 7

7) RURALITY
de la ciudad

'from the city'

1 2 3 4 5

del campo

'from the

6 7

2) POWER
tiene estudios
'educated'

Spanish'

1 2 3 4 5 6 7

no tiene estudios
'uneducated'

8) BILINGUALISM
también habla catalán

'also speaks Catalan'

1 2 3 4 5 6 7

sólo habla castellano

'only speaks

3) ACCENT
sabe hablar castellano bien
'speaks Spanish well'

1 2 3 4 5

no sabe hablar castellano bien
'does not speak Spanish well'

6 7

9) SOLIDARITY
desagradable de escuchar

'unpleasant to listen to'

1 2 3 4 5 6 7

agradable de escuchar

'pleasant to listen to'

4) [filler]
sólo habla castellano
'only speaks Spanish'

1 2 3 4 5

también habla vasco

'also speaks Basque'

6 7

10) POWER
fiable
'trustworthy'

1 2 3 4 5 6 7

dudosa
'untrustworthy'

5) SOLIDARITY
no sería mi amigo/a fácilmente
'would not easily be my friend'

1 2 3 4 5

sería mi amigo/a fácilmente
'would easily be my friend'

6 7

11) ACCENT
tiene un acento bonito
'has a pretty accent'

1 2 3 4 5 6 7

tiene un acento feo
'has an ugly accent'

6) POWER

12) [filler]

*tiene un trabajo
que le pagan bien*
'has a high-paying job'
1 2 3 4 5

*tiene un trabajo
que le pagan mal*
'has a low-paying job'
6 7

*sólo habla
castellano*
'only speaks Spanish'
1 2 3 4

*también habla
gallego*
'also speaks Galician'
5 6 7

¿Qué edad piensas que tiene esta persona?

'What age do you think this person is?'

adolescente (12-18)
'teenager'

universitaria (18-25)
'college-age'

entre 25-30
'between 25-30'

en los 30
'in his/her 30's'

más de 40
'over 40'

¿Cómo habla esta persona?

'How does this person speak?'

*más bien como los jóvenes
mayores*
'somewhat like younger people'
people'

no sé
'I don't know'

*más bien como los
mayores*
'somewhat like older
people'

¿Cómo te parece esta persona?

'How does this person seem to you?'

Esta persona parece ser...

'This person seems...'

1)
 trabajadora
'hard-working'

no sé
'I don't know'

perezosa
'lazy'

2)
 pobre
'poor'

no sé
'I don't know'

rica
'rich'

3)
 culta
'cultured'

no sé
'I don't know'

campesina
'peasant-like'

De estas ocupaciones, ¿cuál(es) tendría esta persona? (Indica todas las posibles respuestas)

'Of these occupations, which would this person have? (Indicate all possible answers)'

trabaja en el campo
'farmer/ farm laborer'

cajero/a
'a cashier'

taxista
'a taxi-driver'

maestro/a
'a teacher'

comerciante
'a shopkeeper'

gerente
'a manager'

banquero/a
'a banker'

político/a
'a politician'

abogado/a
'a lawyer'

¿Qué **otra** lengua habla esta persona?
'What other language does this person speak?'

ninguna
'none'

vasco
'Basque'

catalán
'Catalan'

gallego
'Galician'

francés
'French'

portugués
'Portuguese'

¿Dónde crees que aprendió el castellano esta persona? (*país, región, etc.*)

'Where do you think this person learned Spanish? (country, region, etc.)'

¿Qué tan seguro/a estás?
nada
'How sure are you?'

Completamente seguro/a
'completely sure'
1 2 3

No seguro/a para
'not sure at all'
4 5 6 7

APPENDIX G - R CODE

Linear Mixed-effects Models

Packages used: afex , lmerTest

Commands:

attach(NameOfData) - Allows variables in the dataset (“NameOfData”) to be called using shorter annotation, effectively permitting “NameOfData\$SocialGroup” to be called as “SocialGroup”.

mixed(Model1, NameOfData) - Obtains fixed main and interaction effects with p values via a generated ANOVA table.

diffsmeans(Model1, test.effects=“IndependentVariable1”) - Runs post-hoc analyses for all factors interacting with specified independent variable.

summary(Model1) - Obtains regression coefficients for all fixed effects and estimates of variance of random effects.

Example: Mixed-effects linear regression testing for fixed effects of syllable position (“Position”), surrounding segment place of articulation (“Coarticulation”), Catalan cognate status / word class (“CogWordclass”), Catalan exposure and usage group (“SocialGroup”), age (“Age”), gender (“Gender”), and style (“Style”), as well as interactions between Catalan exposure and usage group with each of the other independent variables. Speaker (“Subject”) included as random effect. Dependent variable as normed F2 (“Formant”). (Results appear in table 10).

```
NameOfData <- read.csv(file.choose(),header=T)
```

```
attach(NameOfData)
```

```
Model1 = lmer(Formant ~ SocialGroup*Age + SocialGroup*Gender + SocialGroup*Style +  
  SocialGroup*Position + SocialGroup*Coarticulation + SocialGroup*CogWordclass +  
  (1|Subject))
```

```
mixed(Model1, NameOfData)
```

```
diffsmeans(Model1, test.effects=“SocialGroup”)
```

```
summary(Model1)
```

Chi-square Tests

Packages used: polytomous

Commands:

rbind(row1,row2) - Facilitates creation of data matrix for manually entered count data.

chisq.test(Model1) - Runs Chi-square test on the data.

chisq.posthoc(Model1) - Runs post-hoc cell-wise comparisons on the data.

Example: Chi-square test on the proportion of laterals produced with or without velarization degrees of 0.703 or lower across the Catalan exposure and use groups (GroupA: 368-with, 592-without; GroupB: 112-with, 830-without; GroupC: 5-with, 962-without; GroupD: 0-with, 592-without). (Results appear in table 13).

```
row1 <- c(368,112,5,0)
```

```
row2 <- c(592,830,962,592)
```

```
Model1 <- rbind(row1,row2)
```

```
chisq.test(Model1)
```

```
chisq.posthoc(Model1)
```