

*Yeísmo* in Central Argentina: A sociophonetic study of the diverse palatal variation in  
the city of Córdoba

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## **DEDICATION**

I dedicate this work to the pillars of my life: my husband, Tim; my children, Daniel and Andrea; my mother, Raquel; my brother, Gustavo; my daughter-in-law, Julie; and to the memory of my father, Luis; and of my grandmother, Noni.

Y a mi amada Córdoba, La Docta.

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## ABSTRACT

The focus of this dissertation is to explore the state of *yeísmo* in the city of Córdoba. The linguistic phenomenon of *yeísmo* has produced variants of /j/ that have followed different paths throughout the Spanish speaking world. In Argentine Spanish, the bulk of the research has focused on the trajectory of the voiced palatal fricative /j/ through a process of strengthening into the voiced postalveolar fricative [ʒ] followed by devoicing into the voiceless postalveolar [ç] in Buenos Aires, the capital of Argentina. This shift has attracted the attention of multiple researchers who have concentrated their sociolinguistic research on the evolution and completion of the phenomenon of devoicing in Buenos Aires or on comparing the extent of devoicing in the capital to that of other provinces and assessing to what extent the phenomenon is spreading outside of Buenos Aires. Studies concentrating specifically on describing the characteristics of *yeísmo* in other regions of the country are notably lacking.

The present study investigates the wide variation found in the articulation of /j/ for orthographic <y> and <ll> in Córdoba, and the social and linguistic factors that govern these realizations. Sixty-five residents of Córdoba balanced by age, gender, and socioeconomic hierarchy participated in the study consisting of recorded Sociolinguistic Interviews and oral readings of a paragraph and a list of minimal pairs containing the targeted features, as well as a picture naming task. Segmental and acoustic analyses of the tokens were performed with Praat (Boersma & Weenink, 2018). Results indicate that alternation between [ʒ] and [dʒ] seems to have reached a stable status across social classes and ages. The production of [ç] is favored by the less affluent, less educated members of the community living in low-income neighborhoods, as well as by men. Additionally, the analyses revealed a continuum of sonorization with early signs of devoicing among the women, and especially women in more affluent neighborhoods.

The contribution of this study is fourfold as it provides evidence that suggests that: i) there exists sociolinguistic variation in *yeísmo* in the interior of Argentina that differs from that in Buenos Aires; (ii) other regions in Argentina produce variants other than only [ç] and [ʒ]; (iii) what is a prestige feature in some regions may be a

stigmatized feature in others; and (iv) the phenomenon of *yeísmo* is a dynamic force that correlates with social and linguistic factors and continues to evolve and spread in the territory of Argentina, but possibly in patterns that differ from that of Buenos Aires *yeísmo*, due in part to a strong sense of local identity.

*Keywords:* *yeísmo*, variation and change, sociolinguistics, sociophonetics, palatal fricatives, Córdoba, Argentina

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## CHAPTER 1

### INTRODUCTION

#### 1.1 Sound variation and change

Language variation is an integral part of every language (Tagliamonte, 2012), but not all of linguistic variation in a speech community leads to change. A speech community may display linguistic variation that remains stable across time. However, all linguistic change, whether it be change from above or from below (Labov, 1966b, 1994) manifests itself first in the form of variation (Weinreich et al., 1968, p. 188). Human languages possess the unique traits of productivity and creativity which lead to changes in the forms of additions, eliminations, or redistribution of linguistic features in all of their manifestations from phonological to syntactic and pragmatic (Hockett, 1965; Hualde, 2010). At the phonological level, sound change implies that over time the phonemic inventory of languages may suffer the loss, rearrangement, or addition of phonemic properties. While scholars may not agree on the source and motivation of sound changes (Bybee, 2012; Labov, 1994; Ohala, 1989, 1993; Pierrehumbert, 2002), the undisputable fact remains that sound changes can occur at either phonemic or allophonic level manifesting themselves through different phonological processes (Hualde, 2005, 2010).

The most common phonological sound changes documented correspond to mergers, splits, and chain shifts (Gordon, 2002; Labov, 1994). Chain shifts primarily pertain to vocalic shifts, as is the case with the Great Northern Vowel Shift and the California Vowel Shift in English (Labov et al., 2006; Podesva et al., 2015). The Spanish vowel system across dialects presents marked symmetry and simplicity.

Consequently, phonological changes in Spanish in no-contact varieties are rare to occur at the vowel level (Hualde, 2005). Sporadic instances of vowel modifications in Spanish include the deletion or shortening of unstressed vowels particularly before /s/ in Mexican and Andean Spanish, and the raising of mid vowels /e/ and /o/ in Eastern Andalusian Spanish, a region where final /s/ undergoes deletion and the vowel rising marks singular-plural differentiation (Alvar, 19573; Hualde & Sanders, 1995; Navarro Tomás, 1939; Sanders, 1998; Villena Ponsoda, 1987). In recent years, researchers have turned their attention to vowel sequences. For example, Garrido (2008) investigated the diphthongization of non-high vowels in the speech communities of Bogotá and México, D.F. while other studies have focused on rising vowel sequences in hiatuses and diphthongs (Cabré & Prieto, 2006; Hualde & Prieto, 2002; MacLeod, 2007). Beyond occasional studies on vocalic changes, the bulk of the sound variation and change in Spanish corresponds most often to consonantal mergers and allophonic variation and change.

Among the sound changes that the Spanish language experienced in its development from Latin, the phenomenon of *yeísmo* constitutes one that began as the phonemic merger of the voiced palatal phonemes /ʎ/ (lateral) and /j/ (fricative) and has since evolved into a change of allophonic nature throughout most of the Spanish speaking world (Penny, 2002). Of special interest to researchers is the path that this change has followed in the region known as Río de la Plata, namely Buenos Aires and Montevideo, the capital cities of Argentina and Uruguay respectively. This work, however, addresses the current state of *yeísmo* in the city of Córdoba, the second largest metropolitan area of Argentina.

### **1.1.1 Phonemic sound change**

Phonemes are defined as the smallest distinct units of sound that do not carry meaning in themselves. However, changing one phoneme in a word for a different phoneme, or altering the order of phonemes results in words with different meanings. Therefore, phonemes are said to be contrastive in nature (Hualde, 2005).

#### **1.1.1.1 Mergers**

At the phonological level, linguistic changes often result in the elimination of a phonemic opposition as two contrastive phonemes merge into one. As Gordon (2013) explains it, a merger is an invasion of one sound into the phonological boundaries of another without the latter undergoing changes. An unconditioned merger results in the reduction of the phonemic inventory of a language when the contrast has been completely lost in all phonological contexts and the merged phoneme disappears from usage in both production and perception. On the other hand, a conditioned merger retains the phonemic opposition in certain contexts while the distinction is neutralized in others (Gordon, 2015). Two of the most researched mergers in Spanish correspond to the loss of phonological oppositions that have had an impact on virtually all Spanish dialects (Kania & Kauffeld, 2005). *Seseo* and *ceceo* refer to two phenomena that surfaced as the result of the reduction in the inventory of medieval Spanish sibilants. Such reduction followed different courses in the Castillian and Andalusian regions. In Castillian Spanish the four sibilants /ts/, /dz/, /s/, and /z/ were reduced to two voiceless sibilants, fricative interdental /θ/ and fricative alveolar /s/. This distinction is known as *ceceo*. In contrast, in Andalusia the four sibilants merged into a single phoneme /s/ and this lack of distinction has been referred to as *seseo* (Penny, 2002). In recent years,

*ceceo* has been approached as a case of split or demerger in certain regions of Spain that appear to be reverting to distinction under the pressure of dialect contact and societal changes (Regan, 2017b, 2020b). In the same manner, *yeísmo*, the loss of /k/ - /j/ contrast, began as a merger but has since developed into a change of allophonic nature in which the main focus of study is not distinction but variation among the different allophonic manifestations of /j/ prompted by both linguistic and extralinguistic factors (Colantoni, 2006a; Rohena-Madrado, 2013). In the English language, the loss of distinction between once-contrastive English vocalic phonemes such as /ɒ/ - /ɔ/ (CAUGHT - COT), /ɪ/ - /ɛ/ (PIN - PEN), and /e:/ - /i:/ (MEAT - MEET) during the Great Vowel Shift in the 15<sup>th</sup>-19<sup>th</sup> centuries is among the most researched merger phenomena (Krug, 2017; Labov et al., 2006; Stockwell, 2002).

Some mergers have been labeled *near* or *apparent* mergers (Labov et al., 1972, 1991; Labov, 1994). In this intriguing case, individuals produce a subtle distinction but are not capable of perceiving the contrast they or others produce. Cases of near mergers continue to surface in the research, with Labov et al. (1972) and Labov (1994) finding some of the first instances in their investigations of the /ul/ - /ʊl/ contrast (FOOL - FULL) and the /ɛr/ - /ʌr/ contrast (FERRY - FURRY).

### **1.1.1.2 Splits**

In contrast with mergers, a change that generates an addition of a previously nonexistent phoneme or the reentry of a previously merged phoneme in the inventory is referred to as a phonemic split or demerger. Possibly due to the complex task of coming to a consensus in the definition of phonemic contrasts among schools of

phonology (Kiparsky, 2016) and because splits appear to be intertwined with phenomena of mergers and near mergers, research on splits is meager compared to that of mergers, especially in languages other than English (Johnson, 2007; Maguire et al., 2013; Regan, 2017b, 2020b). Splits have been documented in vocalic sounds of South African English dialects, such as the split of the phoneme /I/ into two contrastive phonemes, /I/ and /i/, known as the “KIT - BIT” split (Wells, 1982). In the Mid-Atlantic region of the United States stretching from New York to Baltimore, a split of /a/ into lax and tense articulations has drawn the attention of researchers who have followed its development since the late 19<sup>th</sup> century (Babbitt, 1896; Ferguson, 1975; Labov, 1989; Trager, 1930, 1940).

Little research on splits in Spanish exists, with rare exceptions such as Regan’s (2020b) study on the Spanish merger of *ceceo* in two locations of Andalusia providing evidence of the split of a full merger (*ceceo*) into a two-phoneme system of /s/ and /θ/ (*distinción*) triggered by the pressure of dialect contact and societal changes. This work indicated that splits from prior mergers as changes from above are indeed possible under sufficient social pressure and the motivation to conform to external prestige variants. In fact, the split of *ceceo* and *seseo* into *distinción* has been documented as a change in progress across Andalusia, such as in Málaga (Ávila, 1994; Lasarte Cervantes, 2010; Molina-García, 2019; Villena, 1996; Villena Ponsoda & Requena Santos, 1996), Granada (Melguizo, 2007; Moya Corral & García Wiedemann, 1995; Moya Corral & Sosiński, 2015), Jerez (García-Amaya, 2008), Huelva and Lepe (Regan, 2017a, 2017b, 2020b), and Sevilla (Gyldafottir, 2018; Santana Marrero, 2016, 2016-2017).

### 1.1.2 Allophonic sound change

In spite of the apparent stability of phonemes, phonetically speaking one same phoneme can be, and most of the time is, produced with different articulations by the same speaker repeating the same word consecutively. These variants, triggered by a variety of factors such as phonological environment, formality context, and speaker style among others, are referred to as *allophones* of a phoneme. For example, the Spanish phoneme /d/ can have three different realizations: [d], [ð], and [Ø] (elision) depending on its location in the word or phrase. In the word *candado* ‘lock,’ the first instance of /d/ is articulated as the stop dental allophone [d] while the second is pronounced as the approximant allophone [ð] or [Ø], depending on the dialect. These pronunciations are said to be in complementary distribution as one occurs in certain phonological contexts where the other normally would not. In free variation, allophones are produced in any phonological context depending on factors of the individual’s style or formality of speech. However, allophones are not contrastive in nature in that whether they are in complementary or free distribution, the meaning of the word in which they are located does not change (Hualde, 2005, 10-11). In the case of *yeísmo*, the palatal phoneme /j/ presents a number of allophones corresponding to varying degrees of constriction and voicing. While different allophones of /j/ have been identified, the variation in their distribution is far from consistent not only throughout Spanish dialects but also within local communities and even individual speakers.

In a study reevaluating the traditionally stable weakening of [tʃ]>[ʃ] in Chihuahua, Mexico, Méndez (2017) found the presence of a progressive shift in the

increasing rate of usage by men, as opposed to findings in the 1990s which showed the prevalence of this weakening among women (Amastae, 1996). This variation appears to obey social pressures made evident by increasingly information availability due to technology, which has made women aware of the social connotations of [ʃ], thus shifting back to [tʃ], while males covertly maintain their prestige by favoring the weakened [ʃ].

In contrast with the above examples of stable variation, an allophonic sound change is said to have occurred when such variation has led to changes in the phonetic distribution and behavior of allophones caused by both linguistic and extralinguistic factors. The completion of the devoicing of [ʒ]>[ʃ] in Argentine Spanish (Rohena-Madrazo, 2015) serves as evidence of an allophonic change that has largely replaced one allophone for another in the capital area of Argentina. Colantoni (2006a) explored a possible change in progress of palatals and rhotics in regions outside of the capital of Argentina, suggesting that the presence of microvariation at the time of the study may be leading to macrovariation and consequently allophonic change in the future. The ongoing lenition process of [tʃ] > [ʃ] in Panama (Cedergren, 1974), which reached community-wide alternation, stands in contrast with the stable variation recorded in Chihuahua (Méndez, 2017), where one variant is favored as a marker of prestige within members of specific sectors of the social hierarchy. A contrasting scenario is found in regions of Andalusia where the locally favored voiceless variant [ʃ] appears to be undergoing change in favor of the supra-local Castillian variant [tʃ]. Such has been the case in Málaga (Melguizo Moreno, 2007; Villena Ponsoda, 1996), Granada (Moya Corral & García Wiedermann, 1955a, 1995b); and Huelva (Regan, 2020a).

### **1.1.3 Linguistic and social motivations for sound change**

Ample research within the field of phonetics and phonology provides evidence indicating that sound change is rule-governed, that is, it does not occur in random patterns. Sound change can be tightly linked to physical constraints of the human vocal tract as well as language-specific laws acquired naturally by native speakers (Foulkes & Docherty, 2006). Physical constraints include limitations of the vocal tract of different nature: anatomical, aerodynamic, elasto-inertial, neuro-muscular, and acoustic (Ohala, 1989). For example, among the aerodynamic constraints that have led to sound change in some languages are voicing and frication rates, both of which are tightly connected to specific physical characteristics of the vocal tract and its ability to handle the pressure of the flow of air, affecting the vibration of the vocal cords. Instances of sound change of plosives derived from voicing aerodynamic constraints have been reported in Chinese (Chao, 1936) and in Mayan (Pinkerton, 1980). The turbulence produced by the air flow as it encounters a barrier in oral cavity, known as frication, can show varying degrees of intensity and this range is heavily dependent on the physical attributes of each individual's vocal tract. In English, the noised release of stop /t/ before /j/ or /i/ has led to two variants: /tjune/ and /tʃune/, the latter displaying frication (Ohala, 1989).

While a logical approach to investigate sound change is to focus on such constraints related specifically to structural features, phonetic context, word frequency, and other such matters, the social context in which language occurs cannot, according to other linguists, be overlooked. In fact, Labov (1963, p. 275) states that "... social pressures are continually operating upon language, not from some remote

point in the past, but as an immanent social force acting in the living present.” The field of sociolinguistics addresses the role of external social factors in linguistic variation and change within a speech community (Medina-Rivera, 2011). More specifically related to individual sound change, Sociophonetics explores socially conditioned sound variation by analyzing the relationship between sound change and social factors as indicators of social identities or stances (Foulkes & Docherty, 2006; Hay & Drager, 2007). Within this framework, variation in speech refers to different ways of expressing the same thing, with each alternative carrying social significance (Fasold, 1991, pp. 223–224; Labov, 1972). For example, in his pioneering study in Martha’s Vineyard, Labov (1963) found that a change in the articulation of the diphthongs /ai/ and /au/ was triggered by the social motivation to maintain and reaffirm the identity of islanders in contrast with that of outsiders.

With the advent of highly accessible technological tools for acoustic analysis, the phonetic detail of sound variation facilitates the detection of a wide range of variation in a gradient scale that can provide more solid evidence of the relationship between sound variation and change and the social and linguistic forces that operate behind them (Hay & Drager, 2007).

## **1.2. Methodological approaches to sound change**

### **1.2.1 Language variation and change / Variationist Sociolinguistics**

Speech does not occur in isolation from social values and ideologies; rather, traits of social and individual identity are attached to individuals’ linguistic choices, which in turn create in the mind of the recipient an image of the speaker’s age, sex, socioeconomic status, education, geographic origin, and mood, among many other

factors (Díaz-Campos, 2014). The field of sociolinguistics explores this dynamic interplay between language and the social and cultural contexts in which it occurs, and thus it encompasses a variety of sub-disciplines depending on the aspect of language upon which the research focus rests (Tagliamonte, 2012).

The present dissertation is framed within the first wave of variationist sociolinguistic approaches known as Language Variation and Change (LVC) that began with William Labov's pioneering research in New York City in the 1960s and early 1970s (Labov, 1966b)<sup>1</sup>. A foundational tenet of LVC posits that variation is an intrinsic component of language (Labov, 1969). However, fluctuations in linguistic choices occur in a systematic order rather than in a haphazard manner and are governed by internal linguistic factors as well as external social pressures. Linguistic change is seen in relation to general broad categories of social stratification where members of the speech community to be studied can be allocated. (Eckert, 2012). These major demographic categories correspond to sex, age, socioeconomic class, education, and ethnicity. Linguistic behavior, then, is a reflection of the status of individuals in the socioeconomic hierarchy of a community. Labov (1969) referred to linguistic alternations as an orderly differentiation to describe spontaneous language use in ordinary everyday circumstances. This vernacular speech is defined as “the style in which the minimum attention is given to the monitoring of speech” (Labov et

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<sup>1</sup> While first-wave studies focus on broad demographic social categories to explore variation and change, second and third wave studies utilize ethnographic approaches to explore local categories unique to each speech community or individual, with the third-wave paying special attention to a speaker's linguistic agency, regardless of their sociodemographic background (Eckert, 2012). All three waves inform one another and form “part of the same ocean” (Schilling, 2013, p. 343) and contribute valuable information to reveal the meaning of linguistic patterns.

al., 1972, p. 208), “everyday speech” (Sankoff, 1980, p. 54), and “real language in use” (Milroy, 1992, p. 66). Because of its spontaneity and inattention to standard linguistic forms, the vernacular constitutes a natural object of study within which to collect data reflecting the targeted variation both within and among speakers. The Sociolinguistic Interview represents the standard method conceived within Labov’s LVC sociolinguistic approach to elicit and collect linguistic data that will provide evidence that language variation and change are closely correlated to the social stratification of a community. The Sociolinguistic Interview is defined as “a controlled speech event designed to elicit a wide range of contextual styles from an individual speaker. During analysis, a linguistic variable (or variables) is quantified across these contextual styles to arrive at a range of that speaker’s production” (Becker, 2013, p. 92). Within the framework of the first wave of studies of language variation and change, it is maintained that individuals modify their speech depending on the formality level of the linguistic output, moving closer to a more standard or careful form as the level of attention and formality increases (Eckert, 2012; Labov et al., 1972), indicating that the concept of prestige associated with a socioeconomic hierarchy is present at least at some level in the speaker’s awareness. However, individual speaker’s variation across styles represents one among other purposes for this type of interview; the intra-speaker variation patterns that emerge can diagnose *linguistic variation* and potential *change in progress* in a community (Sankoff, 2006), two foundational tenets of Labovian variationist sociolinguistics (Becker, 2013). Style shifting can in fact be analyzed from three broad perspectives depending on the element during speech that causes such shift: the level of conscious attention paid to

the individual's own speech (Labov et al., 1972) the composition of the audience being addressed (Bell, 1984), and the use of speech as a resource for the individual to align with a specific identity or embody a stance (Coupland, 2010; Kiesling, 2009). Within the first wave of variationist studies, Labov utilizes the Sociolinguistic Interview as a way to steer individuals away from focusing excessively on the formality of his speech and instead mimic as much as possible "how people speak when they are not being observed" (Labov et al., 1972, p. 113). The addition of tasks in other stylistic contexts in which awareness to speech is raised (such as reading of a passage, reading of word lists and minimal pairs, etc.) constitutes a useful tool that examines whether or not speakers vary across styles in response to alterations in the surrounding context, perhaps shedding light into whether a variant is an indicator that correlates with social class, a marker associated with social class and stylistic stratification, or an inconspicuous, stigmatized stereotype (Labov, 1972, 2001; Tagliamonte, 2012). Changes, or lack thereof, across styles can allow researchers to detect a *change in progress* or *stable variation* in a community (Sankoff, 2006), two foundational tenets of Labovian variationist sociolinguistics (Becker, 2013). In short, Labov's principal objective is to bring to the surface an individual's most regular and least conscious style in which attention to speech formality is at its minimum (Schilling, 2013).

Not all linguistic variation in a speech community indicates the presence of linguistic change. In a speech community where linguistic variation can be observed in association with social stratification and stylistic modifications without differences in gender or age, it can be said that this variation is stable. On the other hand, a

linguistic form initiated and favored by women and the younger generations that advances through time replacing another previous form refers to a change in progress (Labov, 1994).

In the 1960s, Labov reevaluated the question of whether change in progress can be observed in ways other than diachronic monitoring. He achieved this through a method that consisted of tracking linguistic variables synchronically across age groups at one time in history, specifically in the speech communities of Martha's Vineyard (1963) and New York City (1966). This approach, known as studies *in apparent time* (Labov, 1994), focuses on uncovering patterns that allow researchers to assess the nature of linguistic variation within a speech community. This technique had been utilized since the early 20<sup>th</sup> century, but it was in the late 1960s that it became one of the core principles on which LVC research is conducted and has since come to be considered “the most striking single accomplishment of contemporary linguistics” (Chambers, 2007, p. 160; Cukor-Avila & Bailey, 2013). Studies *in real time*, that is, following the same individuals through their life span, are less common due to the challenges that such investment of time and resources represents for both researcher and participants. While studies *in apparent time* are not without limitations as well, they have proved to be fruitful for the analysis of linguistic changes when data *in real time* is not readily available.

### **1.2.2 Laboratory phonology**

The Association for Laboratory Phonology defines this approach as “the scientific study of the encoding elements of spoken language, their organization, their grammatical function, and their role in speech.” (labphon.org). Because linguistic

variation is systematic, such variation can be quantified through the collection of a large corpus of speakers in order to uncover significant patterns of use applying statistical techniques (Cedergren & Sankoff, 1974; Labov, 1963, 1969; Poplack & Tagliamonte, 2001). Given the need to quantify phonetic data for statistical analysis, the present study is conducted following experimental methods of Laboratory Phonology. This term, coined by Janet Pierrehumbert in the 1990s, denotes a multidisciplinary experimental and quantitative approach that addresses questions related to elements of language by bridging the gap among a host of disciplines that have traditionally conducted research independently from one another. These disciplines include phonetics, phonology, psycholinguistics, computational linguistics, sociolinguistics, and first and second language acquisition, to name a few (Cohn, 2011; Pierrehumbert et al., 2000). Laboratory Phonology encourages and welcomes the methodological advances of all fields that can inform issues of phonology at more fine-grained levels. Colantoni (2011) explains that Laboratory Phonology utilizes experimental techniques to collect, analyze, and quantify the data, and suggests that such an approach does not only refer to the methodological tools or the foundational theories or frameworks used, but it should be taken into consideration at the initial stages of design (research questions, hypothesis, etc.) of any study using this manner of data handling. Because a goal of Laboratory Phonology is to uncover patterns of language use, an increased awareness of linguistic variation has surfaced and spurred further research on variation in relation to social factors, which in turn has contributed to the development of sociophonetics theories and practices.

Laboratory phonology studies utilize different types of instruments to collect and analyze speech in a more detailed manner than a mere reliance on the researcher's auditory and phonetic transcription skills as has been the case in the vast majority of variationist research in Spanish. Beyond simply using a recorder to capture speech, laboratory phonology involves utilizing high-quality recording instruments and transferring the recording to specialized computer software for the analysis of the adequate acoustic measures that will yield quantifiable measures suitable for statistical operations (Hayward, 2014). The emergence of important research tools such as Praat (Boersma & Weenink, 2018) has made it possible for researchers to abandon exclusive reliance on complex laboratory facilities to conduct experimental research. Laboratory phonology capitalizes on socially stratified variation by recruiting members of a speech community representing a range of socioeconomic levels who are prompted to produce unrehearsed speech in a variety of tasks during the Sociolinguistic Interview (Scobbie & Stuart-Smith, 2012). While the integration of laboratory phonology with variationist research is in its initial stages, it has clearly proven to be an advantageous approach to uncover additional contributing factors to variation as well as provide the tools necessary to analyze phonetic features at a more meticulous level (Scobbie & Stuart-Smith, 2012).

Colantoni (2011, p. 15–16) provides a review of sociolinguistic studies exploring variation and change in Spanish using Laboratory Phonology approaches, such as rhotics and laterals in Argentina (Colantoni, 2006a, 2006b), rhotics in the Dominican Republic (Willis, 2006; Willis & Bradley, 2008), liquids in Puerto Rico (Simonet et al., 2008), voiced and voiceless stops in Peninsular and Colombian

Spanish (Lewis, 2001), and articulation differences of /s/ in coda position (Valdivieso & Magafia, 1991) to name a few. Studies in *yeísmo* that have utilized laboratory phonology have especially been fruitful in research on Argentine Spanish, as they have uncovered a wide range of variants present in this region. Fontanella de Weinberg (1994) and Chang (2008) identified six different allophonic manifestations of *yeísmo* in Buenos Aires, in agreement with Colantoni (2006a), who suggests that the entire continuum must be considered, from the most voiced approximant semivowel [j] at one end of the spectrum to the devoiced variant [ʃ] at the other. Additionally, a laboratory phonology approach offers opportunities for innovative studies such as that of Rohena-Madrado (2015), which explored the completion of devoicing of [ʒ] in Buenos Aires by comparing it to the voicing features of [s].

### **1.3. This study**

The focus of this dissertation is to explore the current state of *yeísmo* in the city of Córdoba, Argentina, combining methods from variationist sociolinguistics and laboratory phonology. This study aims to contribute to the field of sociolinguistics by addressing an existing gap in the investigation of the ongoing evolution of *yeísmo* in the understudied city of Córdoba. While in some dialectological areas this phenomenon has shown long periods of stability and little change, in other communities *yeísmo* has been steadily evolving and undergoing important shifts linguistically and socially. In fact, Córdoba presents an interesting case where a change in progress may be occurring from [j] to [ʒ]/[dʒ]>[ʃ] in which [j], different from much of the Spanish-speaking world, receives overt social stigma.

This dissertation is organized as follows: Chapter 2 provides an overview of previous relevant literature on *yeísmo* in Spanish-speaking regions. A historical, geographical, and demographic survey of the speech community in Chapter 3 situates the reader in the social context within which the study was conducted. Chapter 4 introduces the research questions, instruments, participants, and methodology employed in this study. Statistical results are presented in Chapter 5 followed by a discussion of the implications of results in Chapter 6. Finally, a closing section is devoted to the conclusion and final remarks, including limitations and recommendations for future studies.

## CHAPTER 2

### PREVIOUS STUDIES ON YEÍSMO

#### 2.1 The linguistic variable: /j/

*Yeísmo* has been described as a dephonologization process leading to a merger. As explained by Hay and Drager (2007, p. 458): “Merger is a process [...] in which sound change leads to the collapse of a phonemic contrast, so that what were previously two distinct phonemes in a dialect come to be realized as a single phoneme.” *Yeísmo* refers to the merger of the once distinct Spanish palatal phonemes /ʎ/ and /j/ in one single phoneme /j/ for orthographic <ll> and <y> (Hualde, 2005). Known as *lleísmo*, the distinction between /ʎ/ and /j/ is contrastive in nature, as shown in Table 2.1, where /ʎ/ and /j/ constitute minimal pairs marking a difference in spelling, articulation, and meaning of the words *haya* ‘that there be,’ and *halla* ‘she finds.’

**Table 1**

*The Contrastive Nature of Lleísmo Lost in the Phenomenon of Yeísmo*

	<b>Lleísmo (Distinction)</b>	<b>Yeísmo (Merger)</b>
<b>Haya</b> (that there be)	[ájja]	[ájja]
<b>Halla</b> (she finds)	[áʎa]	[ájja]

Although the orthographic spelling of words with <ll> and <y> has remained unchanged, the merger of these two phonemes into /j/ eliminated the phonemic

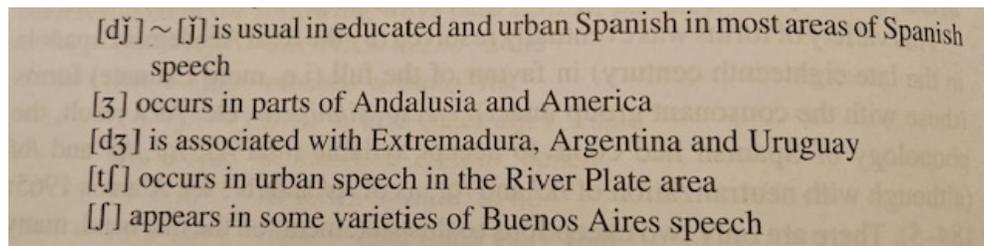
contrast and therefore reduced the phonemic inventory of the majority of Spanish dialects.

Among the many changes that the Spanish language experienced in its development from Latin, the phenomenon of *yeísmo* is considered to be one of the slowest and most complex, given, among other things, its connection with the process of evolution of the medieval sibilants and other consonant clusters (Parodi, 1977; Penny, 2002). In relation to the historical time in which this phenomenon saw its beginnings, Penny (2002, p. 106) reasoned that the merger of the two palatals probably saw its origins as early as the 16<sup>th</sup> century, as attested in documents written in both Judeo-Spanish and early American Spanish. Other scholars identify the dawn of the merger as far back as the Middle Ages (Ariza, 1994; Cano-Aguilar, 2004; Chamorro Martínez, 1996; Frago, 1993; Penny, 2004). Similarly, there is no agreement regarding the geographical location of its origins, with some investigators pointing at the region of Andalusia in southern Spain, while others provide evidence that suggests the northeastern region of Aragón (Rost Rost Bagudanch, 2017). Having reached its completion toward the end of the 16<sup>th</sup> century (Cuervo, 1901), the /ʎ/-/j/ merger then became the predominant characteristic in the speech of the inhabitants of Andalusia and many parts of Castilla.

After early Spanish settlers arrived in the Americas in the late 15<sup>th</sup> century and continued their to-and-fro conquest voyages well into the 16<sup>th</sup> century, *yeísmo* spread, continued to evolve, and eventually became the norm in the New World, except in isolated highlands of Andean regions (Menéndez Pidal, 1929). From a dialectological point of view, the development of *yeísmo* in the Americas has been associated with the

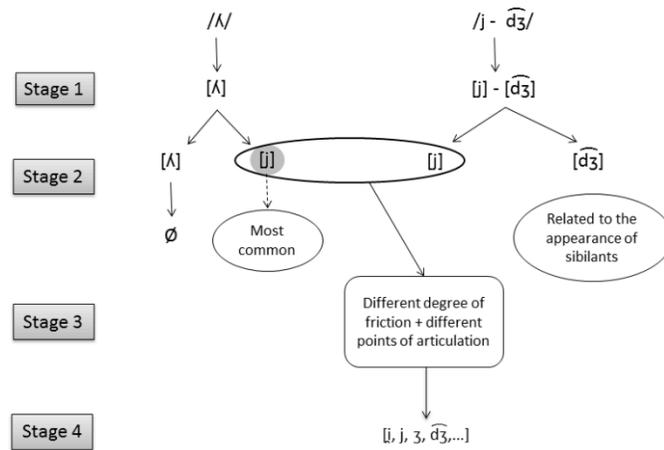
accessibility of the different regions of the New World to the linguistic shifts taking place in Spain at the time, particularly in Andalusia (Resnick, 1981). Those areas with more frequent contact with innovative peninsular influences, such as Mexico, the Caribbean, and low coastal lands, are characterized by the production of /j/ as [j] and in fewer cases an affricate variant [dʒ] (Azevedo, 2009). The old distinction between /j/ and /k/ is maintained in the vernacular of more conservative highlands of the Americas such as the Andean areas of Ecuador, Perú, Bolivia, and northwest Argentina, where contact with peninsular influences was much more limited earlier during the colonization era characterized by dynamic linguistic shifts (Canfield, 1981).

Regardless of the chronological and geographical origins of *yeísmo*, the evolution of this phenomenon has proceeded through time in stages, resulting in a gradient frication and voicing scale in the articulation of allophones of /j/, as noted by Penny (2002, p. 106) in Figure 1. This scale ranges from the most voiced and least fricative semi-consonant variant [j] to the completely devoiced variant [ʃ] and includes gradient possibilities in between.



*Figure 1.* Various pronunciations used among speakers in regions where merger of the two phonemes is the norm (Penny, 2002, p. 106).

Moreno-Fernández (2004, pp. 984–985) proposes four stages in the evolution of *yeísmo* with the corresponding regions where different variants have been identified as the underlying norm (Figure 2). Stage 1 corresponds to the retention of the /k/-/j/ contrast, while in Stage 2 the phonemic opposition has been lost in favor of /j/, with particular preference to approximant articulations. In Stage 3, while the merger is still preserved favoring /j/, it shows a number of allophonic manifestations with varying degrees of frication, voicing, and points of articulation. Stage 4 presents variants of /j/ that have undergone a process known as *rehilamiento* in Spanish, which refers to the strengthening and therefore increasing degree of frication of [j] into [ʒ] – a phenomenon known as *zeísmo* – and the assibilation and subsequent devoicing into the voiceless palatal allophone [ç], or *sheísmo*. On no account does this change represent a uniform situation; *yeísmo* as an allophonic change has advanced and continues to advance and evolve at different rates and following diverse paths in Spanish speaking regions. In broad terms, while Central America and the Caribbean remain largely between stages 2 and 3, Peninsular Spanish appears to have moved to stage 3. The region of the Río de la Plata (Argentina and Uruguay) can be said to have reached stage 4, as characterized by the strengthening of the palatal /j/ in its various fricative allophones (Rost Rost Bagudanch, 2017).



*Figure 2.* Four stages of yeísmo as proposed by Moreno-Fernández (2004, pp. 984-985). Stage 4 represents current status of yeísmo in the Río de la Plata region (Argentina and Uruguay).

Variation in the articulation of allophones of a phoneme obeys external factors as much as internal rules of the phonological system of a language (Bybee, 2002, 2012; Colantoni, 2006a; Labov, 1994; Medina-Rivera, 2011; Moreno-Fernández, 2011; Ohala, 1989; Pierrehumbert, 2002). The evolution of the variation in allophonic manifestations of /j/ appears to be related, at least partly, to conditions given in specific areas at a particular time in history, such as contact with other prestige languages whose phonological inventories include the palatal phoneme in question, such as Catalan (Torres et al., 2013), Galician (Dubert García, 2005), and Basque (Beristain, 2020) in Spain and indigenous languages such as Quechua (Caravedo, 2013) in South America. Population mobility caused by changes in the economic dynamics of the community also represents a factor in such contact with other languages and prestige variants (Moreno-Fernández, 2004). The rapid expansion of

*yeísmo* in the Spanish-speaking world during the 20<sup>th</sup> century (Parodi, 1977; Torres et al., 2013) can be described as a change from below (Labov, 1994) that originated within the speech community itself below the level of awareness of community members.

Allophonic variation of this phenomenon ranging from [j] to the assibilated voiced postalveolar [ʒ] (*zeísmo*) progressively became the norm in Argentine Spanish, with a subsequent process of devoicing in Buenos Aires, the capital city, a region known as Río de la Plata. This process led to the production of the voiceless postalveolar fricative variant [ʃ]. The voiceless articulation of [ʃ] in Spanish is equivalent to the sound corresponding to the grapheme <sh> in English, in words such as *shoe, cash, and washer*. This devoicing (*sheísmo*) has become one of the most identifying features in the speech of Buenos Aires locals (Chang, 2008; Fontanella de Weinberg, 1973; Guitarte, 1955; Rohena-Madrado, 2015).

Outside of the capital, the city of Córdoba still displays instances of [j] as well as other variants that reflect processes of strengthening, affrication, and assibilation. Unlike in Buenos Aires, Córdoba remains in the stage where the palatal fricative [ç] represents the widespread norm, with instances of affricate [dʒ] as well as devoiced [ʃ], although the latter is far from displaying the ubiquitous nature it has acquired in Buenos Aires.

Although devoicing is finding its way in some provinces of the interior, Córdoba's historical conservative nature has shown stronger resistance to conform to the capital's norm and has largely maintained the voiced variant [ʒ] as a prestige

norm, along with [j] as a stigmatized variant. Nevertheless, instances of all four variants are expected to be revealed in the data.

## **2.2 The evolution of *yeísmo* in the Spanish speaking world**

A panoramic view of linguistic features across Spanish-speaking territories testifies to the heterogeneous paths that *yeísmo* has followed, as it is made evident through the analysis of corpora from regional linguistic atlases. Rost Bagudanch (2017), for example, found 50 possible variants for /ʎ/ alone in atlases from a variety of Spanish speaking regions. Further evidence is brought to light in surveys of the geographical distribution of this phenomenon in a number of Latin American countries, such as those conducted by Gómez and Molina (2013) and Peña Arce (2015). The phenomenon is still a long way from being a completed change in some areas, while other areas show a long period of merger stability, and yet others continue to undergo steady and dynamic processes of change.

The following sections provide an overview of the main developments of this phenomenon in broad categories of Spanish-speaking areas. Specifically, this section covers previous studies separated by the following regions: Spain, the Caribbean/Mexico/Central America, the Andean region, and Argentina.

### **2.1.1 Spain**

Although *yeísmo* in Spain probably saw its beginnings in the late medieval period in different regions of the peninsula, it was in Andalusia (Figure 3) where the conditions for its rapid spread occurred in the early 16<sup>th</sup> century (Penny, 2002). Central and northern regions traditionally remained conservative and maintained the



peninsula experimented an accelerated speed in the 20<sup>th</sup> century when it gained prestige among educated Madrid residents, and this high status soon was adopted among the educated population in other metropolitan areas as well as in the media and eventually in the Spanish varieties of Latin America (Molina Martos, 2013). Mouton and Martos (2012) assessed the advancement of *yeísmo* in Spain, comparing data gathered at three different points in history: the 1930s by Tomás Navarro Tomás, the 1980s and 1990s by Mouton and Moreno-Fernández, and 2002-2003 by Mouton and Martos. The researchers found that, while regional and generational foci still remain in which traditional /j/-/ɲ/ distinction is the norm, *yeísmo* has advanced notably even in conservative rural areas of Castilla-La Mancha. Following the historical pattern, the spread originates in the southern areas with Madrid still serving as a point of propagation, where the merger is in its completion stage in the two younger generations of *madrileños*. This suggests that this phenomenon will likely continue to broaden its path of propagation (Mouton & Martos, 2012).

The gradual nature of the merger process in Spain has been documented in studies exploring the state of *yeísmo* in a variety of peninsular dialects. Rost Bagudanch (2017), for example, found that the merger process is still a change in progress in the regions of Leon, Alicante, and Aragon, where the ongoing evolution of the Spanish palatal system is evident as attested by the assortment of allophones of /ɲ/ that coexist in these areas.

Research has shown that *yeísmo* in Madrid has been steadily spreading from the mid-lower to the upper classes of urban centers and from there to rural communities around them. Molina Martos (2013) provided a detailed description of

the state of *yeísmo* in Madrid and surrounding rural areas, noting that this area can be associated with the most advanced of the stages proposed by Moreno-Fernández (2004) with three distinct concentric levels of expansion: (1) no distinction in the central area; (2) variable distinction in areas of the metropolitan periphery; and, (3) a combination of all four stages in small towns outside of the urban center and peripheral areas. Rural areas surrounding Madrid have switched from reflecting the linguistic patterns of Andalusia to following the capital's lead and mirroring its social stratification by age, sex, and educational level.

In a study to examine different allophonic manifestations of /j/, Scarpace et al. (2015) accessed data compiled in a corpus of Peninsular Spanish and Catalan speech (Garrido et al., 2013) and analyzed 28 speakers (15 females, 13 males) presumably from Valladolid in north-central Spain, where the recordings were performed. Using intensity as the acoustic measure, they found that, while participants produced [j] primarily, they displayed a wide range of constriction patterns when correlated with phonological context and speech style.

*Yeísmo* has also been studied in language-contact regions where Spanish is in contact with other languages, such as Catalan in Catalonia or Galician in Galicia. Both Catalan and Galician possess the palatal lateral /ʎ/ in their phonological inventories. The advancement of *yeísmo* in the city of Barcelona was investigated by Torres et al. (2013) utilizing data found in the corpus of PRESEEA-BARCELONA-ES (Proyecto para Estudios Sociolingüísticos del Español de España y América). A total of 12 informants were selected for the study, six men and six women distributed equally in three age groups representing three generations. The results of this research closely

mirror those found in Molina Martos (1997) in other Spanish cities: *yeísmo* has experienced intense rates of advancement in Barcelona, placing this metropolitan center between stages 2 and 3 in Moreno-Fernández's (2004) graphic description of the evolution of this phenomenon. While distinction is still identified in isolated regions, it doesn't appear to be systematic; rather, the favored solutions seem to be variation or *yeísmo* in its complete stage. A slightly different scenario emerged in the neighboring region of Valencia, south of Barcelona, where Valencian and Castilian Spanish also coexist. In an experimental sociolinguistic study, Gómez Molina and Gómez Devís (2016) selected 72 local participants out of the PRESEVAL Corpus<sup>2</sup> which contains approximately 500,000 words in 55 hours of semi-directed interviews including narrations, descriptions, expository speech, and dialogues, among others. Selected participants were distributed equally in ethnographic categories corresponding to sex, age, area of residence, sociocultural level, habitual language, and lifestyle. The analysis of the interviews revealed three groups of speakers: (a) those who practice distinction, (b) those with high degrees of *yeísmo*, and (c) those who alternate between distinction and *yeísmo*. These results were complemented by the perception portion of the study, which consisted of two groups of judges: one group of 24 judges equally balanced according to gender, age, place of residence, and bilingualism/monolingualism levels; and a second group formed by 40 judges with the common factor of being between 20-34 years old, graduate students, equally divided

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<sup>2</sup>Proyecto para el Estudio Sociolingüístico del Español de Valencia ([www.uv.es/preseval](http://www.uv.es/preseval)). Data collected and compiled between 1997-2005 observing the methodological procedures established by PRESEA (Proyecto para el Estudio Sociolingüístico del España y de America)

according to sex, place of residence, and bilingualism/monolingualism levels. The two groups of judges listened to 10 phrases containing the two phonemes in identical vocalic environments produced by a bilingual speaker who practices distinction. While this region mirrors the variable *yeísmo* patterns displayed in Molina Martos' (1997) study of Barcelona, the authors claim that Valencia presents evidence of Stage 2 in Moreno-Fernández's (2004) proposed stages of *yeísmo*, based on the results of the corpus analysis that showed that 76% of the participants maintained [ʎ] in the linguistic repertoire in contrast with 24% who were true *yeístas*. However, based on the perception of the two groups of judges, there appears to be a change in progress suggested by the fact that variation in their judgments is correlated with sex and age, where women and young participants lead in the trend to leave behind the distinction, and men and older individuals show the highest rates of retention.

Castillian Spanish and Galician have been in close contact since the origins of both languages. Currently, older generations of Galicians maintain Galician as their first language, while younger generations are increasingly resorting to Castillian Spanish as their main language (Dubert García, 2013). Against popular belief, Galicia is a *yeísta* region, in spite of the fact that Galician possesses a lateral palatal in its phonological inventory and it exerts a strong influence on Castillian Spanish. In his structural analysis of different aspects of Galician Spanish, Dubert García (2005) posits that this is a *yeísta* region where /j/ has undergone a process of strengthening in both Castilian Spanish and Galician and is articulated as a voiced stop palatal in intervocalic position. Other realizations of /j/ correspond to a palato-alveolar affricate and occasional approximant solutions. The lateral articulation /ʎ/ remains only among

Galicians who inhabit rural areas removed from mainstream culture. When corpus data from ALPI (Atlas Lingüístico de la Península Ibérica, 1963) was compared to data from ALGa (Atlas Lingüístico Galego, 2003), evidence was found pointing to a recent rapid spread of *yeísmo* in Galicia, while the phenomenon was nonexistent according to data in ALPI in the first half of the 20<sup>th</sup> century. In the previous two environments of languages in contact (Castillian Spanish-Catalán and Castillian Spanish-Galician), Castillian Spanish appears to be exerting the stronger influence on the other coexisting language, at least in this particular case of segmental variation.

The influence of languages in contact due to immigration patterns and immigrants' lifestyles has been another topic that has attracted the attention of researchers. The political and economic unrest in Argentina during the second half of the 20<sup>th</sup> century motivated a large number of Argentines to migrate to Spain. In a sociolinguistic study exploring how Argentine immigrants accommodated their linguistic patterns influenced by Málaga Spanish, Von Essen (2016) performed an acoustic-perceptive analysis of the variants of /j/ found in the speech of three groups of participants: a) Argentines residing in Buenos Aires, b) Argentines residing in Málaga, and c) native residents of Málaga. A continuum of articulatory patterns was identified in the speech of the participants, with Malaga residents strongly favoring the palatal fricative [j] and Argentines favoring the strengthened variants [ʒ] and [ʃ]. The acoustic measures of zero crossings and segment duration were found to be strong predictors to identify the different variants, based on the tokens collected in sociolinguistic interviews. Results show a predictable sociolinguistic pattern of accommodation in which, although all immigrants showed varying degrees of

weakening and shortened duration in the articulation of [j], men appeared to be leading this trend, while women seemed to lag behind in their accommodation and tended to a higher retention of the devoiced variant [ʃ]. Historically speaking, the phenomenon of devoicing of [ʒ]>[ʃ] in Buenos Aires originated among middle class women, which matches the social status of the women interviewed in this study, and could explain the tendency to retain this kind of linguistic capital. In a later study, Von Essen (2020) examined the linguistic accommodation of young Argentine immigrants in Malaga using the same acoustic measures of zero crossings, duration, and intensity, finding that whether these immigrants shifted toward accommodation, divergence, or alternation was closely connected to the identity these immigrants wished to portray. This was also made evident in the style shifting that surfaced in the interviews based on the identity of the interviewer.

### **2.1.2 The Caribbean, Mexico, and Central America**

Historically, the Caribbean region that corresponds to the islands of Cuba, Puerto Rico, and the Dominican Republic, as well as Atlantic coastal regions of Colombia and Venezuela (Figure 4) received significant linguistic influence from Peninsular tendencies, in particular those originating in the traditionally innovative regions of Andalusia and the Canary Islands. However, in the case of *yeísmo*, neither insular nor continental speech patterns have necessarily followed the most advanced solutions. Rather, they correspond to a strong tendency toward a relaxed, weakened articulation of /j/ including cases of elision, as evidenced in results on data collected in Cuba (García Riverón, 1989, 1991) and Caribbean coastal regions of Colombia

(Rodríguez Cadena, 2008; Torres Fontalvo & Rodríguez Cadena, 2017). These peculiarities situate this region of the Spanish-speaking world in Moreno Fernandez's (2004) stage 2 of development.

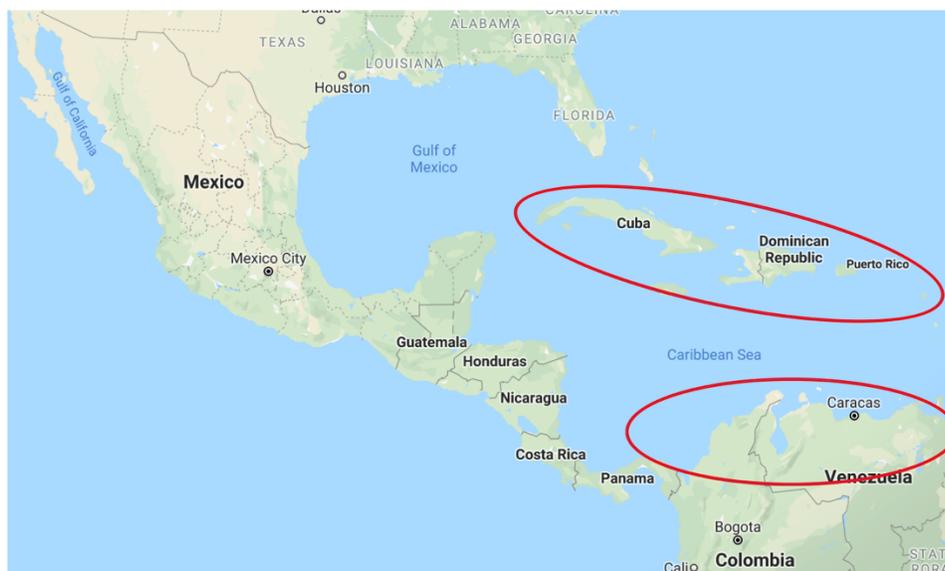


Figure 4. Mexico, Central America, and the Caribbean islands and regions in northern Venezuela and Colombia (Google Maps).

*Yeísmo* in Cuba as an established phenomenon dates back to the 19<sup>th</sup> century and was referred to as *una falta prosódica* ‘a prosodic defect’ by some authors (Pichardo y Tapia, 1875). The merger of /j/ and /ɰ/ into /j/ solidified in Cuba early on and became the standard pronunciation throughout the island regardless of social class and educational level (Almendros, 1958; Gómez & Molina Martos, 2013). Because of Cuba’s particular political events of 1959 and the social leveling economic measures taken as a result, speech patterns do not show significant differences between the urban and rural populations (Alvar, 1973; García Riverón, 1989). With social

hierarchy not constituting a relevant contributing factor in Cuba, other variables are considered in sociolinguistic studies of *yeísmo*, such as style, geographic region, and phonological context. A study of 16 key locations throughout the island included 165 recordings of colloquial speech and 33 recordings of careful speech in male and female participants within three age groups (Choy López, 1985). They found three main results: (1) the simple fricative production variant [j] predominates throughout the island, different degrees of constriction notwithstanding; (2) an affricate variant [dʒ] occurs in absolute word or phrase initial position and after a nasal consonant, except after /s/, in line with earlier findings in Haden and Matluck (1973); and (3) the highest percentage of a weakened or relaxed variant of /j/ with occasional elision was identified in informal colloquial speech in the western end of the island, decreasing progressively toward the center and eastern end. Regarding style, Isbășescu (1968) found that the alternation between the fricative and affricate variants happened in free rather than in complementary distribution. The articulation of <ll> as the lateral [ʎ] was identified in cases of hypercorrection to denote affiliation with a prestige standard. The affricate variant is used for <y> to create emphasis (Cuéllar, 1971), but never in intervocalic position (Haden & Matluck, 1973).

Sociolinguistic studies of variation and change in Caribbean regions of Colombia are scarce. To fill this gap, Rodríguez Cadena (2013) conducted a study in the coastal city of Barranquilla with 72 participants who had resided in the city for at least 20 years from an early age. The study consisted of a sociolinguistic interview that included a semi-directed conversation, a formal reading of a passage, and a reading of a word list. The participants' demographic characteristics were collected through a

questionnaire and included age, sex, educational level, class, lifestyle, social network, ethnicity, place of origin, age upon arrival, and years of residency. Linguistic factors considered were position in word and phrase, syllabic context, and surrounding phonemes. As a result of the acoustic and statistical analysis, no vowel-like, or elided palatals were identified. The two main variants used by Barranquilla residents were an approximant relaxed voiced palatal in colloquial speech of men and all speakers in the 15-17 and 36-55 age groups. These were all individuals who had completed their high school education and were in the middle and upper socioeconomic classes. The linguistic context favoring this articulation was in word-medial, post-vocalic position in a non-stressed syllable. The alternative variant was the fricative voiced palatal among women and speakers in the 18-35 and 56 and above age groups in middle and low classes and with educational levels corresponding to the two extremes: elementary and college. This articulation appeared to be favored in word-initial or phrase-initial after pause, after a consonant, and within a stressed syllable. Rodríguez Cadena concludes that the weakened variant continues to be the norm in the Colombian Caribbean region. Although the fricative palatal seems to be gaining ground among the various social levels, there are no strong indicators of a change in progress occurring at this time. Markič (2017) summarizes previous research on *yeísmo* in coastal and Andean regions in Colombia and reports that simple *yeísmo* can be considered standard for most of Colombia, with the fricative palatal [j] as the norm. However, other regions have shown alternative variants such as the affricate [dʒ] in Pacific Ocean regions and the prepalatal [ʒ] in areas south of the province of Antioquía and the north of the province of Santander (Izquierdo & Utrilla, 2002).

Eastern Andean regions tend to maintain the /k/ - /j/ distinction, although at decreasing rates (Orduz Navarrete, 2013).

Acoustic studies exploring features of Central American Spanish do not abound. Addressing this void in the research, Rosales Solís (2013) conducted sociolinguistic research with data collected in urban centers distributed across the 17 provinces of Nicaragua and recorded in ALN (*Atlas Lingüístico de Nicaragua*). The 68 participants were native residents of these cities or had resided there most of their lives. Two men and two women were recruited from each location and distributed in two age groups, 30-55 years old and 56 and older. Other social factors considered were place of origin, occupation, and level of education. The phonological context of the tokens included position in word and surrounding phonemes. For the sociolinguistic interview, a questionnaire designed by ALECORI (*Atlas Lingüístico Etnográfico de Costa Rica*) was utilized. Results indicate that Nicaragua's repertoire of *yeísmo* includes the fricative palatal [j], a weakened semi consonant [j̥], alternation between the two, elision, and dental assimilation with [d]. The fricative palatal was found to be favored after /n/ as well as in word initial position in participants from the Caribbean. This variant surfaced among the older age group in the Atlantic, Pacific, and central regions with no difference between males and females when it appeared in intervocalic position. Regarding the semi consonant [j̥], word and phrase initial position produced the higher instances with 62% primarily in the Atlantic coast and among the younger age group with no significant difference between the sexes. Elision of the palatal in intervocalic position before atonic /i/ was common in 60% of the participants, with men slightly leading women in both age groups. Women and men

displayed [j]/[j] alternation equally, while dental assimilation with [d] surfaced after /n/ and only in women of both age groups. Overall, Nicaraguan Spanish does not appear to include as wide a variety of variants in its repertoire as other countries in the vicinity such as México.

While Central America exhibits patterns similar to those of Caribbean regions, Mexico displays simple *yeísmo* throughout the national territory along with other more advanced solutions, placing these two areas in stages 2 and 3 of development respectively (Gómez & Molina Martos, 2013). One of the most recent efforts to explore the state of *yeísmo* in its geographic distribution in Mexico was conducted by Butragueño (2013) with data in ALM (Atlas Lingüístico de México). A wide variety of simple and advanced solutions for *yeísmo* was documented throughout the Mexican territory, ranging from the most relaxed, weakened approximants to isolated cases of devoicing. However, the overarching solution remains the simple *yeísmo* corresponding to the fricative palatal [j] in 66% in central-western, south eastern, northwestern, and northeastern regions, followed by the affricate variant [dʒ] in 23% of the cases in central eastern and central western regions, and the postalveolar [ʒ] represented by only 8% of the samples in the central eastern region. The almost nonexistent cases of elision in the sample were registered in south eastern, north eastern, and north western regions.

### **2.1.2 The Andean region**

South American countries whose geography is significantly impacted by the Andes mountain range are included in the Andean region: Colombia, Ecuador, Perú, and Bolivia (Figure 5). In the case of *yeísmo*, this region is known for showcasing all

four of the evolutionary stages proposed by Moreno-Fernández (2004). Unlike other regions, sectors of *yeísmo/lleísmo* distinction still exist (Lipski, 2019), with *yeísmo* representing the influences of creole-European linguistic features in the coastal districts, and *lleísmo* characterizing the speech of population in rural and urban mountainous areas (Gómez & Molina Martos, 2013).



Figure 5. The Andean region in South America (Google Maps).

*Yeísmo* in Ecuador was addressed by Gómez (2013) in a sociolinguistic study focusing on younger generations to explore the current state of this phenomenon in mountainous regions. The data was collected through sociolinguistic interviews with 30 participants between the ages of 16-29, native of the capital city of Quito or a region where /j/ is articulated as [ʒ], or who had lived in Quito from an early age (8

years old). Besides age, other demographic factors included sex, social class, and ethnicity. Four styles of speech were recorded by engaging the participants in a free conversation, the reading of a passage, reading of a list of words, and reading of minimal pairs. The phonological context of the tokens that were taken into consideration were surrounding phonemes, syllable stress, and position in word. Both social factors and speech style were found to be significant factors. The analysis provides evidence of the existence of five variants present in the speech of Quiteños: 1) prepalatal “strident” fricative [ʒ]; 2) a less strident prepalatal fricative [ʒʲ]; 3) a fricative palatal [j]; 4) a lateral palatal [ʎ] and 5) a voiceless fricative palatal [j̥]. While the coastal region has traditionally been associated with the fricative palatal [j], the mountainous region underwent a process of strengthening that placed this area in the category of *zeísta*. Results showed that a change in progress favoring the fricative palatal [j] (*yeísmo*) instead of prepalatal “strident” fricative [ʒ] (*zeísmo*) is occurring, indicating that the mountainous region may be leveling with coastal dialects in a regression process from strengthening to weakening. This change is being led by upper class women in the age group investigated, alternating between [j] and the mid-point variant [ʒʲ]. Middle class participants almost exclusively articulate [ʒʲ]. The increasingly constricted variants [ʒ] and [j̥] were only heard in lower class participants, which suggests these two variants may carry a stigma. The lateral palatal [ʎ] is increasingly disappearing, except when participants appeared to consciously opt to articulate this variant traditionally taught in schools as the acceptable prescriptive pronunciation for educated individuals.

Of particular interest for linguistic research are regions where the indigenous languages of the native Andean inhabitants may have influenced the evolution of Spanish at various levels. The Andes mountain range, home of the Inca civilization, runs through the center of Peru from north to south, making a natural geographic division between the Pacific coastal region to the west and the Amazonian region to the east. Such division impacts the linguistic features of Peruvian Spanish in native residents of these areas. Previous research (Benvenuto Murrieta, 1936; Caravedo, 1999; Escobar, 1978) has shown that throughout the 20<sup>th</sup> century, essentially three *yeísmo* patterns have broadly corresponded to three geographical regions: simple *yeísmo* with the palatal voiced fricative [j] in coastal areas (with exception of a small region in the south); [j]-[ʎ] distinction in the Andean region; and an affricate palatal articulation [dʒ] in the Amazonian region. This variation is salient to native Peruvians who can easily identify the place of origin of an individual based on how they articulate the palatals. However, Caravedo (2013) has found that a change in progress is occurring in the production patterns of the palatal that correlates with the massive migration movements from Andean and Amazonian regions to the capital city of Lima. A total of 52 individuals, of whom 30 were originally from the Andean region and 22 from the Amazonian region, participated in the sociolinguistic study. All participants from the Andean region had low educational levels and were currently employed in agriculture, manual labor, or service labor. To control for the independent variable of bilingualism, some of the participants were bilingual in Spanish and Quechua, the language of the Inca Empire, while others were monolingual Spanish speakers. Results for the Andean region participants in both spontaneous

conversations and readings of text show that, while both bilingual Spanish-Quechua and monolingual Spanish speakers favor *yeísmo*, it is the monolingual group that tends to retain the distinction more than the bilinguals, suggesting that the influence of Quechua, which possesses the lateral phoneme in its inventory (Lapesa & Pidal, 1981), may not be a contributing factor in the retention of the distinction. For more formal modalities of speech such as the reading of a text, alternation between *yeísmo* and distinction was detected, with [ʎ] occurring mainly after /l/ in what seemed to be a process of assimilation. In a metalinguistic interview with 6 highly educated female school teachers regarding the /j/-/ʎ/ distinction, unanimous agreement was reported regarding the strong stigma attached to this distinction, in spite of the fact that they admitted occasional use and described it as correct when referring to orthographic differentiation. Their hesitation and self-correction during the reading portion of the interview when faced with orthographic <ll> supported an underlying judgment of an element of prestige associated with articulating <ll> as [ʎ]. The Amazonian region presented a version of *yeísmo* in which the variants found correspond to a range that goes from the approximant semi-consonant to the most constricted affricate variant: [j] > [j̞] > [ʒ] > [dʒ]. The participants were selected from two educational background and occupation extremes. Results show that for orthographic <y> participants unanimously produce the voiced palatal fricative [j] while there is alternation between [j] and the postalveolar and affricate variants [ʒ]/[dʒ] in the articulation of <ll>. Participants with low educational levels favor the affricate variant, associated with the stigmatized Amazonian dialect, while more educated participants favor the variant that carries more prestige, that is [j]. The loss of distinction is evident in both Andean and

Amazonian regions as seen by the fact that forms of *yeísmo* dominate the linguistic profile in these areas. First-generation migrant groups show significant loss of distinction, with second generation migrants displaying complete assimilation to the prestige standards of the capital (Caravedo, 2013).

### 2.1.3 Argentina: Buenos Aires

Argentina has been the object of many linguistic research efforts. Lipski (1994) recognizes that a variety of regional dialects exists throughout the territory, although interest for in depth research in regions outside of the capital city of Buenos Aires (Figure 6) seem to have fallen under the shadow of the more prestigious *porteño* ‘from the port’ dialect of the capital.



Figure 6. Buenos Aires, the capital of Argentina, on the Río de la Plata estuary (Google Maps).

The bulk of the sociolinguistic research specifically on *yeísmo* has focused on the strengthening and assibilation of the phoneme /j/ articulated as [ʒ], a process known as *yeísmo rehilado* or *zeísmo*. Some authors describe this phenomenon as having originated in Buenos Aires at the end of the 18<sup>th</sup> century and extended to other

parts of the territory as the prestige national variant (Fontanella de Weinberg, 1973,1994, 1995; Lipski, 1994). Other authors, based on analysis of written documents, claim that *zeísmo* in Buenos Aires can be traced back to the 17<sup>th</sup> century (Guitarte, 1992). Based on Guitarte's analysis of these documents, it is apparent that the innovative strengthened articulation was considered less than desirable by two notable 19<sup>th</sup> century men in the southern hemisphere who made substantial contributions to the culture and education systems of Latin America: Domingo F. Sarmiento, an intellectual writer and the seventh president of Argentina; and Andrés Bello, a political and literary personality (Leonard, 1954). Their writings have been foundational for teacher training in Latin America, particularly in the Southern Cone (Argentina, Chile, and Uruguay). In his writings, Bello specifically addresses the linguistic changes taking place in the population, which he describes as *un vulgarismo*, *un vicio de dicción*, and *un defecto de pronunciación* 'a vulgarism, a diction vice, a defect in pronunciation' (Guitarte, 1992, p. 557). Sarmiento stated that the articulation [ʎ] should be taught in schools as the prestige norm of Spanish pronunciation for orthographic <ll>, although at the same time he recognized that once a linguistic feature is used by the population at large, it can no longer be labeled as a vice, but rather as a valid linguistic transformation (Sarmiento, 1887). Guitarte's assessment of the social function of *yeísmo* in Buenos Aires during the 17<sup>th</sup>-19<sup>th</sup> centuries is threefold: 1) true *yeísmo* [j] corresponding to socially acceptable everyday speech, 2) an innovative, vulgar strengthened voiced variant [ʒ] described as a defect to avoid in careful, educated speech, and 3) the traditional distinction between [j] and [ʎ] taught in schools as the embodiment of Castillian prestige and encouraged in formal registers.

By the mid-20<sup>th</sup> century, the standard pattern of pronunciation in Buenos Aires had made the complete switch from [j] to [ʒ] (Honsa, 1965), and a novel evolution toward a devoiced variant [ʃ] had become the new focus of attention for research. The evolution of [ʒ] into the voiceless [ʃ], a process known as *sheísmo*, has captured the attention of and been followed by researchers since its inception, expansion, and subsequent completion in the late 1900s (Alonso, 1951; Chang, 2008; Colantoni & Rodríguez Louro, 2013; Fontanella de Weinberg, 1978, 1979, 1989, 1992a; Guitarte, 1955; Honsa, 1965; Lang-Rigal, 2015b; Rohena-Madrado, 2015; Zamora Vicente, 1949). In the decade of the 1940s, the strengthening of [j] into the prepalatal [ʒ] seems to have been the prestige norm in Buenos Aires among the educated, upper class population. Inspired by discrepancies in data about *yeísmo* in Buenos Aires from other contemporary researchers, Guitarte conducted an impressionistic study over the course of four months (Guitarte, 1955). After interviewing 150 people from different neighborhoods, he grouped them into three categories based on the analysis of the data gathered: the first group included 77 speakers who were identified as having the signature Buenos Aires pronunciation at the time, i.e. the voiced variant [ʒ], although he describes the sonority of this variant as weak and accompanied by a voiceless variant in 20-30 percent of the speech of these speakers. The second group was comprised of 23 individuals who produced the voiceless variant [ʃ], and a third group with 50 speakers showed free variation between the two variants. Regarding the devoicing of [ʒ], which Guitarte refers to as a phonological mutation, he concludes that this great devoicing process was in its initial stages and anticipates a difficult if not impossible stop to its advancement and full completion. Furthermore, he compares

it to the complex process of devoicing that Old Spanish sibilants followed throughout several centuries (Penny, 2002).

A few years prior to Guitarte's study, Zamora Vicente (1949) had also identified three groups among Buenos Aires speakers, albeit slightly different from those identified by Guitarte: one group that pronounced the prepalatal, voiced [ʒ], with a soft "buzzing" sound, as well as a more constricted variant with affricate features [dʒ] considered the typical pronunciation in Buenos Aires at the time, and associated with the educated population; a second group that devoiced the palatal, and according to Zamora Vicente was the most numerous and belonged to the middle class and the outskirt areas of the city. The author described the strengthened articulation as a harassment to the Castillian ear, as it originated in and spread from lower class neighborhoods. The third group of speakers "anarchically" alternated between the two variants. Zamora Vicente further noted that the voiceless variant, which he also associated with an informal or not careful style of conversation, was rapidly spreading and "cornering" the typical voiced pronunciation (Zamora Vicente, 1949, pp. 5–22). A third investigator offered a slightly different view of the phenomenon of devoicing at this time. Alonso (1951) asserted that, while the voiceless variant was mostly used for emphatic purposes in all of the Argentine littoral and in Uruguay, the widely used articulation of the prepalatal was the voiced one. He disagreed with the statement that devoicing was a widely spread phenomenon; rather, for him it was a rare and occasional divergence from the norm. What is more, he claimed that the innovative variant was not completely voiceless. Although he admitted that changes had happened since the 1930s, they were not as widely spread as Zamora described it and

he minimized other researchers' predictions of rapid spread and even completion of the process of devoicing in the future. The unfavorable lexical choices of these researchers to refer to the phenomenon of devoicing in its initial stages suggests their general sense of disapproval toward the innovative variant. A highly impactful political event in Argentine history in the 1940s may be part of the explanation for this attitude of disapproval. During the six-year presidency of Juan Domingo Perón (1946-1952), accompanied by her politically active wife, Eva Perón, masses of workers from the interior of the province flocked to the capital city to show support to the president, a strong advocate for labor workers. Honsa (1965) reports a rapid linguistic change, or linguistic mutation, between 1946-1949 originating among low class speakers, very possibly those coming from rural areas in the surrounding areas, who were referred to as *descamisados* 'shirtless' and *cabecitas negras* 'black heads.' This quick shift from the voiced to the devoiced palatal found its way into all social classes, as frequent political speeches by Perón and his wife were broadcast to address the workers, and as the upper classes strove to prove to the working classes that they "were not anti-social" (Honsa, 1965, p. 278). Honsa describes three social categories of mid 20<sup>th</sup> century Buenos Aires Spanish: standard, colloquial, and *lunfardo*, a slang variety that originated from the interaction of Spanish and Italian in the early 20<sup>th</sup> century and has greatly impacted Argentine Spanish at the lexical level. While *standard* Spanish referred to the variety with the traditional, prestige voiced prepalatal [ʒ], *colloquial* described the innovative devoiced prepalatal [ʃ]. In the following years, researchers observed that far from this variable being discrete, the common practice particularly among women and younger individuals seemed to be the stylistic alternation between

[ʒ] and [ʝ] (Guitarte, 1955). Toward the end of the last quarter of the 20<sup>th</sup> century, however, this once-pervasive and somewhat frowned-upon variant was reaching its completion and becoming the prestige norm among the younger generations of *porteños* ‘from the port.’

This variation in the particular case of *yeísmo*, far from being a linear, categorical process, presents a wide range of degrees of constriction in the pronunciation of the different allophones of /j/, as seen in impressionistic assessments by popular authors describing the characteristics of Spanish in Argentina (Bao & Greensfelder, 2002; Dilks, 2004; Luongo et al., 2007; Tozer, 2001). Recent sociolinguistic research has provided evidence that points at correlations between pronunciation patterns and social factors. Fontanella de Weinberg (1978, 1992b) pioneered quantitative sociolinguistic studies to explore the distribution of the variation between the voiced and voiceless variants in Buenos Aires speakers. In a study of 60 individuals from one neighborhood, she found that the choice of articulation correlated significantly with the sex and age of the participants (Fontanella de Weinberg, 1978). The devoiced variant dominated primarily in the speech of young females (15-30 years old) followed by females in the next age group (31-50), and by middle aged men (31-50). Participants 51-70 years of age showed meager signs of devoicing. Fontanella de Weinberg concluded that, while voiced, devoiced, and completely voiceless variants coexist, the devoicing process appears to have begun among the younger generation, in particular among women. The lead of women and the younger generations was supported by results yielded in studies by Wolf and Jiménez (1979) and Wolf (1984), who also report devoiced affricate variants of [ʒ].

The spread and completion of the process of devoicing in Buenos Aires was investigated by Chang (2008) in a study that took into consideration the participants' sex, age, and neighborhood of residence as a proxy for social class. In agreement with Fontanella de Weinberg (1992b), at least six different variants corresponding to voiced, devoiced, and completely voiceless articulations were found in the speech of the eleven participants in this study: [ʃ], [ʒ], [dʒ], [j], [j̥], and [ʎ]. The age-graded nature of the variety found among speakers aligns with Honsa's (1965) assessment regarding the approximate time when devoicing begun in the capital, i.e. the 1940s. The fact that the younger participants in this study, men and women, are close to 100% devoicing, is interpreted by Chang as being indicative of a change that has been completed rather than still in progress. Gender and neighborhood of residence did not yield significant differences in the statistical analysis, although the small number of participants is recognized by Chang as a limitation to be addressed in future studies.

Rohena-Madrado's (2008, 2013, 2015) studies found neighborhood of residence, used as an index of social class, to be a significant factor affecting the articulation of the palatal, with older middle-class speakers leading in percentage of devoicing and the low and upper classes lagging behind, a pattern associated with changes from below (Labov et al., 1972; Labov, 2001). However, no difference in articulation based on class was found among the younger generations, a strong indicator of a change nearing its final stages (Rohena-Madrado, 2008). In a novel approach to assess this completion, Rohena-Madrado (2013, 2015) compared the voicing of [ʃ] to that of the sibilant [s] in intervocalic position, hypothesizing that if no significant differences could be found, it could be concluded that the postalveolar

production of the devoiced palatal is indeed [ç] and the individuals who produce the sound are true devoicers. In this study, the interaction between age and class was found significant. While a high percentage of young, middle class speakers appeared to be full devoicers, this pattern was not reflected in younger speakers in the upper class, who showed higher rates of voicing similar to the speech patterns of the older, middle class speakers, suggesting that the voiced variant could still maintain residual prestige appraisal. These results were in agreement with Wolf (1984) who had earlier reported that upper class speakers expressed a negative assessment toward the innovative voiceless variant. Building on results from his 2013 study, Rohena-Madrado (2015) sought to investigate in more detail the completion of devoicing in Buenos Aires focusing on the demographic variables of age and social class as independent measures, the latter related to neighborhood of residence. Phonological context of the dependent variable was included to complement the comparison of percentage of voicing between [ç] and [s], and both inter- and intra-speaker variation was the aim of the investigation. As studies by Wolf (1984) and Rohena-Madrado (2013) suggested regarding the middle-class younger generation's preference for devoicing, the new research effort showed a significant decline in voicing among young upper-class participants, indicating further progress of the process of devoicing in Buenos Aires. This led the author to conclude, as others had previously noted (Guitarte, 1992), that the process of devoicing in the palatal had followed a very similar pattern as that of the devoicing of voiced fricatives in Medieval Spanish, thus prognosticating a reduction in the inventory of Spanish fricatives for Buenos Aires Spanish (i.e. /f, s, ç, x/) within the span of one or two future generations. The

identification of the affricate variant [dʒ] in 6% of the analyzed tokens of [ʒ] in phrase-initial position is posited by the author as meriting further research.

### 2.1.5 Argentina: The Interior Provinces

A high percentage of the population of Argentina concentrates in the central and northern regions of the national territory, with only 5% corresponding to the portion known as Patagonia, which includes the southern area of the province of Buenos Aires and the provinces of La Pampa, Neuquén, Río Negro, Chubut, and Santa Cruz (Figure 7). The absence of linguistic research in areas with low population density reflects such demographic peculiarity, with the bulk of the work focused predominantly on the capital and at a lesser degree in metropolitan areas of the interior.



Figure 7. Provinces of Argentina ([www.mapas-del-mundo.net](http://www.mapas-del-mundo.net)).

As a general rule, when referring to linguistic features found in Buenos Aires, many sources refer to such features as “standard Argentinian Spanish,” thus

disregarding, or at least underestimating, the fact that other variants are found in regions outside of the national capital. The widespread assumption is that “in Argentinian, obstruent realizations are *obligatory* ... only obstruent allophones are found: [zo] and [ʃo]” (Hualde, 2005, p. 166). However, this is not entirely accurate, as the variant [j] can also be widely heard in the speech of local cordobeses and other Argentine varieties (Colantoni, 2006b; Lang-Rigal, 2015b). Given the gradient nature in the production of this segment, it becomes necessary to investigate the current state of the variants in regions outside of Buenos Aires, where linguistic changes do not happen with the same strength or at the same rate as they do in the prestigious speech of the capital, a region more constantly and readily influenced by external forces.

The linguistic features of provinces other than Buenos Aires and its immediate surroundings have been generously addressed within the field of dialectology, and as such provide an impressionistic panoramic view of peculiarities that identify geographically delimited dialects. Such is the case of documented speech patterns in the provinces of San Luis (Vidal de Battini, 1949), Catamarca (País, 1980), Córdoba (Catinelli, 1985), Jujuy (Bedía, 1989), Misiones (Amable, 1975), Rosario de Santa Fe (Donni de Mirande, 1968), and San Juan (Sanou de los Ríos, 1989). Few research efforts have delved into acoustic analyses to explore the social and linguistic factors that govern variation and change. Palatal variation including laboratory acoustic analysis has been addressed for the provinces of Catamarca (Coronel, 1995; Abadía de Quant, 2000); Corrientes, San Luis, Córdoba, San Juan, and Entre Ríos (Colantoni, 2001); and Chaco (Polisena, 2019), the latter conducted with one 83-year-old male participant.

Sociolinguistic studies focusing on *yeísmo* and its variants in other regions of Argentina have had as their main objective the tracking of the expansion of devoicing (i.e., [ʒ]>[ʃ]), in areas outside of the national capital. These include Colantoni's (2006b) acoustic exploration of the assibilation of the fricative palatal and the rhotics in the province of San Juan as compared to the provinces of Corrientes, Misiones, and Entre Ríos, the latter three belonging to the littoral region in closer proximity to the capital. Colantoni's study included 8 male participants between 22-55 years of age without secondary education and longtime residents of the aforementioned regions. Results of the acoustic analyses that included voicing, frication noise, peak amplitude, and duration, suggest that San Juan shows a more conservative, non-assibilated voiced variant [ʒ] as opposed to the more assibilated ones in the other provinces closer to Buenos Aires. Furthermore, these results are in agreement with results for studies on other conservative varieties, which show a tendency toward an articulation of the voiced palatal closer to an approximant rather than a fricative (Lang-Rigal, 2015b). The gradient nature of this type of production is referred to by Colantoni as *micro* variation in that it happens outside of the speakers' awareness. The tendency of more innovative varieties toward the devoiced variant, however, captures the conscious attention of speakers and as such is classified as *macro* variation.

Regional variation in the devoicing of [ʒ] has been further explored in the provinces of Córdoba and Tucumán (Lang-Rigal, 2015b) and in Rosario, Tandil, and Córdoba (Castellani, 1998) in contrast with Buenos Aires, where the process of devoicing is said to have been completed (Chang, 2008; Rohena-Madrado, 2015). In agreement with Colantoni's findings revealing the spread of this phenomenon to other

provinces, the process of devoicing seems to be quickly gaining ground in Tucumán, and regions of the Littoral, whereas in Córdoba devoicing appears to be meeting stronger resistance (Lang-Rigal, 2015b).

### 2.1.6 Argentina: Córdoba

While previous sociolinguistic studies on *yeísmo* in Argentina have focused on the unique phenomenon of palatal strengthening and devoicing, sociolinguistic research on *yeísmo* focused exclusively on Córdoba, the second largest city in a pivotal central location (Figure 8), is notably lacking.



*Figure 8.* The city of Córdoba, capital of the province of Córdoba (Google Maps).

A modest number of impressionistic observations and studies broadly depict the general state of the phenomenon at different times in the past two centuries. Citing Carlos Melo’s essay titled “El siglo 17 y Córdoba,” Argentine historian Efraín Bischoff (1979) indicates that the alternation between *yeísmo* and *lleísmo* seems to have been the norm in 17<sup>th</sup> century Córdoba, with a stronger tendency toward true Castillian *yeísmo*, that is, the articulation of <ll> and <y> as [j] (p. 118). Prevedello’s (1991) impressionistic study on the contact between Córdoba Spanish and Italian in

the 19<sup>th</sup> century denotes that *yeísmo* evolved since the 17<sup>th</sup> century, placing the voiced fricative palatal [j] as the norm for the prestigious upper class while the approximant [ʎ] was associated with the lower classes. The assibilation of [j] into [ʒ] was occurring as well, although no social stigma seemed to accompany this new variant.

Documenting *yeísmo* in the mid 20<sup>th</sup> century, Vidal de Battini (1964) noted that the sonorant variant [j] continued to be the characteristic pronunciation in the province of Córdoba, placing particular emphasis on the speech of inhabitants of the interior of the province, an area that is much more rural in nature. Toward the end of the century, Supisiche (1994) and collaborators conducted a study with data collected between 1989 and 1994 which was aimed at describing the state of speech patterns in Córdoba capital during that time considering features in the morphosyntactic, lexical, and phonetic domains. The researcher and her team found that Spanish in Córdoba included both [j] and [ʒ], the former corresponding to what they call primary or Castillian *yeísmo*. No devoicing of [ʒ] to [ʃ] was documented whatsoever. The study divided the participants into three groups corresponding to high, mid, and low socioeducational levels based on the level of education completed. For the upper level, it was found that 61% of the participants pronounced /j/ as [ʒ], while 21% showed a tendency toward the palatal fricative [j]. The remaining 18% alternated between the two variants. In this group, none of the participants dropped the intervocalic [j]. Among those belonging to the middle-class group, 76% predominantly produced the prepalatal [ʒ] while 13% pronounced the palatal fricative [j] and 11% alternated between the two. As with the upper-class group, no dropping of intervocalic [j] was reported. The data from the lower-class group differed significantly from the other

two, where [ʒ] was absent. The author describes the production of these participants as corresponding 100% to the palatal [j] with 25% within this group showing elision of intervocalic [j] when preceded by tonic /e/ or /i/; for example, *cuchillo* ‘knife’ was pronounced as *cuchío*. Sex was not a significant factor in the analysis, and although age may have been a variable taken into consideration, it was not mentioned in the report of results.

In contrast with Vidal de Battini’s conclusions, Supisiche’s study provides evidence of the advancement of strengthening of [j] to [ʒ] with the former having shifted notably to characterize the lower class exclusively. Thus, [ʒ] had been adopted by middle and upper classes participants with the higher percentage in the middle class. This led the author to assume that at the time they were in the presence of a regression in the articulation of the voiced variant [j], which had diminished to less than 30% in the upper class and to 13% in the middle class. The strengthened pronunciation of the palatal was indicative of the tendency to replace [j] with the innovative strengthened variant [ʒ]. Based on this information, they proposed that the lower class might be the most conservative of the three as it maintained the feature that traditionally identified the region of Córdoba, according to descriptions provided in Vidal de Battini’s (1964) earlier study.

In a similar comparative study, Castellani (1998) explored the advancement of devoicing in Buenos Aires, Rosario, Tandil, and Córdoba, with similar results, i.e. Córdoba women had higher rates of voicing compared to the other three regions. A partially voiced variant is referred to as well, with high values among women in Córdoba and Buenos Aires.

Colantoni (2001) explored the processes affecting parallel changes in progress in two sounds that share similar articulation features: the assibilated palatals [ʒ]/[ʝ] and the assibilated rhotic [ř]. While one factor that is leading to assibilation was found to be of internal linguistic nature, contact with the prestigious capital dialect measured by distance from Buenos Aires was accounted for the presence of voiced and voiceless assibilated palatals in the provinces of Corrientes, Entre Ríos, Córdoba, San Luis, and San Juan. Those locations in the province of Córdoba located in the south and center of the province (Laboulaye, Villa María, and Córdoba city), showed larger rates of devoicing than did the city of Dean Funes located at the north of the province and thus geographically more distant to the capital than the other three (Figure 9).

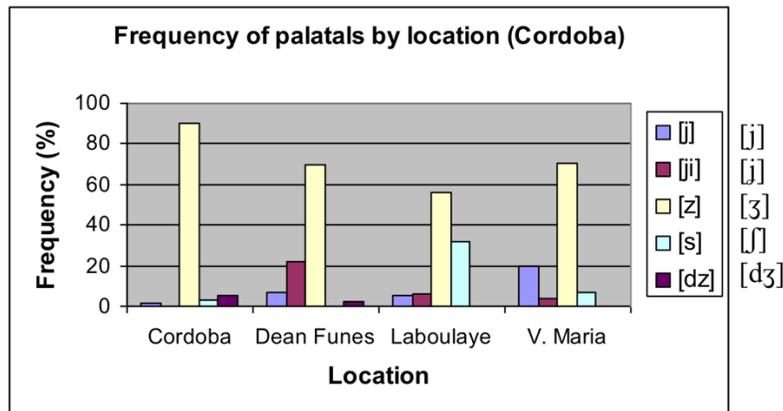


Figure 9. Palatal variants and their frequency of use in the province of Córdoba as reported by Colantoni (2001, p. 173).

Lang-Rigal's (2015) comparative study focused on the devoiced variant in Tucumán and Córdoba in contrast with Buenos Aires and included participants between 22-42 years of age from the three locations, balanced by region and sex, and all with a high educational level. Acoustic analysis for Córdoba participants yielded results that place the city in the category of conservative, while Tucumán displays

features corresponding to a more innovative variety mirroring linguistic patterns of the capital. This is consistent with findings from Colantoni (2001), where three of the littoral provinces appear to be following the lead of Buenos Aires while the one farther from the capital retains its voiced articulation. However, it should be noted that Córdoba is in closer proximity than Tucumán. In spite of this fact, while Tucumán is showing a progression toward devoicing in an expected pattern (women devoicing considerably more than men), Córdoba females consistently produced the voiced variants significantly more than females from the other two regions, while males showed a voicing rate comparable to that of Tucumán males, who are lagging behind women in the adoption of the devoiced variant. Additionally, comparable to Colantoni (2006b), the analysis of the difference in intensity (dB) between the voiced palatal and the following vowel provided evidence that points at a less constricted, more voiced production compared to the articulation of the counterpart in Tucumán (Figure 2.10). This finding led Lang-Rigal (2015b, p. 161) to suggest that Córdoba’s uniquely slow progress toward devoicing could mean that the city might possibly never progress toward full devoicing patterns.

Region	Log odds	Tokens (n)	Mean %
Buenos Aires	-21.824	121	46.242
Córdoba	20.947	126	88.927
Tucumán	0.876	159	67.655

*Figure 10.* Analysis of voicing percentage of [ʒ] in Córdoba (Lang-Rigal, 2015b, p.153).

To my knowledge, no in-depth sociolinguistic laboratory approach has been conducted focusing entirely on Córdoba with a significant number of participants representing a wider variety of socioeconomic levels and age groups to assess the current state of *yeísmo* and its social correlates in this central metropolitan region.

### **2.3 Articulatory and acoustic profiles of [ʎ], [j], [ɟ], [dʒ], [ʝ]**

The articulatory and acoustic characteristics of variants in *yeísmo* reflect processes of strengthening and assibilation with the consequent change in intensity of frication and a modification in point of articulation. Due to the particular focus of the present study, and in spite of early signs of devoicing that have been identified in Córdoba (Lang-Rigal, 2015b), a more intentional focus on the possible advancement of devoicing in Córdoba will be left for further investigation in the future. However, following Labov's (1966a) Principle of Accountability, it is necessary to circumscribe the variable context by taking into account all possible variants of the variable that could emerge in the data. Figure 11 shows such variants in the path that *yeísmo* in Argentina has followed, with [j] having undergone a process of increasing assibilation in which sibilant fricatives are progressively replacing non-assibilated palatals (Colantoni, 2006b).

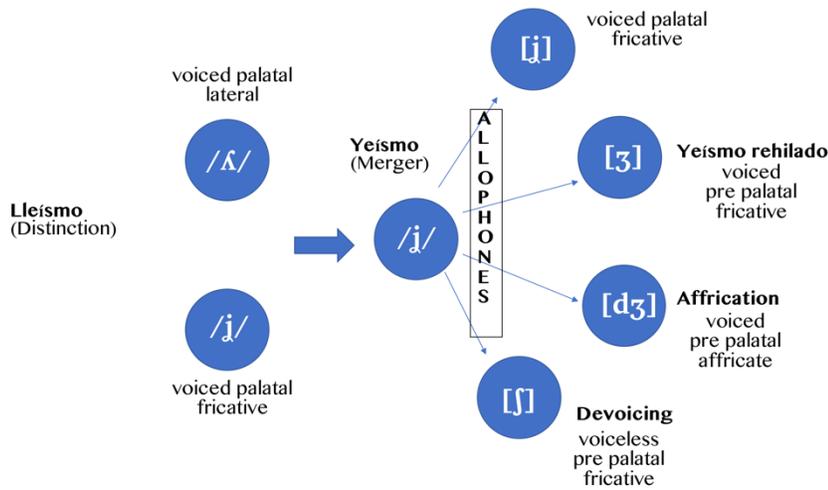


Figure 11. Path of yeísmo in Argentina from distinction to merger and the subsequent processes of assibilation and devoicing.

Such evolution has resulted in [ʒ] throughout the national territory and its latest devoicing in Buenos Aires into [ç] beginning in the mid-1940s and completed locally by the late 1990s (Chang, 2008; Rohena-Madrado, 2015). Although devoicing is finding its way in some provinces of the interior, Córdoba's historical conservative nature has shown stronger resistance to conform to the capital's norm and has largely maintained the voiced variant [ʒ] as a prestige norm, along with [j̞], a variant associated with the speech of inhabitants of rural areas or those with low levels of education. Nevertheless, instances of all variants are expected to be revealed in the data, as has been found in previous studies, even if in statistically non-significant results.

An overview of the allophonic inventory of *yeísmo* to which this dissertation will consistently refer is provided in Figure 12 with examples of English equivalents for the reader's convenience. While all variants share an articulation that involves

different areas of the palate as the inactive organ with which the tongue comes in contact, they present 5 different manners of articulation and variation in voicing rates. Following the notation in the International Phonetic Alphabet (IPA), throughout this study these allophones will be referred to as *palatal fricative* [j], *voiced<sup>3</sup> prepalatal<sup>4</sup> fricative* [ʒ], *voiceless prepalatal fricative* [ʃ], *palatal lateral* [ʎ], *palatal approximant* [j], and *prepalatal affricate* [dʒ]. Other intermediate variants will be addressed and elaborated upon as necessary.

Manner of articulation	Point of articulation			
	Palatal		Prepalatal	
	voiced	voiceless	voiced	voiceless
<b>Fricative</b>	j (allophone of /j/)		ʒ (pleas <u>u</u> re)	ʃ (sh <u>o</u> e)
<b>Lateral</b>	ʎ (N/A)			
<b>Approximant</b>	j (y <u>e</u> llow)			
<b>Affricate</b>	dʒ (j <u>u</u> st)			

Figure 12. Phonetic denomination of allophones of /j/ in Spanish described to their point and manner of articulation with examples of English equivalents where applicable.

### 2.3.1 Articulatory features

As shown in Figure 13, to articulate [j], the tongue dorsum rises toward the palate creating an elongated opening in the center of the oral cavity that allows the air to flow without producing turbulence. While some authors categorize [j] as fricative, the term approximant for [j] is favored by others given the fact that very little to no

<sup>3</sup> Reference to voicing is used only when it is the only feature that differentiates two allophones that otherwise share point and manner of articulation, such as [ʒ] and [ʃ].

<sup>4</sup> IPA notation designates [ʒ], [ʃ], and [dʒ] as *postalveolar*. Following Hualde (2005), this dissertation adopts the term *prepalatal* for these allophones.

friction actually occurs in its articulation (Hualde, 2010). For reference purposes, this segment corresponds roughly to an allophonic strengthened variation of the palatal glide or approximant /j/ of the grapheme <y> in English, in words such as *yellow*.

On the other hand, the articulation of [ʒ] occurs with the front of the tongue rising to create a narrow space between the blade of the tongue and the alveolar ridge while the sides of the tongue touch the palate and the upper teeth. This movement produces a second cavity under the tip of the tongue and behind the lower teeth resulting in a greater degree of frication when compared to [j]. The variant [ʒ] has resulted from a process of assibilation, and therefore strengthening, of [j], and corresponds to the sound of <s> in English words such as *pleasure*.

Featuring both occlusion and frication in its articulation, equivalent to the sound of <j> in *jam*, the variant [dʒ] is articulated with the tongue assuming an arched shape and elevating to make contact with a broad area of the hard palate extending upward from the upper molars. As for the articulation of [ʃ], the front part of the tongue is elevated to create a narrow and elongated opening between the blade of the tongue and the back of the alveolar ridge, while the palate and upper molars make contact with the sides of the tongue. The space left below the tip of the tongue and the blade forms a sublingual cavity behind the lower teeth, producing a sound that corresponds to the grapheme <sh> in English words such as *shoe* (Figure 2.13).

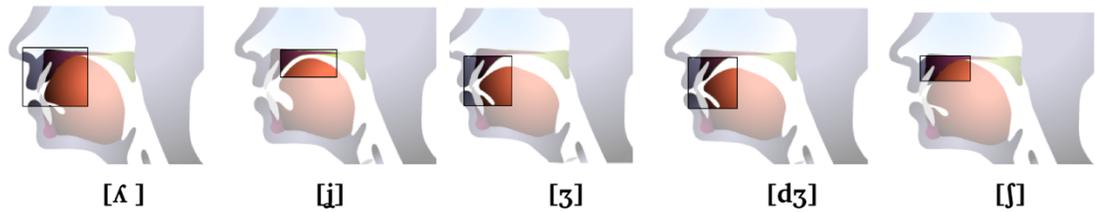


Figure 13. Different points of articulation and levels of frication in the variants of /k/ (far left) and /j/ (four other examples) in Córdoba (soundsofspeech.uiowa.edu, University of Iowa).

No equivalent for the lateral [k̟] is found in the English sound inventory, while in distinction-retaining Spanish varieties, it corresponds to the grapheme <ll>, and it is articulated with the air flowing on both sides of the tongue while it touches the palate in words such as *lluvia* ‘rain,’ *allá* ‘there,’ and *llama* ‘flame.’”

### 2.3.2 Acoustic features

Acoustic measures have been defined as “abstraction[s] that cannot be observed directly” (Gay et al., 2009, p. 600) and constitute an efficient tool to perform an objective analysis of what occurs in the vocal tract at the time when speech is produced (Gradoville, 2011). Moreover, an acoustic analysis of speech allows for the identification of both categorical and gradient variables, and renders a more easily replicable resource for future investigations (Eddington, 2011, p. 2). Previous studies of yeísmo have identified a number of acoustic features to distinguish the variants from one another that are considered relevant and promising for the purposes of the present study.

The devoicing process of [ç]>[ç̥] that has attracted the bulk of the attention for Argentine Spanish demands that acoustic measures be used to discriminate between

voiced and voiceless segments. To explore sound variation of palatals, Colantoni (2006b) resorted to measure periodicity (values of Cepstral Peak Amplitude closer to 0 indicate noise, while values closer to 1 indicate vowel-like segments), consonant-vowel intensity ratio (the smaller the ratio, the more vowel like the segment), voicing, and duration (Figure 14).

<b>Dimension</b>	<b>Approximant</b>	<b>Sibilant fricative</b>
<b>Voicing</b>	Voiced; some devoicing (Ohala 1993; 1997)	Voiced/voiceless (see Ohala 1993 for general aerodynamic principles; and Wolf & Jimenez 1979 for alternations in Buenos Aires Spanish)
<b>Frication noise</b>	Higher constriction in word-initial position (Borzone de Manrique 1976)	Buenos Aires Spanish: 3000-5000 Hz (Borzone de Manrique & Massone 1981); English (center of gravity): 4200-5300 (Jongman et al. 2000; Tabain 2001)
<b>Cepstral peak amplitude</b>	Not available	0.08 (Santagada & Gurlekian 1989)
<b>Intensity</b>	Absolute initial position: drop in intensity (Borzone de Manrique 1976). English: difference of -3.5 dB (Balakrishnan et al. 1996)	Spanish: change of 5-10dB (Gurlekian & Facal 1995). English (Balakrishnan et al. 1996; Jongman et al. 2000, respectively): [ʃ]: -13.7dB ; -9.9dB ; [ç]: -11.1dB; -8.3dB
<b>Duration</b>	16-38 ms; depending on speech rate and vowel context (Borzone de Manrique 1979)	Spanish (Borzone de Manrique & Massone 1981); [ʃ]: 170-210 ms; [ç]: 98-149ms; English (Jongman et al. 2000); [ʃ]: 178 ms; [ç]: 123 ms

*Figure 14.* Acoustic measures used in Colantoni (2006b, p. 92) to measure variation in the production of palatals in Argentina.

Assessing the completion of devoicing in Buenos Aires, Chang (2008) utilized a similar set of measures also exploring the average intensity of the palatal and the preceding and following vowels as well as duration, periodicity in the waveform, and the presence of a voicing bar in the spectrogram (Figure 2.15).

	% [ʃ] usage	Avg. % vcls.	Intensity(C/V <sub>1</sub> )	Intensity(C/V <sub>2</sub> )	
<i>Gender</i>	.030	.000	-.350	-.493	Spearman's <i>r</i>
	.931	1.000	.292	.123	<i>p</i> -value
<i>Barrio</i>	-.160	-.154	.474	.491	Spearman's <i>r</i>
	.639	.652	.141	.125	<i>p</i> -value
<i>Y.O.B.</i>	.960	.954	-.685	-.700	Pearson's <i>r</i>
	< .001	< .001	.020	.016	<i>p</i> -value

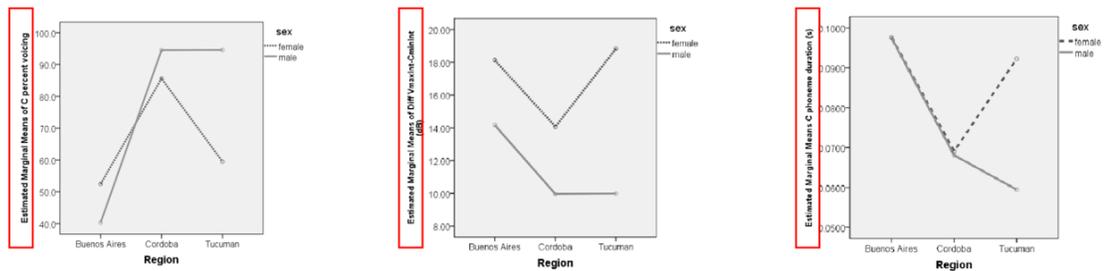
Figure 15. Acoustic measures used in Chang (2008, p.60) to explore the completion of devoicing in Argentina.

In a novel approach to assess the completion of devoicing in Buenos Aires, Rohena Madrazo (2015) opted to compare the percentage of voicing of allophones of [ʒ] to that of [s] by analyzing fundamental frequency values using Praat (Boersna & Wienick), posing that if the values approximated each other, the completion of the change could be assumed to have been completed or be near to full completion (Figure 16).

Response	Predictor	$\beta$	SE	<i>t</i> -value	<i>p</i> <sub>MCMC</sub>
% of voicing	(Intercept)	.235			
	Fricative	-.109	.030	-3.688	<.001
	Style	.077	.027	2.785	.005
	Position	.210	.021	10.228	<.001
	Class	-.027	.117	-0.234	.896
	Age	-.115	.117	-0.988	.323
	Fricative:Style	-.015	.024	-0.618	.536
	Fricative:Position	.145	.027	5.360	<.001
	Style:Position	.037	.028	1.298	.194
	Fricative:Class	.175	.032	5.451	<.001
	Fricative:Age	.329	.033	10.099	<.001
	Clase:Age	.043	.165	0.258	.796
	Fricative:Class:Age	.048	.046	1.029	.303

Figure 16. Acoustic measures used in Rohena-Madrazo (2015, p.303) comparing the features of devoiced variants to those of [s].

Expanding on Rohena-Madrazo’s approach, Lang-Rigal (2015b) successfully used percentage of voicing in her research on the regional variation of devoicing in Argentina (Figure 17), with the addition of duration and intensity to more precisely account for voicing in a gradient scale in three different regions: Córdoba, Buenos Aires, and Tucumán.



*Figure 17.* Acoustic measures used in Lang-Rigal (2015b) exploring regional variation of devoicing in three different regions of Argentina: (from left to right) percentage of voicing, intensity, and duration.

Zero crossings and center of gravity have also shown promise in the analysis of palatals (Fernandez Trinidad, 2010; Gradoville, 2011). Both measures have proved useful to deliver information on voicing: periodic voiced sounds have fewer zero crossings and a lower center of gravity than aperiodic, less voiced ones. In recent studies exploring the linguistic accommodation of Argentines residing in Malaga, Spain (Figure 18), Von Essen (2016, 2020) applied both measures in addition to duration and relative intensity, to efficiently discriminate among four allophones of /ʒ/: [j], [j̥], [ʒ], [ʒ̥].

von Essen (2016)										von Essen (2020)								
	[j]		[j]		[ɜ]		[ʃ]		ANOVA	Eta <sup>2</sup>		[j] (open)	[j] (fricative)	[ɜ]	[ʃ]	Total	Sig.	Eta <sup>2</sup>
Cx0/30	Media 31,04	Desv. 20,1	Media 41,89	Desv. 54,8	Media 51,66	Desv. 38,3	Media 142,66	Desv. 76,1	< 0,0 01	47,6	N	578	114	137	347	1176		
Cx0/10	10,18	5,1	15,81	13,1	19,65	13,6	61,75	22,1	< 0,0 01	69,2	% of the sample	49.1	9.7	11.7	29.5			
Cx0/INTERV ALO <sup>1</sup>	74,61	53,3	134,77	111,1	155,45	118,8	680,34	354,0	< 0,0 01	61,3	Dur. ms. (mean)	57.8	64.6	76.4	94.2	71.3	0.000	0.49
DURAC	71,72	24,4	87,35	30,4	77,45	18,6	108,28	32,9	< 0,0 01	25,4	Dur. ms. (SD)	14.3	17.1	14.0	19.7			
Co G	-	-	3351	1206,5	3508,3	1052,3 5	4274,6 6	1046,3	< 0,0 01	25,5	Dur. ms. (min.)	29	17	51	38			
											Dur. ms. (max.)	162	129	124	201			
BARRA SON .	Sí		Sí		Sí		No				ZCR (mean)	9.3	13.0	24.3	51.4	23.8	0.000	0.74
PULSOS GLO .	Sí		Sí		Sí		No				ZCR (SD)	3.0	7.1	12.3	17.7			
APERIOD .	No		No		Muy poca		Sí				ZCR (min.)	3.1	4.8	4.9	18.9			
PERIOD .	Sí		Sí		Sí		No				ZCR (max.)	19.8	35.7	70.5	108.1			
											Rint (mean)	3.7	5.3	9.1	12.2	7.0	0.000	0.56
											Rint (SD)	2.9	3.5	3.3	3.5			
											Rint (min.)	-5.5	-2.5	-1.0	2.5			
											Rint (max.)	12.5	14.5	17.5	21.5			

Figure 18. Acoustic measures used in Von Essen (2016, p. 28; 2020, p. 17) for the analysis of speech accommodation of Argentines residing in Malaga, Spain.

A summary of these acoustic measures successfully used in previous studies is presented in Table 2.3 below.

**Table 2**

*Summary of Acoustic Measures Successfully Used in Previous Studies of Yeísmo*

Previous studies	Measures
Colantoni (2006b) Assibilation of palatals/Argentine Spanish [j]>[ɜ]	Cepstral Peak Amplitude, voicing, CV intensity ratio, center of gravity
Chang (2008) [ɜ]>[ʃ] devoicing in Buenos Aires	CVintensity/voicing bar
Gradoville (2011) Fricative voicing	Pulse based, intensity based, harmonicity, ratios with adjacent vowel
Rohena-Madrado (2015) [ɜ]>[ʃ] devoicing in Buenos Aires	% Voicing in fundamental frequency
Lang-Rigal (2015b) Regional devoicing in Argentina	% Voicing in fundamental frequency, duration, intensity

**Table 2, Continued**

Scarpace et al. (2015) Variation in Peninsular [j] allophones	Intensity Difference
Rost Bagudanch (2017, 2018) Yeísmo in Peninsular Spanish	Duration, formant frequency
Von Essen (2016, 2020) Accommodation of Buenos Aires immigrants to Málaga Spanish [f] > [j]	Zero crossings, duration, center of gravity, relative intensity

The above acoustic measures, having proved valid and reliable, will be taken into consideration in the present study. However, because *yeísmo* in Córdoba remains in a stage that displays primarily fricative, voiced segments that also share a similar place of articulation (palatal/prepalatal), it was decided that the discrimination between these variants would be further explored through a replicable segmental analysis consisting of the visual inspection of each token to identify their acoustic features through the waveform and spectrogram in Praat. This process is addressed and elaborated upon in Chapter 4.

## CHAPTER 3

### THE SPEECH COMMUNITY

The unique historical background of Córdoba and the resulting demographic composition of the city make it an ideal target to conduct experimental sociolinguistic research exploring regional manifestations of *yeísmo*. As a native of Córdoba, I was situated in an advantageous position given my insider's knowledge of the community that facilitated the design and implementation of the research. The following sections provide an overview of the characteristics of Córdoba Capital from its historical origins to its current demographic landscape, placing emphasis on socioeconomic aspects relevant to this research.

#### 3.1 Geography

The province of Córdoba is centrally situated in the heart of Argentina (Figure 19) and maintains close connections with the national capital through main roads and the media (television shows, radio, the Internet, social networks, etc.). Córdoba Capital attracts a large number of tourists due to its close proximity to the mountainous region known as *Sierras de Córdoba* situated only 19 miles (30 km.) west of the capital city. Countless picturesque towns, rivers, and lakes in this mountainous region receive a continuous flow of visitors to their year-round festivals and outdoor leisure activities.

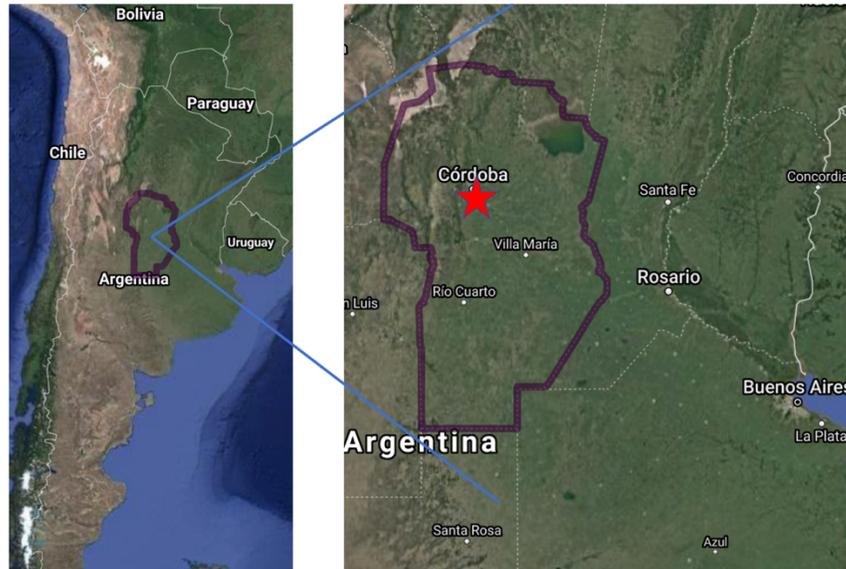


Figure 19. The centrally located province of Córdoba and its capital, the city of Córdoba ([www.cba.gov.ar/provincia/mapas/](http://www.cba.gov.ar/provincia/mapas/)).

### 3.2 History

Founded in 1573 by Spaniard Jerónimo Luis de Cabrera, the city of Córdoba de la Nueva Andalucía has a long and closely intertwined scholastic and religious tradition. Efraín Bischoff, a prominent Argentine historian, stated that *“La religión fue, desde el comienzo de la ciudad, uno de sus guiones hacia el porvenir”* ‘religion was, from the very beginning of the city, one of its stepping stones to the future’ (my translation) (Bischoff, 1979, p. 76).

#### 3.2.1 Education

Spanish Jesuit priests arrived in Córdoba in the late 16<sup>th</sup> century soon after its founding with the main purpose of ensuring that the religious tradition and educational standards of Spain were transmitted to the children of the conquistadores. Their evangelistic efforts left their mark on the population, who assimilated their indoctrination and have maintained it through the centuries. The numerous church

buildings the Jesuits built in the city have been carefully preserved and are at the heart of the touristic circuit in downtown Córdoba. The prestigious schools the Jesuits founded and directed remain open and functional to this day (Bischoff, 1979). The Universidad Nacional de Córdoba was the first institution of higher education founded in Argentina in 1613 and the fourth in Latin America. Its origins as an institution of high intellectual level attracts students from all over the country as well as international students of diverse origins. As a result of the efforts of early Jesuit priests, Córdoba soon earned the titles of “*Córdoba de las Campanas*” ‘Córdoba of the Bells’ and “*Córdoba, la Docta*” ‘Córdoba the Learned’ and is known for its strong focus on all disciplines within the arts and the sciences. Due to conflicts between the Jesuit order and the Spanish monarchs in the mid 1700s, the priests who had been sent to Argentina were expelled from the country; however, their impact on the city remains to this day reflected in the strong Catholic feel of the city and its strong emphasis on education.

### **3.2.2 Early inhabitants and social differentiation**

Prior to the arrival of the Spanish conquistadores, two of the main autochthonous inhabitants in the central region of the country were the *sanavirones* and *comechingones* indians. Living a nonmigratory and rather peaceful lifestyle, these indigenous tribes were primarily devoted to agriculture. Numerous paintings on cave walls distributed throughout the province attest to the way of life of these early inhabitants. Aware of their disadvantaged position as a defeated race, they offered no resistance to the authority of the Spanish newcomers (Bischoff, 1979). Plagued by diseases new to the American continent that were brought from overseas, the

indigenous population soon diminished drastically, leaving the conquistadores with an alarming shortage of labor work for their haciendas. This situation, coupled with the early 16<sup>th</sup> century “Law of the Indies” ‘*Leyes de Indias*’ to regulate the interactions between settlers and natives protecting the latter against abuse, made it necessary to bring labor force resources from outside of the country. Córdoba soon became a center of African slave trade to satisfy this need (Bischoff, 1979, pp. 69-70). *Mestizos* born of the mix of Spaniards and indigenous men and women, and *Morenos* born of the mix between mestizos and African slaves faced constant discrimination from the upper White class of European origin.

Social class distinctions were established very early on. The descendants of Spanish conquistadores clearly and proudly delineated the boundaries of the upper class, independently of whether or not their peninsular ancestry was associated with the nobility (Bischoff, 1979). They were the privileged citizens with open and easy access to education in the prestigious schools, and their ornate houses and quality clothing reflected their position in society.

Access to the schools founded by Jesuits provided quality academic education and indoctrination in the Catholic faith, both strong social markers of the well-to-do, educated, and cultured citizens. The main concern during these early times, however, was to educate the Spaniards’ male offspring while females were relegated to their domestic role in the home and considered to have no need for an education beyond that environment. Such mindset shifted in the early 17<sup>th</sup> century when new institutions were founded in which both males and females were welcome (Bischoff, 1979).

Moreover, Bishop fray José Antonio de San Alberto, one of the strongest proponents

of education in the city, founded the Santa Teresa de Jesús school for girls, where both White and *Morenas* were admitted, although they were taught separately. San Alberto persistently insisted that educating all children was a necessary task to raise men and women who could be of service to both Church and Government (Bischoff, 1979). Extensive high-quality education for men and women became a cultural marker for the city of Córdoba since its early times.

### **3.2.3 Political presence**

Córdoba has been the home of a large number of intellectual personalities graduated from the Universidad Nacional de Córdoba who made an important political impact on post-colonial Argentina, including four national presidents and four vice presidents. Traditionally a conservative province strongly associated with the leading right-wing political party, Córdoba has historically been the main center of opposition to any form of government that threatens its long-established and valued standards of life, particularly related to education and working conditions. Two such events of national and international repercussions that originated in Córdoba are the University Reform of 1918 and *El Cordobazo* of 1969. Although at first glance these events were associated with education and politics respectively, historians agree that these events were in reality the result of complex social turmoil (Brennan & Gordillo, 1994; Tünnemann Bernheim, 2018).

The University Reform of 1918 originated as a reaction to the control that a small number of federal government officials from privileged classes had over decisions regarding higher education. Specifically, this movement demanded a reform to make education free and accessible to all in an environment of secular, democratic

autonomy where both professors and students could have equal voice. This movement drastically transformed the fate of national universities and eventually impacted the democratization of universities across Latin America (Tünnennann Bernheim, 2018).

Likewise, the military coup that overthrew democratic President Arturo Umberto Illias, a native of Córdoba, in 1966, spurred social unrest in the working class in Córdoba that until then had been growing and moving upward in the socioeconomic ladder. Limitations imposed by the new government ignited an uprising in response to “declining living standards and frustrated expectations of social mobility” (Brennan & Gordillo, 1994, p. 477). The new regime’s intentions to weaken the participation of the working classes in order to carry out its plan of economic modernization was frustrated in the city of Córdoba by masses of labor workers with the support and active participation of university students. Accustomed to the democratic freedoms gained after the University Reform of 1918, this group joined in the two-day violent strikes to support the claims of the workers and to protest against the removal of autonomy in university education. The climax of this unrest occurred on May 29-30, 1969 in what later came to be known as *El Cordobazo*, an anti-dictatorship movement described as a “complex social, political, and cultural phenomenon [with] ... true significance as a seminal political event in modern Argentine history” (Brennan & Gordillo, 1994, p. 478). The event was not without very serious consequences in the following decades, and it served to feed the historical antagonism between Córdoba and Buenos Aires. In spite of its adverse effects, *El Cordobazo* has become a symbol of the rebellious nature of the city of Córdoba and has inspired subsequent generations

to resist forces that present a threat to its social, political, economic, and educational identity.

### 3.3 Current demographics

#### 3.3.1 Population

According to the latest census data of 2010, the population of the province of Córdoba is 3.3 million inhabitants, of whom 1,329,604 reside in Córdoba Capital. At the time of the 2010 census, it was projected that the population would have grown to 1,430,000 by the year 2017 (Mestre, 2017).

Córdoba Capital has a higher percentage of females in the distribution within the 15-to-64-year-old range. Male children outnumber female children ages 0-14, while the reverse is seen in the older population ages 65 and older, where women outnumber men. The adult group (30-64 years old) is the largest sector of Córdoba Capital, representing 39.4% of the total population. Overall, the female population surpasses the male population by 5%, as seen in Figure 20.

Rango etario	Varón	Mujer	Total	%
Niños/ 0-14 años	158.730	154.453	313.183	23,6%
Jóvenes/ 15-29 años	175.693	180.473	356.166	26,8%
Adultos/ 30-64 años	247.729	276.274	524.003	39,4%
3ª edad/ 65 y más años	52.189	84.063	136.252	10,2%
<b>Total</b>	<b>634.341</b>	<b>695.263</b>	<b>1.329.604</b>	<b>100,0%</b>

*Fuente. Elaboración propia en base a los CNPHV 2010, Instituto Nacional de Estadísticas y Censos Instituto Nacional de Estadísticas y Censos (INDEC).*

Figure 20. Distribution of the population of Córdoba according to sex and age.

Regarding the ethnic composition of the population as a whole, the city of Córdoba Capital does not appear to have significant external influences. With 97.6%

of its population being native Argentines, other ethnicities correspond mainly to neighboring Latin American countries and account for only 2.4% percent of the population (Figure 21).

Lugar de nacimiento	Cantidad	%
Argentina	1.297.734	97,6%
Otros	31.870	2,40%
Latinoamérica	24.488	1,80%
Resto de América	1.263	0,10%
Europa	5.292	0,40%
Asia	707	0,10%
África y Oceanía	120	0,00%

*Fuente. Elaboración propia en base al CNPHV 2010, Instituto Nacional de Estadísticas y Censos (INDEC).*

Figure 21. Place of birth of inhabitants of the city of Córdoba.

### 3.3.2 Neighborhoods

The population in the capital is distributed among 502 neighborhoods in a total area of 576 square kilometers or 222 square miles (Mestre, 2017).

Delineating neighborhoods by social class is a complicated task in Córdoba, given the exponential growth of the city in the last few decades. There has been an emergence of new neighborhoods aimed at high socioeconomic levels within areas historically occupied by low-income families, most of whom have remained in that sector of the city. This heterogeneous demographic distribution of the city makes it difficult to group neighborhoods in predetermined social categories. As a common trend, the oldest and most traditional residential neighborhoods are located in the perimeter of the downtown area and mostly house the population belonging to the middle-upper class. Upper class neighborhoods tend to be spread out around the outskirts of the city where larger and higher priced lots are available. Low class

neighborhoods are also spread out throughout the city, both near and far away from the downtown area.

A demographic development that began in the early 1990s is the emergence and growing popularity of gated communities, referred to as *countries*, *barrios privados*, and *barrios cerrados*, depending on the level of security they afford their residents. In the province of Córdoba, a total of 200 gated communities have been documented, 29 of which can be found in Córdoba Capital. In a 2016 article published in Córdoba's main newspaper, journalist Virginia Guevara provides a clear picture of the demographic shift these neighborhoods caused: "*El surgimiento y la consolidación de los countries fue acompañado por la idea de que ahí vivía una elite poderosa y autosuficiente que decidió encerrarse en busca de status y homogeneidad, fijar sus propias normas y autosegregarse para vivir entre iguales.*" 'The emergence and consolidation of countries was accompanied by the idea that the residents belong to a powerful and self-sufficient elite who decided to lock themselves up searching for status and homogeneity, establishing their own norms, and self-segregating to live among equals' (my translation). (La Voz del Interior, 24 julio 2016). The appearance and immediate acceptance of this type of neighborhood by members of the upper classes caused a fragmentation of the main sectors of the capital, with a large number of high socioeconomic power families moving into these neighborhoods distributed around the city.

### **3.3.3 Social stratification**

Although social class is at the heart of studies of linguistic variation and change, defining the factors that make up social classes within a community has

proven to be a challenging task because linguists have not taken advantage of the information gathered by studies conducted in other disciplines such as sociology (Ash, 2013). The categorization of social class in the city of Córdoba presents complex challenges due to the high levels of mobility and disparity in the areas of occupation, income, and education levels. Although the upper-class status that passed on from generation to generation among the historically influential families in Córdoba still remains, the middle and lower classes are not as easily delimited and require a much more meticulous analysis to place into categories.

The complexity of this social situation was scientifically addressed in a 2014 study by Gutiérrez and Mansilla and sponsored by CONICET (*Consejo Nacional de Investigaciones Científicas y Técnicas*) in which they propose a categorization of four social classes based on the population's economic (income) and cultural (education) capital as informed by the *Encuesta Permanente de Hogares* in the years 2003 and 2011. The results accurately reflect the current social profile of Córdoba capital:

- 1) Dominated low class represented by 20% of the population: employment in the service industry such as cleaning and construction with a salary in the lowest percentile on a 1-10 scale. Primary school education incomplete or complete.

CLASE 1/4: CLASE BAJA DOMINADA (20%) Bajo volumen global de capital con una estructura patrimonial asociada a bajas calificaciones laborales, capital escolar de nivel primario e IPCF entre el 1° y 2° decil.

- 2) Dominated middle class represented by 35% of the population: employment in the service or operational industries with a salary in the 3-5 percentile on a 1-

10 scale. High school education incomplete.

CLASE 2/4: CLASE MEDIA DOMINADA (35%): Volumen y estructura patrimonial asociados a calificaciones laborales operativas, capital escolar medio incompleto e IPCF entre el 3° y 5° decil.

- 3) Dominant middle class represented by 29% of the population: employment in the technical labor industry, social and health services, or education, with a salary in the 7-9 percentile on a 1-10 scale. University level education incomplete.

CLASE 3/4: CLASE MEDIA DOMINANTE (29%): Alto volumen global de capital con una estructura patrimonial asociada a calificaciones laborales técnicas, capital escolar Superior Universitario e IPCF entre el 7° y 9° decil.

- 4) Dominant upper class represented by 17% of the population: Professional employment in business, education, administration, with a salary at the highest percentile on a 1-10 scale. University level education complete.

CLASE 4/4: CLASE ALTA DOMINANTE (17%). Alto volumen global de capital con una estructura patrimonial asociada a la propiedad de empresas o el control de la fuerza laboral, calificaciones laborales profesionales e Ingresos en el 10° decil

This hierarchical categorization is in agreement with sociological research findings that support a definition of class in connection to factors of economic dominance, prestige, reputation, and status (Ash, 2013).

### 3.3.4 Education

The literacy rate in Córdoba, according to the latest census, is 98.6% at provincial level. The education system consists of four levels corresponding to:

- 1) *Inicial*: Kindergarten for 5-year-olds.
- 2) *Educación Primaria*: 6-11 years old, 1<sup>st</sup> - 6<sup>th</sup> grade.

3) *Educación Secundaria*: 12-17 years old, 1<sup>st</sup> – 6<sup>th</sup> year, high school.

4) *Educación Superior*: 18+ years old, university.

A total of 428 educational institutions covering K-12 levels are distributed throughout the city and serve this age group that represents approximately 5% of the population, according to a 2018 report by the Ministerio de Educación de la Provincia de Córdoba. All levels of education are accessible to the population through public as well as private institutions.

With an average of 100,000 students, the Universidad Nacional de Córdoba (UNC) is at the center of the scholarly activity of the city. Currently, the city houses eight universities with an average enrollment of 153,000 students in 591 professional tracks at both the undergraduate and graduate levels (Guía Estadística de la Ciudad de Córdoba, 2014).

### **3.3.5 Local industry and economy**

Out of the eight institutions of higher education in the city, four offer programs for the learning of automobile mechanics and technology with a degree as Automobile Technician. Sixty percent of the economy of the city of Córdoba revolves around the manufacturing industry. Automobile manufacturing takes up the bulk of the industry, with 30% of the national production coming through manufacturers like Fiat, Renault, Iveco, Nissan, Volkswagen, Mercedes Benz, and Marco Polo. Córdoba provides cars not only locally but also nationally and internationally, exporting its products to Latin America, Europe, and Asia.

At provincial level, Córdoba is a massive producer of grains in the agricultural sector of the economy, providing 27% of the national production and 56% of the

regional production of central Argentina. Peanuts (91%), corn (34%), and soy (29%) are the main grains harvested and commercialized in the province and the nation and exported worldwide (Guía Estadística de la Ciudad de Córdoba, 2014).

### **3.4 Summary**

Córdoba's central location, population density, long standing tradition in education, and impact on national social, economic, political, and educational issues are aspects of Córdoba that come together to create a strong sense of identity in native *cordobeses*. This distinctive character is preserved and validated by change-resistant speech patterns as evidenced in previous research on the advancement of Buenos Aires *yeísmo* features in Córdoba (Colantoni, 2006b; Lang-Rigal, 2015b) that merit being studied as a local sociolinguistic phenomenon in its own right.

## CHAPTER 4

### METHODOLOGY

#### 4.1 Research questions

The present study seeks to analyze the palatal fricative /j/ and its variants in the speech of local *cordobeses* based on a variety of linguistic and extralinguistic factors. This is an apparent time study (Labov, 1994) in which all data was collected in the summer of 2019 with a range of participant ages in order to ascertain if there is currently a change in progress in Córdoba or perhaps it is a case of stable variation or age-grading (Hockett, 1950; Tagliamonte, 2012; Wagner, 2012).

Variants of /j/ constitute the dependent variables and correspond to alternative phonetic productions of the graphemes <y> and <ll> in words like *lluvia* ‘rain’ and *mayo* ‘May.’ One of the main tenets under which sociolinguistic studies of variation and change are conducted is that linguistic variation does not happen in isolation from the social contexts in which individuals function (Foulkes & Docherty, 2006).

Drawing from data collected during the sociolinguistic interviews, this work was guided by the following research questions based on descriptive and inferential statistics respectively:

**RQ1:** What is the overall frequency of [j], [ʝ], [dʒ], [ʝ], and [ʌ] in the speech community of Córdoba?

*Hypotheses RQ1:* Based on the researcher’s own experience as a native of the speech community under scrutiny, the formal ethnographic data collection during the summer of 2019, and findings from earlier research (Colantoni, 2001, 2006a, 2006b; Lang-Rigal, 2015b; Supisiche, 1994; Vidal de Battini, 1964), it is hypothesized that

Córdoba continues on a growing tendency to favor the strengthened voiced variant [ʒ] as the prestige variant over [j]. This trend has emerged in Supisiche's (1994) findings as compared to Vidal de Battini's (1964) results decades earlier and in research exploring voicing patterns in other Argentine provinces (Colantoni, 2006b; Lang-Rigal, 2015b). Based on Lang-Rigal's (2015b) findings on devoicing patterns in provinces outside of Buenos Aires, with Córdoba showing the lower rates of accommodation to devoicing, it is predicted that the voiceless variant [ʃ] will emerge in the data, mainly among women and participants in the younger group, as is the common pattern of possible changes in progress, although not in significant proportions to determine that this change is in an advanced stage. As for the frequency of [dʒ], the phonetic context of the tokens is predicted to have a significant impact on the frequency of occurrences, especially in, but not limited to, word initial contexts, after a pause, and after a nasal or lateral consonant, (Rost Bagudanch, 2017, 2018; Fernández Trinidad, 2010; Rohena-Madrazo, 2015; Scarpace et al., 2015). Finally, the lateral variant [ʎ] is expected to emerge in the data in low proportions and strictly associated with the prescriptive articulation of <ll> in the more formal styles.

It is further hypothesized that, as has been consistently found in previous research, men and women and members of different social levels will display differences in how often and to what extent they style-shift (Eckert, 2000). The addition of tasks in other stylistic contexts in which awareness to speech is raised constitutes a useful tool that examines whether or not speakers vary across styles in response to alterations in the surrounding context, perhaps shedding light into whether a variant is an indicator that correlates with social class, a marker associated with

social class and stylistic stratification, or an inconspicuous, stigmatized stereotype (Labov, 1972, 2001; Tagliamonte, 2012). Changes, or lack thereof, across styles can allow researchers to detect a *change in progress* or *stable variation* in a community (Sankoff, 2006), two foundational tenets of Labovian variationist sociolinguistics.

**RQ2:** What are the social and linguistic factors that govern the realization of [j], [ʒ], [dʒ], [ʃ], and [ʎ] for orthographic <y> and <ll> in Córdoba?

*Hypotheses RQ2:* It is postulated here that [ʒ] has reached a prestige status across gender and age boundaries. As such, the overall frequency of [ʒ] is expected to be greater than that found in previous studies. Consequently, the favoring of [j] will still be present but more restricted to low socioeconomic level individuals, with a negative correlation showing an increase in the production of [j] as the socioeconomic level decreases.

Based on the progression of variation and change patterns observed in the capital of Argentina, the author further anticipates that the production of [ʒ] among the younger generations and among the women might be showing early signs of devoicing mirroring the pattern detected in other provinces where the prestigious capital variant has been found to be spreading, although at dissimilar rates (Colantoni, 2006b; Lang-Rigal, 2015b). Age has consistently proved to be a significant variable when a linguistic change is undergoing rapid spread (Labov, 1963, 1966a; Bailey, 2002). However, this doesn't appear to be the case in Córdoba, and for this reason age is not expected to represent a significant factor in itself but rather in interaction with sex and social class. In conformity with evidence from previous sociolinguistic research, sex is expected to surface as one of the strongest predictors of variation (Labov, 1990,

2001), with women displaying greater preference toward the prestige form in both spontaneous and careful speech, and men lagging behind (Labov, 2001), especially those in the working-class population (Trudgill, 1972). Social class as determined by educational level, occupation, neighborhood of residence, and salary range is expected to emerge as another significant factor intersecting with sex and impacting variation in this study (Labov et al., 1972; Ash, 2013). Because both sex and social class have been found to converge and interact with style of speech (Labov, 1990; Tagliamonte, 2012) it is hypothesized here that men, especially those in lower socioeconomic classes, will show lesser degrees of variation across styles than women. Given the complexity of gender as a social construct, as opposed to the categorical differentiation between biological sex (male/female)<sup>5</sup>, it is expected that the analysis will unveil variation within the same gender as well, which in some cases it has proven more significant than variation between genders (Eckert, 1989).

Regarding the affricate [dʒ], as Hualde (2005, p. 166) accurately expresses, this variant appears to be associated with social prestige and as such enjoys widespread status in Argentina. Consequently, it is hypothesized that besides the linguistic contexts confirmed in previous studies to impact the articulation of the palatal fricative (i.e., word/phrase initial, after nasal or lateral) this variant could emerge in the data with significant frequency in connection with other factors as well,

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<sup>5</sup> The author recognizes the complexity of gender as a binary factor *male/female* as opposed to gender as a social construct (Eckert, 1989). Second and third wave approaches provide the possibility to explore variation and change related to emerging group and individual gender identities against the backdrop of equally valid large-scale categories such as biological sex differences (Schilling, 2013).

as found in Rohena-Madrazo (2015) where the vast majority of affricate incidents occurred among voicers [ʒ] as opposed to zero cases by devoicers [ʃ].

## 4.2 Participants

In Córdoba in the summer of 2019, the author first contacted potential participants in a variety of age ranges with whom she is linked through some type of social network (family, friends from school, friends from church, former colleagues, neighbors) to secure their commitment to participate in a recorded interview during the researcher's 7-week stay. A total of 70 participants were interviewed: 40 women and 30 men, ranging in age from 18 to 81 ( $M: 50, SD: 18.12$ ). Out of the 70 recordings, five were discarded due to excessive external noise that rendered the acoustic analysis unreliable. The total number of recordings analyzed for this study was 65. An overview of the independent demographic variables considered is given in Table 3 and expanded upon in section 4.5. Demographic information about each individual participant is provided in Appendix G.

**Table 3**

*Demographic Characteristics of Participants*

<b>Sex</b>	M (N = 28)	F (N = 37)	
<b>Age (categorical)</b>	18-30 (N = 17)	31-64 (N = 37)	65+ (N = 11)
<b>Age (continuous)</b>	18 – 78 (Birth 1941 – 2001)		
<b>Education level</b>	None/elementary school (N = 12)	High school (N = 25)	Higher education (college/specialization) (N = 28)
<b>Occupation*</b>	1 (N = 21)	2 (N = 19)	3 (N = 25)
<b>Salary</b>	0-10 K (N = 22)	10-30 K (N = 17)	30+ K (N = 26)

**Table 3, Continued**

<b>Neighborhood</b>	0-4.5 K/parcel (N = 17)	4.5-12 K /parcel (N =21)	12+K /parcel (N =27)
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**\*OCCUPATION**

1 = retired/student/unemployed/housemaker

2= Professionals / business owners/head of organizations/education/private sectors/

Technicians/health/administration/state employment/wage-earning employee/legal area

3 = Commerce, retail/industry/operator/ self-employed/construction/domestic service

The rented apartment where the author stayed was located in the neighborhood of her upbringing, which provided convenient access to relatives and acquaintances who still reside in the vicinity. The close proximity of this location to the downtown area and to a number of public transportation lines made it a suitable site for a number of interviewees who chose to meet in her apartment. The three main locations were the researcher's apartment, the participant's home, or the facilities of a nearby religious establishment with which the author has close ties. In order to fill the desired sample size, the author resorted to the snowball sampling technique (Milroy & Gordon, 2008) through the collaboration of participants in her own social networks who suggested potential participants and served as intermediaries to initiate contact.

**4.3 Data collection & procedures**

Data was collected through Sociolinguistic Interviews consisting of four parts described in detail below and distributed in the following order: Part A) a 20-45-minute semi-directed conversation with open ended questions related to personal experiences and opinions about life in Córdoba; Part B) a reading of a 300-word story; Part C) a reading of a list of words and minimal pairs; and Part D) a picture-naming task. While Part A was designed to elicit spontaneous speech, Parts C through D

account for speech of a more conscious type, in accordance with the approach to view variation and change under the influence of the amount of attention paid to speech (Labov, 1972).

#### **4.3.1 Part A: Semi-directed conversation**

The collection of spontaneous, vernacular data (Becker, 2013; Labov, 1972; Schreier et al., 2013) was performed through a conversation with each participant in a location and at a time of their convenience, in a room with little to no ambient noise, with a H4nPro recorder. Because some participants were accompanied by another family member who was also willing to participate, initially two microphones were used for convenience sampling with two participants in one time slot. Both microphones are of equivalent high recording quality for acoustic analysis: a Shure WH20 Dynamic Headset Microphone and a XLR Lavalier omnidirectional lapel microphone. However, this proved not to be comparable with individual recordings because participants would speak simultaneously overlapping each other's speech, or one participant would dominate the conversation, thus rendering this protocol inefficient to collect the desired number or quality of tokens needed for appropriate acoustic analysis. Only two pairs of participants were recorded under this strategy in the early stages of the data collection process before the author resorted to utilizing the same microphone with individuals as well as with dyads. In the latter case, each participant was given their own turn to respond to the questions. The microphone of choice for all participants except the ones mentioned above was the Shure WH20 Dynamic Headset Microphone. While the quality of both microphones is comparable,

the author deemed this microphone better suited to minimize sound interference due to the participants' natural arm and hand movements while engaging in conversation.

Previous to the beginning of the recording, participants were made aware of the general purpose of the study (i.e., to explore speech patterns in Córdoba) and were asked to read and sign a consent form (see Appendix A). Although the interview was intended to not be structured, that is, not follow a rigorous question-answer format, a set of questions (see Appendix B) was pre-designed to secure a productive conversation as well as a consistent line of topics that would elicit tokens of equal or similar lexical structure in all participants. Most of the questions derived from the conversation flow itself. Given the relatively low frequency of occurrence of the variable in colloquial speech, the pre-designed questions were purposefully intended to elicit language containing <y> and <ll> to collect an adequate and balanced number of tokens, ideally 50 per participant. The following is a sample question designed to produce the same tokens of <ll> in all participants:

R: ¿Cómo explicarías a un extranjero lo que es el asado? (How would you explain to a foreigner what a cookout is?)

The intent of this question was to elicit the production of words such as *parrilla* 'grill,' *costilla* 'ribs,' *morcilla* 'blood sausage,' and *molleja* 'gizzard,' all necessary to describe a typical Argentine cookout. Tokens of <y> are numerous given the high frequency occurrence of monosyllabic words such as *yo* 'I' and *ya* 'already.' In order to elicit tokens of <y> in a wider variety of phonological contexts, questions regarding typical foods in holidays were asked to prompt participants to say words such as *mayonesa* 'mayonnaise,' *mayo* 'May,' *yerba* 'yerba tea leaves.'

As a way of minimizing feelings of anxiety in the participants, prior to the beginning of the recording the author engaged them in informal conversation that focused on renewing preexisting bonds with relatives and friends or creating a setting of informality with new acquaintances. Most interviews happened in a relaxed atmosphere within the context of a customary mid-morning or mid-afternoon refreshment, which contributed to creating a more informal tone to the process. In general, all participants displayed a relaxed demeanor and an enthusiastic disposition toward being interviewed. With the exception of three participants with whom the conversation was difficult to maintain, the number of tokens desired was achieved and, in most cases, surpassed. All 65 participants successfully completed Part A, with a total of 5,809 tokens extracted from this portion of the interview: 2,509 for <ll> and 3,300 for <y>. It is to be noted that there are advantages as well as disadvantages in trying to collect tokens through a semi-structured conversation. While this context ensures speech of a more natural and spontaneous nature, it does not guarantee complete control of the environment on the part of the interviewer. Occasional unexpected noises, interruptions, and equipment issues are likely to occur. Moreover, this conversational environment may not yield the target minimum number of tokens needed nor tokens in all possible phonological contexts. Additionally, as mentioned above, the variables under scrutiny in this study happen to not be among the most frequent in colloquial speech, at least not enough to collect a large number of tokens in a relatively brief period of everyday conversation.

### 4.3.2 Part B: Reading passage (story)

After the semi-directed conversation portion of the interview, participants were asked to read a 300-word paragraph authored by the researcher for the purpose of this study. The paragraph was printed on paper and contained sufficient occurrences of tokens of <ll> and <y> in different phonological contexts. Participants were directed to read the paragraph out loud in a way that would feel the most natural to them.

Below is an excerpt of the reading passage, a legend about the origin of the herbal tea known as “*mate*,” a deep-rooted social drink in Argentina inherited from the indigenous Guaraní of the region (tokens are underlined for reader’s convenience):

*“La leyenda de la yerba mate cuenta cómo Yací, bella diosa de la luna, de larga cabellera blanca, bajó a mirar la belleza de la tierra. Maravillada por el canto de los grillos y el sonido del arroyo cristalino, yacía sobre la gramilla y no se percató del yaguareté que la vigilaba y seguía de cerca.”*

In most cases, the interview was conducted while drinking this herbal tea as is customary between meals. The complete paragraph, included in Appendix C, contains a total of 44 tokens: 23 tokens of <y> and 21 tokens of <ll> distributed in different phonological contexts, as shown in Table 4 below.

**Table 4**

*Examples of Tokens in Different Phonological Contexts Found in the Reading Passage*

Phrase initial		Position in word		Syllabic length		Syllabic context		Adjacent phoneme	
Pause	No pause	initial	medial	mono	polly	tonic	atonic	V_V	C_V
yacia	cuando ya	yerba	arroyo	ya	huyendo	oyó	ayudó	leyenda	conlleva
llenando	y llegó	llanto	belleza	N/A	llovizna	galletas	gramilla	ellos	las yerbas

Out of the 65 participants, 62 agreed to participate in the reading, while two expressed reluctance in reading out loud in front of the interviewer, and one was unable to read due to severe vision impairments. The total number of tokens produced for this task was 2,705: 1,248 for <ll> and 1,457 for <y>. Regardless of how comfortable the participants felt at this point in the interview, it was expected that this reading task would produce speech of a more conscious and careful nature and therefore the participants would display alternation between variables based on speech style (Kiesling, 2009; Labov, 1972; Schilling, 2013). It is to be noted here that this work was conducted within Labov's attention to speech (1972) framework, while at the same time recognizing that there exist other approaches to explore style shift, such as audience design (Bell, 1984) and speaker stance (Coupland, 2010), both of which remain beyond the scope of the present research.

#### **4.3.3 Part C: Word list and minimal pairs**

Following the paragraph reading, participants engaged in a reading of a word list. The list was comprised of seven <ll, y> true minimal pairs. Given the limited number of minimal pairs displaying <ll, y> contrast, and in order to include an assortment of tokens in a wider range of phonological contexts, an additional 36 pairs of words were included in which one word contained a token and the accompanying word was semi randomly selected. In some cases, both words have some type of semantic relationship between them, or they share the same number of syllables or the same syllabic stress. To further contribute to divert the participant's attention from the

purpose of the reading, ten distractor pairs of words not containing tokens complete the reading list, for a total of 53 pairs (Table 5).

**Table 5**

*Examples of Each Type of Word Pairs Read by the Participants*

True minimal pairs (7)	ralla - raya
Substitute minimal pairs (36)	lámpara – cuchillo
Distractors (10)	aroma – alfombra

A total of 50 tokens were embedded in different phonological contexts within the pairs: 26 corresponding to <y> and 24 to <ll>. The aggregate number of tokens produced in this task is 2,983: 1,485 for <ll> and 1,498 for <y>. The complete minimal pair list is provided in Appendix D.

#### **4.3.4 Part D: Picture naming task**

The fourth and final part of the interview consisted of a picture-naming task, in which participants were shown a set of cards with graphics and asked to orally describe what they saw. Picture naming has been a widely used method in cognitive related sciences to collect oral speech and analyze the relationship between language and thought processes (Glaser, 1992). In sociolinguistic studies, this tool has proved another useful approach to elicit speech of a more formal nature (Carvalho, 2003). Besides serving the purpose of comparing variation in the articulation of /j/ between vernacular and careful speech, this task was also intended to be an option for participants who might not be comfortable reading out loud, such as the two participants mentioned in 4.3.2. A total of 39 images were selected, of which 16 were

designed to render tokens for <ll>, 16 for <y>, and 7 were distractors. Figure 22 provides an example of each category. The complete set of picture cards is included in Appendix E.

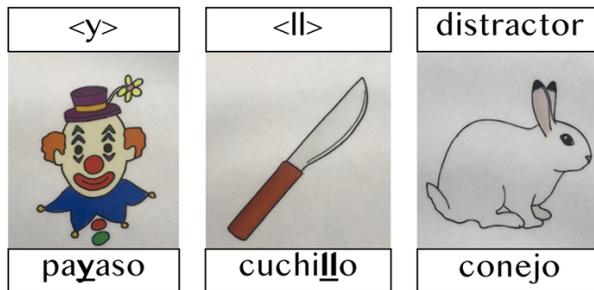


Figure 22. Sample images for words containing the tokens <ll> and <y> and distractors for picture naming task (Images extracted from LessonPix.com).

Of the 65 participants, two did not complete this task due to lack of sufficient time to complete this last part of the interview. A total of 1,500 tokens was collected in this task: 866 for <ll> and 634 for <y>.

#### 4.3.5 Demographic questionnaire

A written questionnaire adapted from Regan (2017b) was administered to participants at the end of the interview to collect additional information on the socioeconomic background of the individual and his family, such as education level achieved, neighborhood of residence, income range, and socioeconomic background of parents and grandparents (Appendix F). The participants themselves filled out the questionnaire under the supervision of the author. An explicit statement in the consent form signed prior to the interview assured participants that the information disclosed in the questionnaire was confidential and would remain in the researcher's exclusive

possession at all times. Demographic information collected from participants was recorded in the master Excel document under coded pseudonyms for each participant to protect their identities.

#### **4.4 Segmentation of tokens (pre-processing of data)**

The segmentation process for the data from the four parts of the sociolinguistic interview was executed with Praat (Boersma & Weenink, 2018) to visually and auditorily perform the following: 1) identify each participant's individual utterances containing the tokens in question; 2) segment words containing the tokens. If a token appears in a word-initial position, the preceding word was included in the segment to take into consideration the effect that an adjacent sound may have on the realization of the variants if no pause was made between words (Lang-Rigal, 2014); and 3) segment individual tokens, including the identification of the preceding and following phonemes to include in the analysis of duration and intensity (Lang-Rigal, 2014).

Following Colantoni (2006b) and Rost Bagudanch (2017), the duration boundaries of each fricative token were identified by observing changes in the waveform and in the spectrogram, as well as decreases and increases in intensity in the first three formants (F1, F2, F3) at the onset and offset of the interval respectively. The combination of these observations facilitates the identification of distinct acoustic characteristics of the variants given that the duration of the more relaxed, vowel-like allophones normally displays shorter values than allophones with a higher level of frication (Ladefoged and Maddieson, 1996, p. 98; Quilis 1993, p. 116).

To further support the visual analysis of the acoustic differences between the prepalatal [ʒ] and palatal [j], Rost Bagudanch (2017) notes that [j] presents a clear

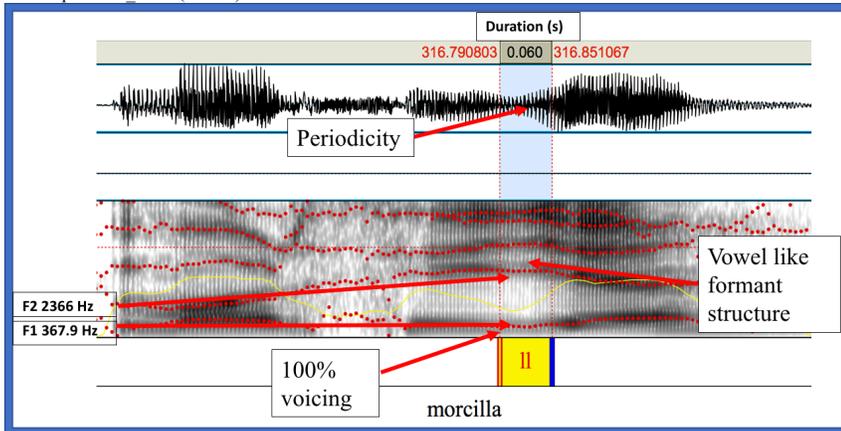
formantic structure and a smooth and long transition between previous and posterior sounds. F1 is usually situated within the 345 Hz range. For speaker 039\_MFC in this study, it is situated at 367 Hz (see Figure 23). F2 for [j] can normally be identified at a higher range above 2000 Hz, which is average for palatal sounds; speaker 039\_MFC displays this pattern at 2366 Hz. Formants in the spectrogram are seen clearly defined, as [j] is a voiced sound articulated with little friction. In the case of this participant, [j] appears to be articulated as an approximant [j] assimilating the features of the previous vocalic sound [i] with little to no change in the wave form and spectrogram. The segmentation of tokens for this sound posed the challenge of making decisions related to the exact point of onset and offset in cases where it was preceded or followed by the high vowel <i>, given the similarity in their acoustic features, as can be seen in the spectrogram in Figure 23. As Borzone de Manrique (1980) found in the analysis of 12 speakers from Buenos Aires, formant values of glides do not differ significantly from high vowel values. In such cases, a decrease in intensity at the onset and increase at the offset, and slight changes in the formants were used as cues to complement the auditory identification of these tokens and delineate the boundaries of the segment.

On the other hand, the prepalatal [ʝ] displays a much less structured formantic composition, corresponding to palatals with higher frication or turbulence caused by the partial interference of the air flow in the vocal tract, as can be seen in the articulation of <ll> in *parrilla* ‘grill’ by speaker 012\_MT in Figure 23. While duration can be impacted by intonation patterns in a conversational context, the duration of [ʝ] for this speaker corresponds to average duration for this palatal approximant consonant, at 79 ms. Intensity normally diminishes when compared to adjacent

sounds. The energy detected at medium frequency levels differs from the energy produced by more vocalic-type sounds, the latter presenting a higher level of periodicity than the former.

**Example of [j]**

Participant 049\_MFC (female)



**Example of [ʒ]**

Participant 012\_MT (female)

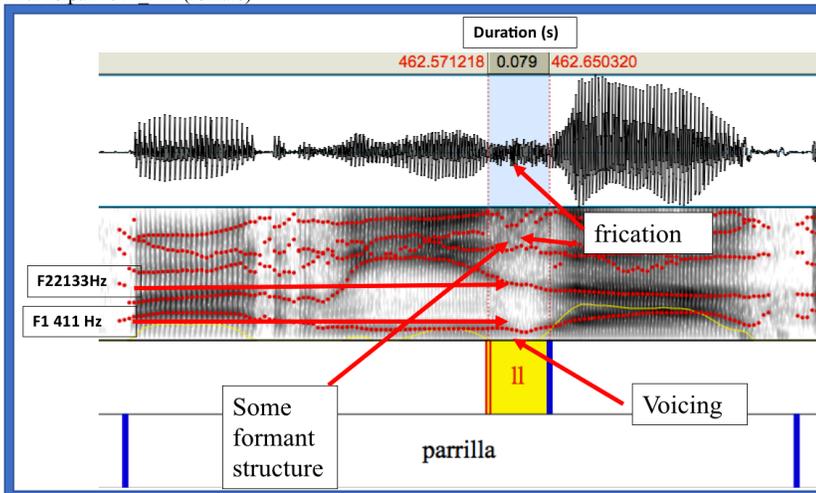


Figure 23. Female speakers' sound waves and spectrograms of /j/ in morcilla as [j] and /j/ in parrilla 'grill' as [ʒ].

The prepalatal fricative [ʒ] has been found to be articulated with gradient constriction patterns, at times acquiring the feature of a voiced affricate [dʒ] in Argentine Spanish, particularly after a nasal or lateral or in phrase initial position for emphasis, and it is characterized by a combination of the features of a stop and a fricative. The segmentation of [dʒ] was performed by visually locating the onset of the occlusion and burst (stop feature), and the frication phase that follows, noting that the latter is voiceless while the former shows some voicing toward the beginning and middle of the segment. This task was not without challenges, as this segment presents a wide range of variation in the occlusion, burst, and frication phases. In order to provide a replicable process of segmentation for future research, tokens with visible occlusion phases followed by frication were classified as [dʒ], with occlusion referring to silent sections (white in spectrogram) at the onset of the segment stretching vertically through all or most of the token. The frication phase generates high frequency noise and does not show clear formant structures (Orduz Navarrete, 2013). Duration of affricate allophones is typically longer than the duration for fricatives, averaging 90 ms (Rost Bagudanch, 2017). Figure 24 below shows an example of this variant in participant 001\_BLT producing the word *mayores* ‘elderly’ with an affricate articulation.

**Example of [dʒ]**

Participant 001\_BLT (female)

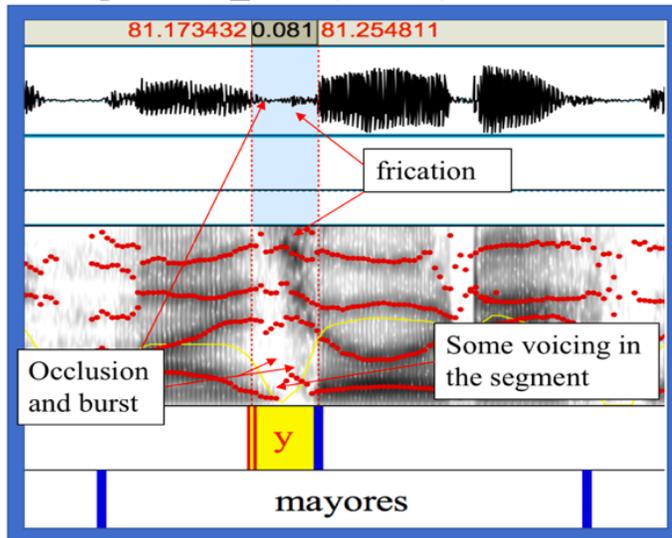


Figure 24. Female speaker’s sound waves and spectrogram of /j/ in *mayores* as [dʒ].

For the segmentation of [ʃ], following Colantoni (2006b), Chang (2008), and Rohena-Madrado (2015), the onset of the voiceless segment was marked when changes in the waveform and spectrogram were detected in relation to a decrease in intensity and decrease in F1; a diffusion of F2 and F3; the absence of a voicing bar in the lower part of the spectrogram; and the absence of periodicity in the wave forms replaced by high frequency noise (see Figure 25).

Example of [j]  
Participant 066 LS (female)

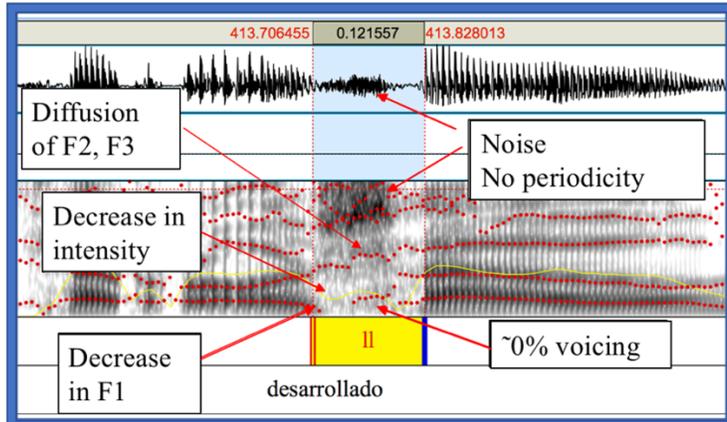


Figure 25. Female speaker's sound waves and spectrogram of /j/ in *desarrollado* as [j].

The palatal lateral [ʎ] was expected to emerge in the data primarily in the reading phase of the interview as participants shift to more conscious attention to the speech they produce. While acoustic characterizations of [ʎ] are scarce, Colantoni (2001) mentions previous research by Ladefoged et al. (1996, p. 193), in which they identify palatals laterals as having well defined formant structures with F1 usually found at low frequencies, normally below 400 Hz. According to Quilis' (1993) research on Peninsular Spanish, F2 and F3 can be found approximately at frequencies of 2,047 and 2,653 Hz respectively. Figure 4.5 below shows similar values for participant 011\_CS reading the word *calle* 'street' with the articulation of a lateral. Duration in this sample token taken from the reading of minimal pairs is 130 ms., which is almost twice as long as the duration reported by Colantoni (2001); however, as she compares differences between her participants and those of Quilis (1993), it is suggested that the articulation of palatal laterals in Argentine Spanish differ from that

of Peninsular Spanish not only in duration but also in the values of the formants. Furthermore, Colantoni (2001) found palatal laterals in the speech of participants from the province of Corrientes only, while the present study has identified a large enough number of tokens for palatal laterals to merit the inclusion of these segments in the analysis. The segmentation of this sound was performed by observing the above features in combination with visually determining the transitions between the preceding and following segments and marking the boundaries at the points where the formants begin to get broader and narrower at onset and offset respectively, as show in Figure 26.

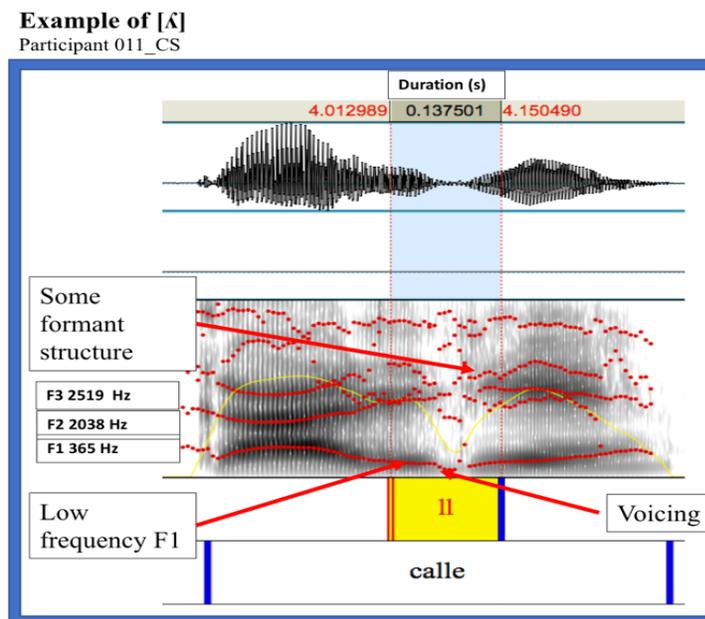


Figure 26. Female speaker's sound waves and spectrogram of articulation of *calle* with distinction [ʎ].

All information extracted from the above process of segmentation was recorded in individual Excel documents for each participant. Once the segmentation was completed, all tokens for individual participants were subjected to an automated Praat script by Elvira-Garía (2014) designed specifically to measure fricative parameters. Results for each participant were then entered in the master Excel document, including social factors collected through the demographic questionnaire administered at the end of the interview process.

## **4.5 Independent variables**

### **4.5.1 Social (extralinguistic) factors**

#### **4.5.1.1 Occupation and educational level**

Pioneered by Labov's groundbreaking sociolinguistic research in New York and in Martha's Vineyard (Labov, 1966b, 1972), subsequent research has consistently shown that there is a strong correlation between social class and the choice to use one variant over another depending on the social hierarchy to which an individual belongs (Cedergren, 1974; Feagin, 1979; Horvath, 1985; Trudgill, 1974). However, the task of establishing clear boundaries of social hierarchy in a community represents a challenging task. It is essential that a valid and reliable categorization for the speech community under investigation is used, taking into account that not one single factor serves as indicator of social class, but rather a combination of factors. Within the umbrella factor of social class, the single indicator that has been known to account for the greatest proportion of variant is occupation (Ash, 2013). In the present study, and to capitalize on sociological research on class in Córdoba in the recent past, social

class is defined based on occupation as well as on education level, following the hierarchy in Gutiérrez and Mansilla (2015) described in Figure 27.

**CLASE 1/4: CLASE BAJA DOMINADA (20%)** Bajo volumen global de capital con una estructura patrimonial asociada a bajas calificaciones laborales, capital escolar de nivel primario e IPCF entre el 1° y 2° decil.

Dominated low class: employment in the service industry such as cleaning and construction with a salary in the lowest percentile on a 1-10 scale. Primary school education incomplete or complete.

**CLASE 2/4: CLASE MEDIA DOMINADA (35%)**: Volumen y estructura patrimonial asociados a calificaciones laborales operativas, capital escolar medio incompleto e IPCF entre el 3° y 5° decil.

Dominated middle class: employment in the service or operational industries with a salary in the 3-5 percentile on a 1-10 scale. High school education incomplete.

**CLASE 3/4: CLASE MEDIA DOMINANTE (29%)**: Alto volumen global de capital con una estructura patrimonial asociada a calificaciones laborales técnicas, capital escolar Superior Universitario e IPCF entre el 7° y 9° decil.

Dominant middle class: employment in the technical labor industry, social and health services, or education, with a salary in the 7-9 percentile on a 1-10 scale. University level.

**CLASE 4/4: CLASE ALTA DOMINANTE (17%)**. Alto volumen global de capital con una estructura patrimonial asociada a la propiedad de empresas o el control de la fuerza laboral, calificaciones laborales profesionales e Ingresos en el 10° decil

Dominant upper class: Professional employment in business, education, administration, with a salary at the highest percentile on a 1-10 scale. University level education complete.

*Figure 27. Social hierarchy in Córdoba defined by occupation and educational level (Gutiérrez & Mansilla, 2015).*

To better account for the characteristics of the particular sample population in the current study (Labov, 2001), and accounting for the factor of economic power and control (Ash, 2013), the two groups labeled *dominated* (lower and middle) were combined in one, while the two groups labeled *dominant* (middle and upper) were merged into another group. The four original categories of occupations were reduced to two and a third group was created for the purpose of this study, to accommodate a

considerable number of participants for whom the previously mentioned groups were not adequately representative. At the time of the interview, these participants were unemployed, retired, full-time students, or housekeepers without a current compensated occupation. Consequently, for the purpose of this study, three levels of occupation will be considered in the analysis of the data, as shown and elaborated upon in Table 6.

**Table 6**

*Occupation Levels Based on Gutiérrez and Mansilla (2014) After Combining Four Levels into Two Groups and Adding a New Level to Account for Occupational Contexts Not Included in the Original Distribution*

CURRENT OCCUPATION		
Level 1	Level 2	Level 3
retired/student/unemployed/ housemaker	Commerce, retail/industry/operator / self-employed/construction/domestic service	Professionals / business owners/head of organizations/education/private sectors /Technicians/health/administration/state employment/wage-earning employee/legal area
20	20	25

Education was categorized in three groups as well, based on the level completed: 1) no education/elementary, 2) high school, 3) university/specialization. It is expected that participants with high school and university education completed and with level 3 occupations will show higher rates of prestige variants as well as those in level 1 who are retired from level 3 occupations, full time university students, and housekeepers. Less prestigious variants, on the other hand, are anticipated to surface

associated mostly with level 2 individuals with no or little education who are in a financial disadvantage when compared to the upper-level classes. This tendency, while evident in all participants, is expected to show stronger patterns in males than in females.

#### **4.5.1.2 Neighborhood of residence**

Based on previous studies investigating the evolution of the devoicing of [ʒ] in Buenos Aires and showing area of residence to be a significant factor (Chang, 2008; Rohena-Madrado, 2008, 2013), it was decided to include neighborhood as an independent variable. However, the rapid growth of the city of Córdoba in the last few decades, with new neighborhoods emerging in areas that do not match the traditional socioeconomic characteristics of its inhabitants, needs to be noted as a potential limitation. Because area of residence in a city the size of Córdoba with strong growth rates is not to be considered a discrete measure of social class as a free-standing factor, it is hypothesized that neighborhood of residence will interact with other social factors in this study to further circumscribe the socioeconomic hierarchy of this particular speech community (Labov, 2001; Tagliamonte, 2012).

It is generally agreed that members of a community have inherent knowledge of the social hierarchies that characterize their community (Trudgill, 1974). While the above social factors have been selected following the recommendation that researchers ought to take advantage of already established social categories (Ash, 2013), the inherent and intuitive knowledge of long-time members of a community regarding social hierarchies constitutes an additional resource from which to profit. Based on ethnographic observations, the author's personal knowledge of the speech community,

and the input received from members of the community, neighborhood of residence was included as another proxy of social class. To quantitatively define neighborhoods, the author followed a procedure similar to that used in Regan (2017a, p. 136). The value of land per parcel was extracted from the website for the city government's periodically updated land registry *idecor.cba.gov.ar* (Figure 28).

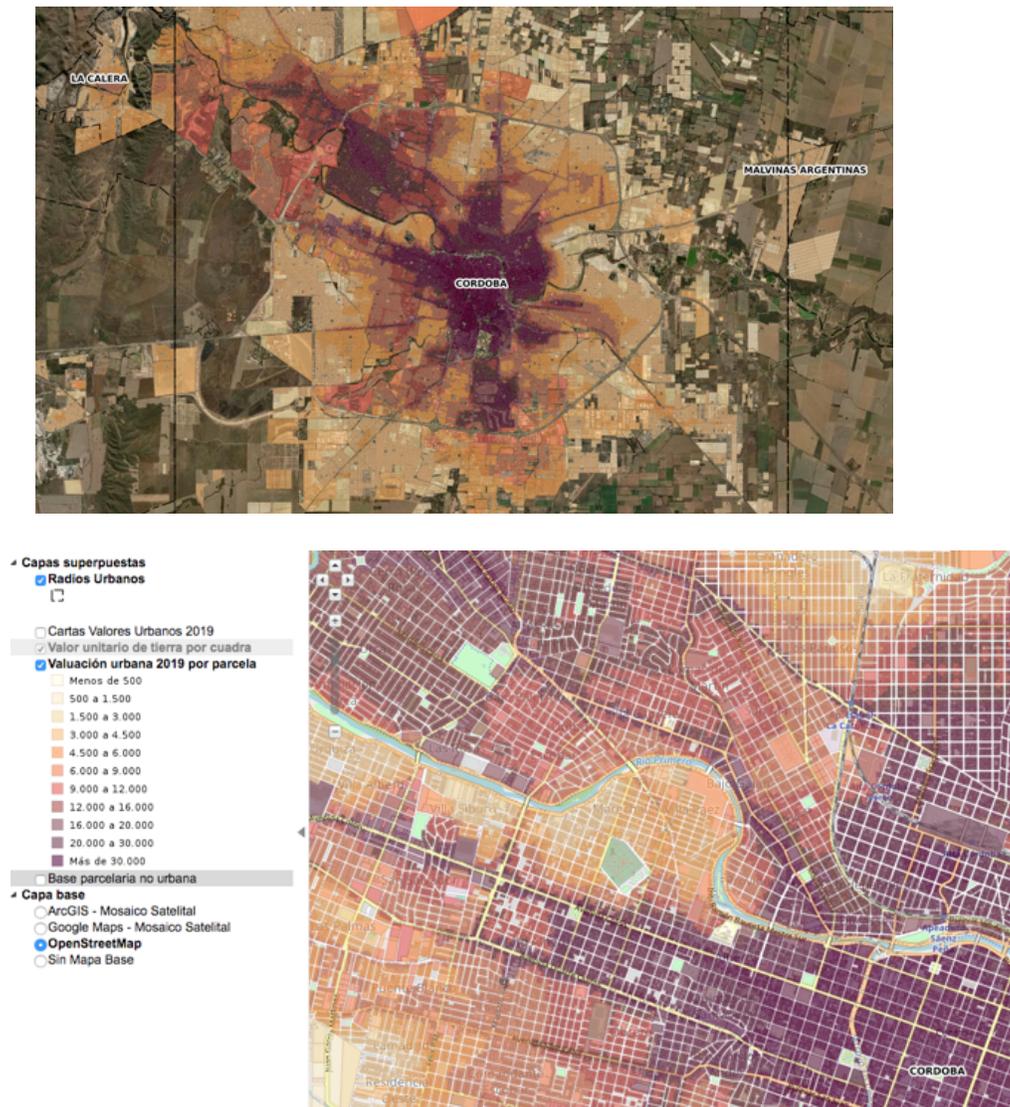


Figure 28. The map of Córdoba provided by *idecor.cba.gov.ar* displaying categories of parcel price levels per neighborhood.

#### **4.5.1.3 Salary range**

While participants were not asked to provide the specific salary amount, a salary range provided in the questionnaire served to rank individuals in six categories, which were later reduced to three levels that the author deemed to be accurate representations of these particular participants' socioeconomic status: Level 1 (\$0 – \$30K), Level 2 (\$30 – \$70K), Level 3 (\$70K+). Values represent salaries in Argentine pesos at the time of the interviews, May-June 2019. Salary range was included as an additional proxy to complement occupation and educational level as markers of class.

#### **4.5.1.4 Gender**

A clear and strong contrast between men and women's speech patterns has been shown consistently in sociolinguistic studies (Labov, 1990), with women normally tending to avoid stigmatized variants and being more aware of prestige norms than men (Labov, 1972). Based on the author's ethnographic observations of the community from an insider's point of view, and on evidence provided by previous studies, it is anticipated that the quantitative analysis of the usage of the variants by men and women will provide support in favor of Labov's (2001) Principle 2: Women use less stigmatized variants than men but more prestigious variants, in this case [ʒ] in a gradient range of strengthened articulations. Gender is expected to interact with social class, as found in earlier studies where variation between men and women was found to be explained, at least in part, in terms of their different orientations to class (Labov, 1990). Women tend to have a greater orientation to community prestige forms as a way to grow a symbolic capital in the form of language in societies where it is their only option to secure a manner of power.

#### **4.5.1.5 Age**

Generational differences constitute another significant component of variation in speech according to age. Because this is a study of apparent time (Labov, 1994), comparing such differences at one point in time will guide conclusions regarding how a change may have occurred in the recent past (Tagliamonte, 2012). The age factor was framed both as a continuous and a categorical variable. While categorical groups are useful to yield mean differences among classification cohorts, continuous numerical values return more detailed information about the slope of the line and provide a more detailed depiction of the variation in both the predictor and the response. Three categorical age groups were defined to reflect the categorization found in the 2010 census report provided by the Instituto Nacional de Estadísticas y Censos (Mestre, 2017): young (18-30; born between 1989-2001), adult (31-64; born between 1955-1988) and senior (65+; born 1954 or earlier). These groups roughly represent the population before, during, and after Supisiche's (1994) study that included *yeísmo* in Córdoba during the years 1989-1994.

#### **4.5.1.6 Speech Style**

Style is another factor that has been found to have strong correlations with language variation and change, and in addition tends to intersect with sex and social class (Kiesling, 2009; Labov, 1972; Schilling, 2013; Tagliamonte, 2012). As mentioned earlier, the current study defines speech style as “attention paid to speech” (Labov, 1972). Participants in this study produced both vernacular, informal speech during the sociolinguistic interview, as well as speech of a more careful and conscious nature through the reading of a paragraph, a word list of minimal pairs containing the

linguistic variables in question, and a picture-naming task. It is anticipated that participants will display differences in how often and to what extent they style shift (Eckert, 2000). Within the Labovian model corresponding to the first wave of studies of variation and change, style shifting within the same speaker indicates variation based on the amount of attention paid to speech and the formality of the context to which the individual reacts. Subsequent waves of studies have explored style shifting under a theoretical framework that considers personal and group identities and stances as factors that impact the selection of speech style (Schilling, 2013).

#### **4.5.2 Linguistic factors**

Possible contexts for <ll> and <y> as identified in previous studies on *yeísmo* were considered in this study (Celdrán & Fernández Planas, 2007, pp. 62-63; Chang 2008; Colantoni, 2006a, 2006b; Fernández Trinidad, 2010; Gómez Molina & Gómez Devís, 2016; Gradoville, 2011; Lang-Rigal 2015b; Rost Bagudanch, 2017, 2018; Scarpace et al., 2015). The phonological environment surrounding a segment can have an impact on the articulation of the phoneme in the form of coarticulation processes such as assimilation or dissimilation (Colantoni, 2006a; Moreno-Fernández, 2011; Scarpace et al., 2015). Linguistic contexts identified in previous studies to have had an impact on the articulation of palatal fricatives, and considered in this study, are:

- Position in word
  - o word initial or word middle, no word final palatal fricative and its allophones are found in word final position.
- Position in phrase

- phrase initial after pause, phrase initial with no pause.
- Syllabic length
  - monosyllable or polysyllable.
- Syllabic context
  - stressed/tonic or nonstressed/tonic
- Following phoneme
  - /i/, /e/, /a/, /o/, /u/

A summary of linguistic factors taken into consideration in this study are given in Table 7 below with sample words from the data. These factors are not to be considered in isolation, as they interact with one another to impact the segment in question. For example, phonetic processes identified in previous studies mentioned above show that a palatal fricative in onset position in a tonic syllable (*oyó* ‘he heard’), in phrase initial position after a pause (*#yerba* ‘yerba tea leaves’), or after a consonant (*conlleva* ‘it entails,’ *al llegar* ‘upon arrival’) tends to favor a more careful and constricted articulation than counterparts in an atonic syllable (*ayudó* ‘he helped’), in mid-word/phrase position (*y llegó* ‘and he arrived’), or after a vowel (*leyenda* ‘legend’). Similarly, a palatal fricative followed by a vowel renders itself susceptible to the acoustic patterns (intensity, voicing, duration) of such vowel. Moreover, the extent and type of effect of an adjacent vowel can be determined by the classification of the vowel according to its articulatory classification: front, central, or back; high, mid, or low; rounded or not rounded.

Because instances of <ll> in monosyllable words are nonexistent in Spanish, syllabic length applies only to <y> and in interaction with position in phrase, syllabic context and adjacent phonemes in terms of greater or lesser levels of constriction.

**Table 7**

*Examples from the Data of Linguistic Contexts for the Occurrence of <ll> and <y>*

Phrase initial		Position in word		Syllabic length		Syllabic context		Adjacent phoneme	
Pause	No pause	initial	medial	mono	polly	tonic	atonic	V_V	C_V
<i>yacía</i>	<i>cuando ya</i>	<i>yerba</i>	<i>arroyo</i>	<i>ya</i>	<i>huyendo</i>	<i>oyó</i>	<i>ayudó</i>	<i>leyenda</i>	<i>conlleva</i>
<i>llenando</i>	<i>y llegó</i>	<i>llanto</i>	<i>belleza</i>	N/A	<i>llovizna</i>	<i>galletas</i>	<i>gramilla</i>	<i>ellos</i>	<i>las yerbas</i>

The low frequency of words containing <ll> and <y> in Spanish in everyday conversations and the unbalanced number of occurrences of each phoneme in different phonological contexts is a limitation of this study that should be taken into consideration. Instances of word-internal <y> as /j/ in post-consonantal position after <n>, <b>, and <d> occur in words such as *inyección*, *abyecto*, and *adyacente*. However, the use of words such as these is not likely to surface naturally in vernacular conversations. Fewer instances of internal <ll> after a consonant are found in the Spanish word inventory, such as *conllevar*. Monosyllabic lexical units containing <ll> are nonexistent in Spanish. Because certain words such as *yo*, *ya*, *allá*, tend to occur much more frequently than others, and because each participant displays different patterns of speech, the variables *word* and *speaker* do not fall into the category of controlled components. As such, they are included in the analysis as random factors.

#### 4.6 Dependent measures

This study employs both a segmental and an acoustic analysis. While the tendency in sociophonetics is to employ a gradient approach towards phonetic variants, the current study presents variants that do not appear to be able to be distinguished based on one continuous dependent measure. That is, the diverse array of palatal variation in the speech community of Córdoba presents five different variants in the current study ([j], [ʒ], [dʒ], [ʝ], [ʎ]) and therefore cannot be examined with one acoustic measure. Although many previous studies have used the acoustic measure of *percent of voicing* to distinguish [ʒ] and [ʝ] (Chang, 2008; Colantoni, 2006b, 2008; Lang-Rigal, 2013; Rohena-Madrado, 2015), this measure is only useful to separate [ʝ] from the other variants, as all other variants are voiced and percent voicing cannot therefore distinguish [j] from [ʒ] (nor from [ʎ]). Additionally, von Essen (2016, 2020) has found normalized zero-crossings to help distinguish frication features of [j] from [ʒ] from [ʝ] among Argentine speakers in Málaga, Spain, indicating that the more fricative-like variants have higher zero-crossings. However, even the normalized zero-crossings in von Essens' studies demonstrate an effect of biologically-related sex effects in which women in general have much higher zero-crossings across all three variants compared to men. Additionally, zero-crossings as an acoustic measure does not work for affricate [dʒ], nor would it help distinguish [ʎ] from the other variants. Finally, to date there are no reliable acoustic measures that separate [j] from [ʎ], particularly considering the current data includes spontaneous

speech in addition to more controlled read speech<sup>6</sup>. Thus, the sheer number of variants present in the speech community provides problems for the use of one acoustic measure on a gradient scale across variants. To examine if any measures would capture these differences, all of the data were examined together with the four spectral parameters (COG, variance, skewness, kurtosis), intensity (dB) (minimum, mean, maximum), and duration (ms). However, the statistical analyses and data visualization of these different acoustic measures did not demonstrate the variation that was present in the data. Thus, another method was created in order to best demonstrate the variation in the data.

In order to address this issue, Dr. Miquel Simonet and Dr. Brendan Regan brainstormed a means of creating a replicable acoustic process of using known acoustic cues as visualized on Praat to acoustically segment the different variants. While auditory analysis is also quite valid particularly when implemented with inter-rater reliability, this process aims to avoid any inter-listener auditory biases by using visual acoustic cues in Praat instead of auditory coding. The three main acoustic features considered were: (1) VOICING; (2) FRICATION; and (3) OCCLUSION as seen in Table 8. All were coded for while visually examining Praat, as the examples seen in Figure 29. For VOICING, it was a binary choice of yes or no, that is, was there a voice bar or not at the bottom of the spectrogram? It is important to note that any voiceless fricative in intervocalic position will have some voicing due to coarticulation as

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<sup>6</sup> As has been found in previous studies, data collected via elicited tasks may yield different results given by the activation of the participants' awareness of their linguistic choices, such as Beristain's (2020) study of the delateralization of /ʎ/ in Spanish and Basque in which *IntDiff* (dB) was found to be reliable acoustic measure for distinguishing /ʎ/ from /j/.

demonstrated by Rohena-Madrazo's (2015) comparison of voicing levels in [s] compared to [ʃ] to show that young middle class *porteño/as* had completed the devoicing of [ʒ]. Thus, the start and end of a fricative (the transition segments) will generally have some voicing. From a theoretical phonological standpoint, voiceless means no voicing, but from a phonetics perspective we know that voiceless sounds get some voicing due to coarticulation. It has also been found that voiced fricatives that are longer in duration than the following vowel can be perceived as more voiceless, while a short enough duration would likely be perceived as more voiced (Crystal & House, 1988; Lang-Rigal, 2015b).

Thus, for the current study, a segment was coded as having voicing if at least the middle 50-60% of the segment demonstrated a voice bar. For FRICATION, it was a binary choice of yes or no, that is, was there frication or periodicity in the waveform of the segment? For OCCLUSION, this was also coded binarily as well, yes/no, in which the presence of any full occlusion as seen in the spectrogram and waveform was coded yes, and the lack thereof occlusion was coded no. Based on these three acoustic parameters, we could reliably distinguish between four of the five variants present in the data: [j] (voicing: yes, frication: no, occlusion: no)<sup>7</sup>, [ʒ] (voicing: yes, frication: yes, occlusion: no), [dʒ] (voicing: yes, frication: yes, occlusion: yes), [ʃ] (voicing: no, frication: yes, occlusion: no). The one limitation of these three acoustic features is that they do not help to separate [j] from [ʌ]. The acoustic feature analyzed here was the F2 and F3 trajectories in the spectrogram to examine any sharp changes in the formants

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<sup>7</sup> A limitation of this categorization is acknowledged here as it is possible for this segment to be articulated with weak frication and still be very different from the prepalatal voiced realization (Rost-Bagudanch, 2013, 2017).

midway through the segment. The author also listened to these two variants in order to provide additional support for the F2/F3 observations. Following this replicable process, each of the five different variants were coded for and were then ready for a segmental analysis. Thus, the classifications served as categorical dependent variables.

**Table 8**

*Classification of Segments Using a Visual Replicable Process in Praat*

Voicing	Frication	Occlusion	F2/F3	Classification
Yes	No	No	No	[j]
Yes	Yes	No	--	[ʒ]
Yes	Yes	Yes	--	[dʒ]
No	Yes	No	--	[ʃ]
Yes	No	No	Pinch	[ʌ]

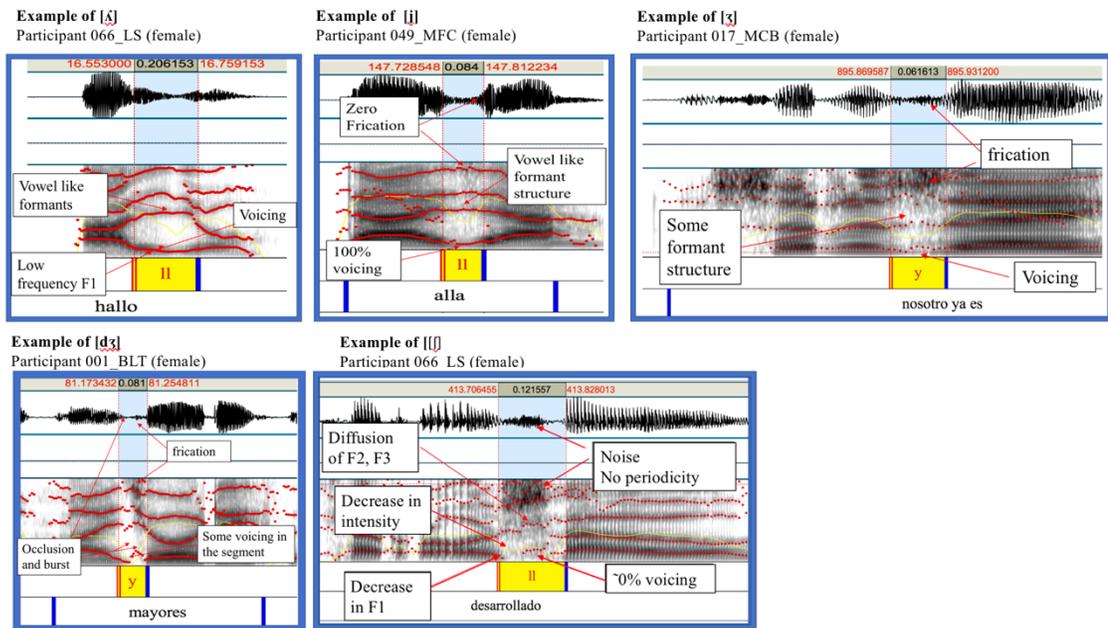


Figure 29. Examples of visual inspection for the segmental analysis of [j], [ʒ], [dʒ], [ʃ] and of [ʌ].

For the acoustic analyses, an automated Praat script written by Elvira-García (2014) was used to measure duration (ms), normalized zero-crossings, mean intensity (dB), center of gravity (Hz), variance (Hz), skewness, kurtosis for each token. As will be discussed in the results chapter, acoustic analyses were conducted only for [j] vs. [ʒ] and then [ʒ] versus [ʃ]. Prior to any statistical analyses, the data was subject to data visualization based on realization with several dependent measures (duration (ms), normalized zero crossings, mean intensity (dB), center of gravity (Hz), variance (Hz), skewness, kurtosis) in order to assess if these acoustic measures demonstrated differences between the two variants. The analyses demonstrated that for [j] versus [ʒ], normalized zero-crossings and mean intensity (dB) appeared to be the most useful parameters to distinguish the two variants. However, upon-further examination, normalized zero-crossings demonstrated a large effect of biologically-related sex differences and was therefore not used. Thus, only mean intensity (dB) was used for [j] versus [ʒ] in which the more approximant-like [j] realizations have higher mean intensity than the more fricative-like [ʒ] realizations. For [ʒ] versus [ʃ], the most robust acoustic measure to distinguish the variants were normalized zero-crossings and duration (ms), however, again, the zero-crossings demonstrated a large effect of biologically-related sex differences and was therefore not used. Subsequently, only duration was used in which a longer duration (ms) should be interpreted as a more [ʃ]-like realization while shorter duration (ms) should be interpreted as a more [ʒ]-like realization. Thus, acoustic results complement the segmental results

#### 4.7 Statistical analysis

For the segmental analysis, as [ʒ] was the most frequent variant, it was placed into different mixed-effects logistic regressions with each of the other variants: [ʒ] vs. [j], [ʒ] vs. [dʒ], [ʒ] vs. [ʃ], and [ʒ] vs. [ʎ]. It should be noted that each mixed-effects logistic regression model was fitted using the *lmer* function (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2014) in R (R Core Team, 2020) with all the linguistic and social factors as fixed effects and participant as a random factor. Originally word was included as a random factor, but as there were too many levels (i.e., too many individual words), the models did not converge. Thus, a separate fixed factor was created in order to account for highly frequent words. Specifically, *yo* ‘I’ occurred 1,692 times (13.02% of the total data) and *ya* ‘already’ occurred 642 times (4.9% of the total data). Thus, a separate fixed factor titled “Word” was included with three levels: *yo*, *ya*, other. Following Tagliamonte and Baayen (2012), prior to each individual model, a random forest was conducted using the *cforest()* function from the *party* package (Hothorn et al., 2020) to determine the importance of each variable. In each regression analysis, the independent variables were listed by order of importance. All variables were included in original regression models and then non-significant factors were removed from subsequent models. Interactions were tested among independent variables as well. R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et al., 2018).

The follow up acoustic analyses were conducted with the dependent measure of mean intensity (dB) for [j] and [ʒ] and then duration (ms) for [ʒ] and [ʃ] in mixed-effects linear regressions. Each mixed-effects linear regression model was fitted using the *lmer* function (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2014) in R (R Core Team, 2020) with all the linguistic and social factors as fixed effects and participant as a random factor. As above, following Tagliamonte and Baayen (2012), prior to each individual model, a random forest was conducted using the *cforest()* function from the *party* package (Hothorn et al., 2020) to determine the importance of each variable prior to regression modeling. R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et al., 2018). Finally, figures were created with *ggplot2* (Wickham, 2013).

## CHAPTER 5

### RESULTS

#### 5.1 Segmental analysis

##### 5.1.1 Descriptive statistics

Of the 13,015 overall tokens, there were 608 [j], 8,015 [ʒ], 2,128 [dʒ], 1,750 [ʃ], and 514 [ʎ] realizations. This varied per style as seen in Figure 30: Style A (spontaneous speech): 444 [j], 3,687 [ʒ], 1,000 [dʒ], 691 [ʃ], and 1 [ʎ]; Style B (passage reading): 61 [j], 1,883 [ʒ], 364 [dʒ], 370 [ʃ], and 30 [ʎ]; Style C (word list): 48 [j], 1,525 [ʒ], 578 [dʒ], 395 [ʃ], and 438 [ʎ]; and Style D (picture task): 55 [j], 920 [ʒ], 186 [dʒ], 294 [ʃ], and 45 [ʎ]. While there is a great deal of variation between the different phones, the overwhelming majority of the realizations are the palatal fricative [ʒ], especially when also including the palatal affricate [dʒ].

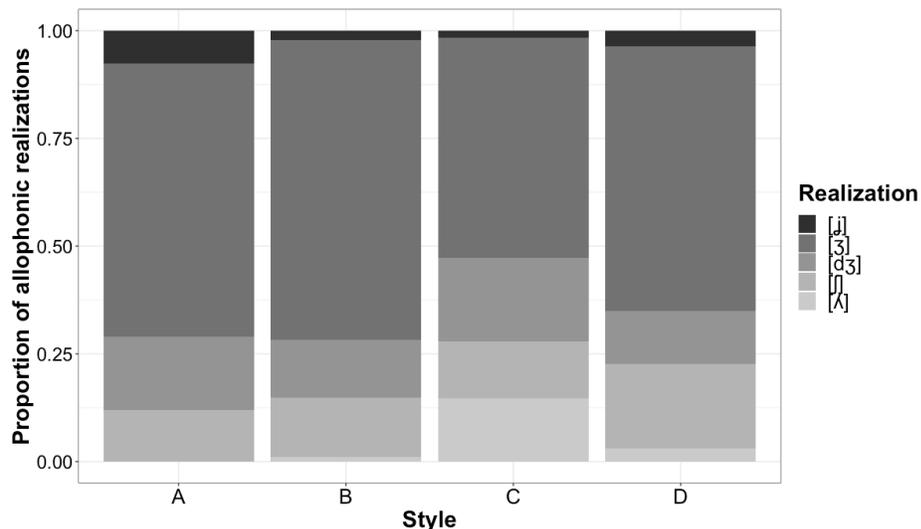


Figure 30. Overall realizations by speech style (A = spontaneous speech, B = passage reading, C = word lists, D = picture naming task).

Before beginning any inferential statistics based on linguistic and social factors with speakers grouped together, it is essential to examine the allophonic variation per individual speaker as seen in Table 9. There are several overall patterns one observes from examining the individual speaker realizations. First, nearly all speakers produce [ʒ]/[dʒ] as their dominant norm. Second, speakers either vary between [j] and [ʒ]/[dʒ] or between [ʃ] and [ʒ]/[dʒ]. That is, there are very few speakers who alternate consistently between these three realizations ([j], [ʒ]/[dʒ], [ʃ]). Third, within the individual speaker token counts, there is no clear pattern for speakers producing the palatal lateral /ʎ/. That is, it appears that speakers who vary between [j] and [ʒ]/[dʒ] as well as those who vary between [ʃ] and [ʒ]/[dʒ] produce this type of variation, although as seen in Figure 5.1, /ʎ/ is almost exclusively realized in the most formal task of the word list (Section 5.1.2.3 will demonstrate that the production of the palatal lateral phoneme is almost exclusively realized by the older speakers in Style C for orthographic <ll>).

**Table 9**

*Phonic Realization per Individual Speaker (n = 65).*

#	Participant	[j]	[ʒ]	[dʒ]	[ʃ]	[ʎ]
1	001_BLT	0	43	86	84	24
2	002_LAM	9	263	51	1	1
3	003_AS	0	146	13	4	6
4	004_WDS	19	158	47	3	15
5	005_JCL	3	187	19	1	10
6	007_CC	0	69	38	157	7
7	009_FP	1	42	10	96	22
8	010_ASP	2	65	31	79	0
9	011_CS	0	292	111	18	6
10	012_MT	0	179	22	10	8

**Table 9, Continued**

11	013_HT	3	148	14	0	0
12	014_MDP	0	149	12	50	20
13	015_IL	17	194	42	18	1
14	017_MCB	0	125	56	52	6
15	018_CGP	0	146	13	0	0
16	019_MJS	20	55	65	47	16
17	020_MF	37	120	42	9	2
18	021_AF	2	96	24	18	2
19	022_VG	0	91	59	64	0
20	023_MAV	0	151	50	8	11
21	024_MRR	7	116	71	58	26
22	025_AT	0	100	46	58	3
23	026_REM	2	148	31	40	36
24	027_DA	45	104	13	0	0
25	028_HA	2	151	47	0	13
26	029_JG	38	151	46	4	7
27	030_MS	7	175	44	4	2
28	031_GC	2	128	15	11	0
29	032_CMT	1	167	36	8	9
30	033_AG	0	181	35	3	10
31	034_ML	3	77	22	14	0
32	035_MAS	0	110	69	20	0
33	036_AB	0	162	21	0	8
34	037_CA	1	172	41	8	5
35	039_MFC	37	98	12	3	0
36	040_FP	25	91	37	4	24
37	041_JC	122	98	16	1	2
38	042_YA	2	149	10	1	10
39	043_MP	0	39	9	0	0
40	044_GI	3	148	21	0	4
41	04_JC	0	7	5	159	0
42	048_S0S	16	159	23	3	14
43	049_EC	6	49	33	21	0
44	050_RM	18	245	24	3	3
45	051_PML	14	146	108	15	0
46	052_LAS	10	197	23	2	3
47	053_MR	0	218	27	0	2
48	054_EL	0	220	59	6	1
49	055_DH	37	71	25	8	0
50	056_DEH	59	114	5	6	0
51	057_AC	20	43	41	6	0
52	058_CM	0	22	8	2	0
53	059_JT	5	183	21	0	0

**Table 9, Continued**

54	060_BRN	3	33	22	96	7
55	061_AQ	0	89	7	40	0
56	062_AT	0	80	33	33	1
57	063_AL	4	80	34	73	17
58	064_FA	3	116	25	0	26
59	065_YAU	0	53	10	47	0
60	066_LS	1	7	10	111	56
61	067_EI	1	132	51	2	12
62	068_LCT	0	103	36	68	11
63	069_AR	0	158	10	10	10
64	070_ILP	0	52	18	68	18
65	08_GG	1	154	23	15	17
	<b>TOTALS</b>	<b>608</b>	<b>8,015</b>	<b>2,128</b>	<b>1,750</b>	<b>514</b>

Given that most individuals' dominant norm varied between fricative [ʒ] and affricate [dʒ], it was thought to combine these allophones into one variant ([d]/[dʒ]) into one category as some of the previous literature combines these two allophonic variants, in which the affricate is seen as complementary distribution after a pause. Combining these two variants would then allow us to conduct several different analyses: [j] versus [ʒ]/[dʒ], [ɲ] versus [ʒ]/[dʒ], and [ʎ] versus [ʒ]/[dʒ]. However, prior to combining these allophones into one category, a mixed-effects logistic regression was conducted between fricative [ʒ] and affricate [dʒ] to verify if such a combination would be warranted.

### 5.1.2 Inferential statistics: mixed-effects logistic regressions

It should be noted that each mixed-effects logistic regression model was fitted using the *lmer* function (Bates et al., 2015) and *lmerTest* (Kuznetsova et al., 2014) in R (R Core Team, 2020) with all the linguistic and social factors as fixed effects and speaker as a random factor. Originally word was included as a random factor, but as

there were too many levels (i.e., too many individual words), the models did not converge. Thus, a separate fixed factor was created in order to account for highly frequent words. Specifically, *yo* ‘I’ occurred 1,692 times (13.02% of the total data) and *ya* ‘already’ occurred 642 times (4.9% of the total data). Thus, a separate fixed factor entitled “Word” was included with three levels: *yo*, *ya*, other. Following Tagliamonte and Baayen (2012), prior to each individual model, a random forest was conducted using the *cforest()* function from the *party* package (Hothorn et al., 2020) to determine the importance of each variable. In each regression analysis, the independent variables were listed by order of importance. All variables were included in original regression models and then non-significant factors were removed from subsequent models. Interactions were tested among independent variables as well. Figures were created with *ggplot2* (Wickham, 2013).

### 5.1.2.1 Mixed-effects logistic regression of [ʒ] versus [dʒ]

Of the total 10,143 /ʒ/ tokens, 8,590 were realized as [ʒ] and 1,553 as [dʒ]. The mixed-effects logistic regression presents the estimate, the standard error (*SE*), *z*-value, percent of affricate [dʒ] realizations per level, total tokens of /ʒ/ per level, and *p*-values. The model is in reference to [dʒ] realizations, thus positive estimates indicate that the listed predictor favors [dʒ], while negative estimates disfavor [dʒ]. Marginal R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et

al., 2018). The best mixed-effects logistic regression for [ʒ] versus [dʒ] is presented in Table 10.

**Table 10**

*Summary of Mixed-effects Logistic Regression for Fricative [ʒ] Versus Affricate [dʒ] Variation, in Reference to [dʒ] Realizations, Speaker as a Random Factor, n = 10,143 (R2m: 0.25, R2c: 0.36)*

Predictors	Estimate	SE	z-value	% [dʒ]	Total tokens	p-value
(Intercept)	-1.93	0.18	-10.68	---	---	< 0.001
Pause (Ref = No)	---	---	---	13.8	8590	---
Yes	1.57	0.11	14.06	60.7	1553	< 0.001
Word (Ref = other)	---	---	---	17.5	7806	---
Ya	0.02	0.17	0.13	25.6	642	0.90
Yo	0.19	0.14	1.42	35.5	1695	0.16
Style (Ref = A)	---	---	---	21.3	4687	---
B	0.61	0.10	6.10	16.2	2247	< 0.001
C	1.13	0.10	10.95	27.5	2103	< 0.001
D	0.63	0.12	5.27	16.8	1106	< 0.001
Gender (Ref = Female)	---	---	---	26.2	5209	---
Male	-0.82	0.19	-4.29	15.4	4934	< 0.001
PositionWord (Ref = Initial)	---	---	---	31.3	4611	---
Mid	-0.51	0.90	-5.93	12.4	5532	< 0.001
AgeGroup (Ref = Adult)	---	---	---	20.3	6531	---
Senior	0.68	0.27	2.55	28.9	1504	< 0.05
Young	-0.36	0.22	-1.66	17.3	2108	0.097
Orthography (Ref = <ll>)	---	---	---	14.5	4490	---
<y>	0.24	0.07	3.34	26.1	5653	< 0.001

**Table 10, Continued**

Pause:Word (Ref = No:Other)	---	---	---	13.2	6977	---
Yes:Ya	0.87	0.25	3.47	61.3	150	< 0.001
Yes:Yo	1.23	0.17	7.21	71.3	574	< 0.001

The main effect of pause indicates that [dʒ] is more favored after a pause as seen in Figure 31. The main effect of style indicates that [dʒ] realizations are most favored in Style C (word list) followed by Style A (spontaneous speech), while [dʒ] was less favored by Style B (passage reading) and Style D (picture task) as seen in Figure 31. A post-hoc analysis of the estimated marginal means indicates that each style was significantly different from one another (all at  $p < 0.001$ ) with the exception of Styles B and D ( $p = 0.997$ ). The main effect of gender demonstrates that women favor [dʒ] more than men as seen in Figure 32. The main effect of position in the word demonstrates that word-initial position favors [dʒ] more than word-medial position as seen in Figure 32. The main effect of age group demonstrates that the oldest group of speakers favors [dʒ] more than the adults ( $p < 0.05$ ) and the younger speakers ( $p < 0.01$ ), but there were no differences between the adults and younger speakers ( $p = 0.22$ ) as seen in Figure 33. The main effect of orthography seen in Figure 33 demonstrates that <y> favors [dʒ] more than <ll>. Finally, the pause by word interaction revealed that there were no statistically significant differences between words that were not following a pause. However, for words following a pause, *yo* favored [dʒ] more than *ya* ( $p < 0.05$ ) and *other* ( $p < 0.001$ ) and *ya* favored [dʒ] more

than *other* ( $p < 0.001$ ) as seen in Figure 34. For each word, there was a significant difference (all at  $p < 0.001$ ) in which the same word after a pause much more favored [dʒ] than not after a pause.

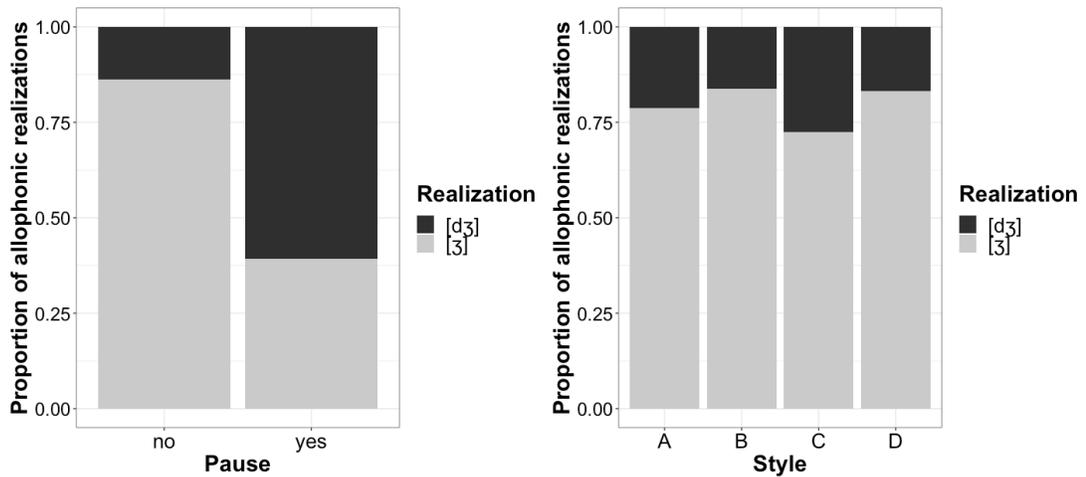


Figure 31. Left: Main effect of pause for /ʒ/ realizations; Right: Main effect of style for /ʒ/ realizations.

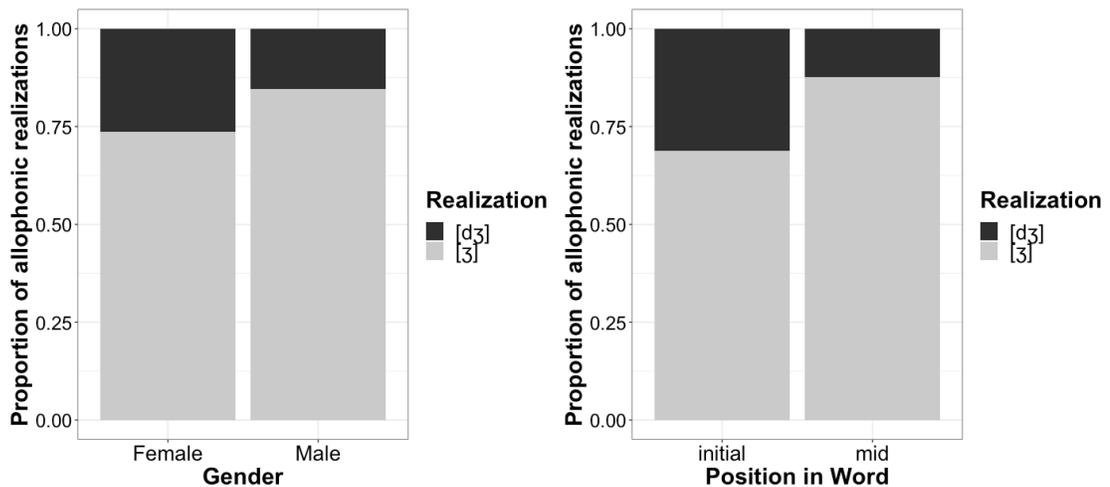


Figure 32. Left: Main effect of gender for /ʒ/ realizations; Right: Main effect of position in word for /ʒ/ realizations.

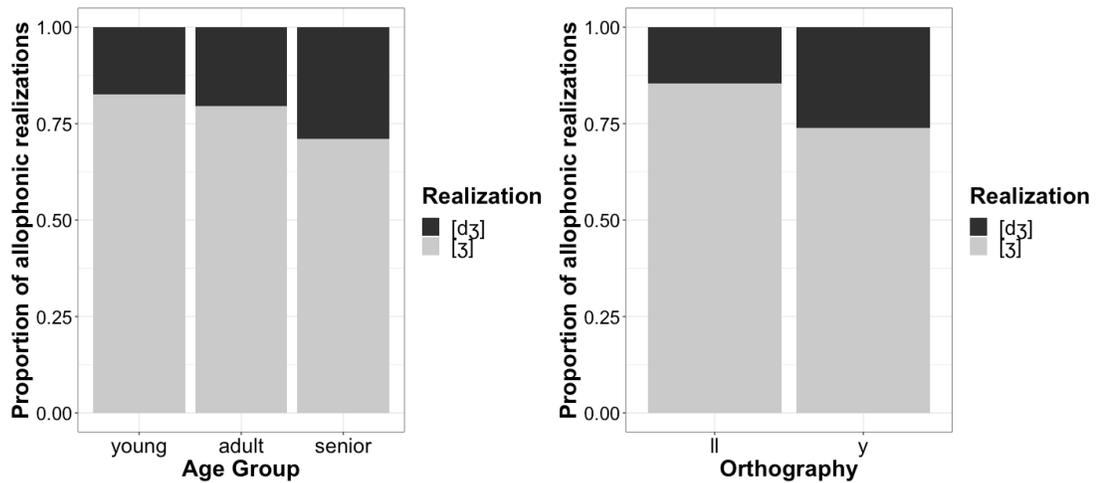


Figure 33. Left: Main effect of age group for /z/ realizations; Right: Main effect of orthography for /z/ realizations.

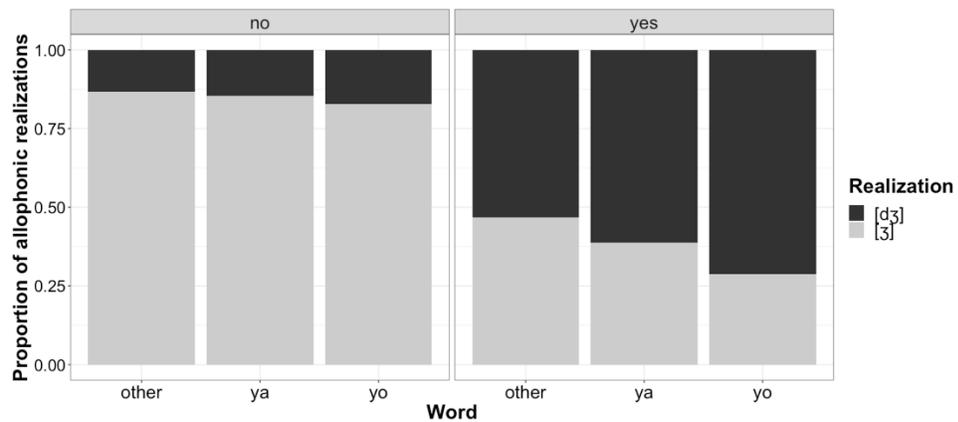


Figure 34. Interaction between pause and word for /z/ realizations.

Based on these results one could make the argument that [ʒ] and [dʒ] demonstrate a type of complementary distribution for /z/ in which they vary based on whether or not a token is directly after a pause, perhaps also demonstrating some word specific-phonetics (Pierrehumbert, 2001) tendencies with words like *ya* and *yo* after a pause. However, given there were social factors that were significant, age and gender,

this indicates that perhaps [ʒ] and [dʒ] are not merely distributed complementary (after pause = [dʒ], non-pause = [ʒ]), but rather demonstrate some social differences as well. Thus, to take a conservative approach, the rest of the analysis here compares each other variant ([j], [ʃ], [ʌ]) to solely [ʒ]. Thus, the following sections analyze the linguistic and social factors that best predict the variation between [j] versus [ʒ], then [ʃ] versus [ʒ], and finally [ʌ] versus [ʒ]. While this breaks up the data a bit and may serve as a limitation, it was hypothesized that factors that predict [j] realizations might differ from those that favor [ʃ] or [ʌ] realizations, which would be missed by including all of these variants into one analysis.

#### **5.1.2.2 Mixed-effects logistic regression of [j] versus [ʒ]**

There was a total of 608 [j] and 8,015 [ʒ] realizations included in this analysis. The mixed-effects logistic regression presents the estimate, the standard error (*SE*), *z*-value, percent of [j] realizations per level, total tokens of /ʒ/ per level, and *p*-values. The model is in reference to [j] realizations, thus positive estimates indicate that the listed predictor favors [j], while negative estimates disfavor [j]. Marginal R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et al., 2018). The best mixed-effects logistic regression for [j] and [ʒ] is presented in Table 11.

**Table 11**

*Summary of Mixed-effects Logistic Regression for [j] Versus [ʒ] Variation, in Reference to [j] Realizations, Speaker as a Random Factor,  $n = 8,623$  ( $R2m: 0.18$ ,  $R2c: 0.64$ )*

Predictors	Estimate	SE	z-value	% [j]	Total tokens	p-value
(Intercept)	-1.84	0.63	-2.93	---	---	< 0.001
Style (Ref = A)	---	---	---	10.7	4131	---
B	-1.90	0.16	-11.67	3.14	1944	< 0.001
C	-2.10	0.18	-11.38	3.05	1573	< 0.001
D	-1.19	0.18	-6.67	5.64	975	< 0.001
Education (Ref = 1)	---	---	---	18.18	1705	---
2	-1.55	0.77	-2.01	6.02	3403	< 0.05
3	-2.41	0.79	-3.05	2.65	3515	< 0.01
Syllabic Stress (Ref = Atonic)	---	---	---	6.6	4148	---
Tonic	-0.37	0.11	-3.51	7.5	4475	< 0.001

The main effect of style indicated that Style A (spontaneous speech) most favored [j] realizations, followed by Style D (picture task) and that Styles B (passage reading) and C (word list) least favored [j] as seen in Figure 35. A post-hoc analysis of the estimated marginal means indicates that all Styles were significant different from one another (all at  $p < 0.001$ ), except for Styles B and C ( $p = 0.79$ ). The main effect of education indicates that those with no/primary education were most likely to favor [j] realizations followed by those with secondary and university education as seen in Figure 35. A post-hoc analysis indicates that speakers with no/primary education had significantly higher [j] realizations than those with university education ( $p < 0.001$ ),

but no significant differences between those with secondary education ( $p = 0.11$ ) no other differences were significant; nor were there significant differences between those with secondary and university education ( $p = 0.41$ ). Finally, the main effect of syllabic stress indicates that atonic syllables favored [j] more than tonic syllables. This main effect is not visualized below as the figure does not fully capture the main effect (this most likely due to the fact that this is a product of a mixed effect regression, taking into consideration the other fixed effects as well as the random effect).

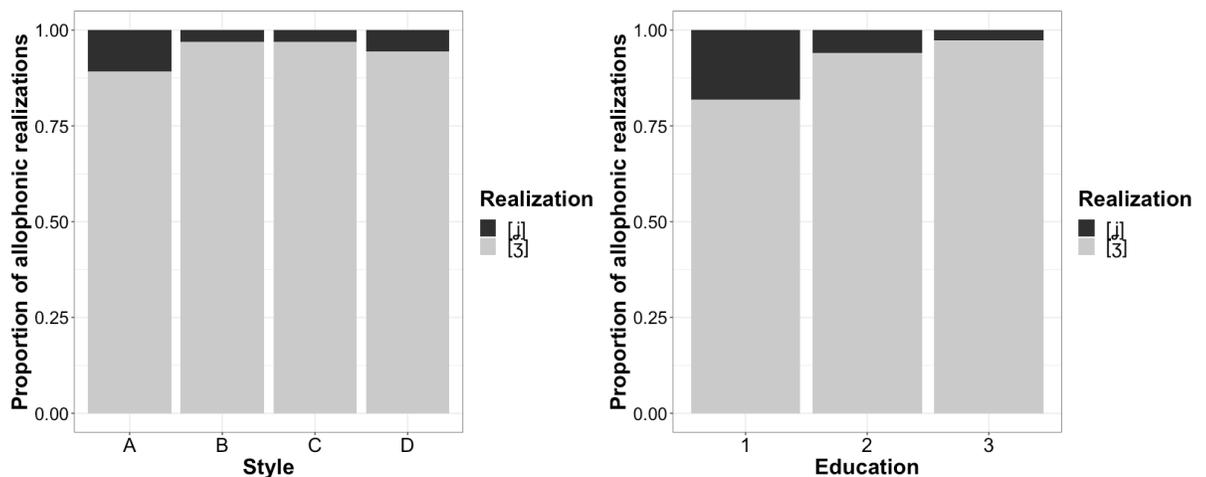


Figure 35. Left: Main effect of style for /z/ realizations; Right: Main effect of education for /z/ realizations.

### 5.1.2.3 Mixed-effects logistic regression of [j] versus [ʒ]

There was a total of 1,750 [j] and 8,015 [ʒ] realizations included in this analysis. The mixed-effects logistic regression presents the estimate, the standard error (*SE*), z-value, percent of [j] realizations per level, total tokens of /z/ per level, and *p*-values. The model is in reference to [j] realizations, thus positive estimates indicate that the listed predictor favors [j], while negative estimates disfavor [j]. Marginal R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model

(Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et al., 2018). The best mixed-effects logistic regression for [ʃ] versus [ʒ] is presented in Table 12.

**Table 12**

*Summary of Mixed-effects Logistic Regression for [ʃ] Versus [ʒ] Variation, in Reference to [ʃ] Realizations, Speaker as a Random Factor,  $n = 9,765$  ( $R2m: 0.25$ ,  $R2c: 0.61$ )*

Predictors	Estimate	SE	z-value	% [ʃ]	Total tokens	p-value
(Intercept)	-2.35	0.34	-5.34	---	---	< 0.001
Gender (Ref = Female)	---	---	---	29.2	5427	---
Male	-2.76	0.40	-6.91	3.8	4338	< 0.001
Neighborhood (Ref = Medium)	---	---	---	13.3	3472	---
High	1.15	0.52	2.23	25.3	4106	< 0.05
Low	0.46	0.56	0.82	11.4	2187	0.41
Style (Ref = A)	---	---	---	18.7	4378	---
B	-0.19	0.09	-2.05	16.4	2253	< 0.05
C	0.26	0.10	2.56	20.6	1920	< 0.05
D	0.59	0.11	5.40	24.2	1214	< 0.001
Position in Word (Ref = Initial)	---	---	---	16.0	3772	---
Mid	0.24	0.08	3.16	19.1	5993	< 0.01

The main effect of gender indicates that women favor [ʃ] more than men as seen in Figure 36. The main effect of neighborhood indicates that those from upper-middle/upper-class neighborhoods favor [ʃ] more than those from middle-class and

lower-class neighborhoods as seen in Figure 36. A post-hoc analysis of the estimated marginal means indicates that none of the differences were statistically significant (this most likely a result of averaging over gender, style, and position). The main effect of style seen in Figure 37 indicates that Style D (picture task) most favored [ʃ], followed by Style C (word list) and then Styles A and B. A post-hoc analysis revealed that all styles were significantly different from one another except A and B ( $p = 0.17$ ) and A and C ( $p = 0.052$ ). Finally, the main effect of position in word revealed that the word-internal position favored [ʃ] more than word-initial position as seen in Figure 37.

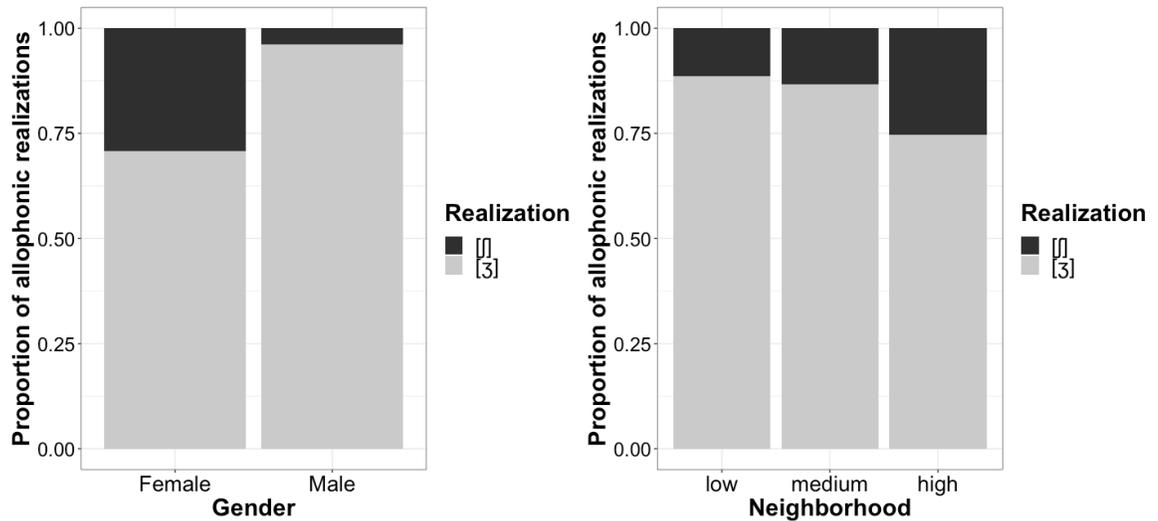


Figure 36. Left: Main effect of gender for /ʒ/ realization; Right: Main effect of neighborhood for /ʒ/ realization.

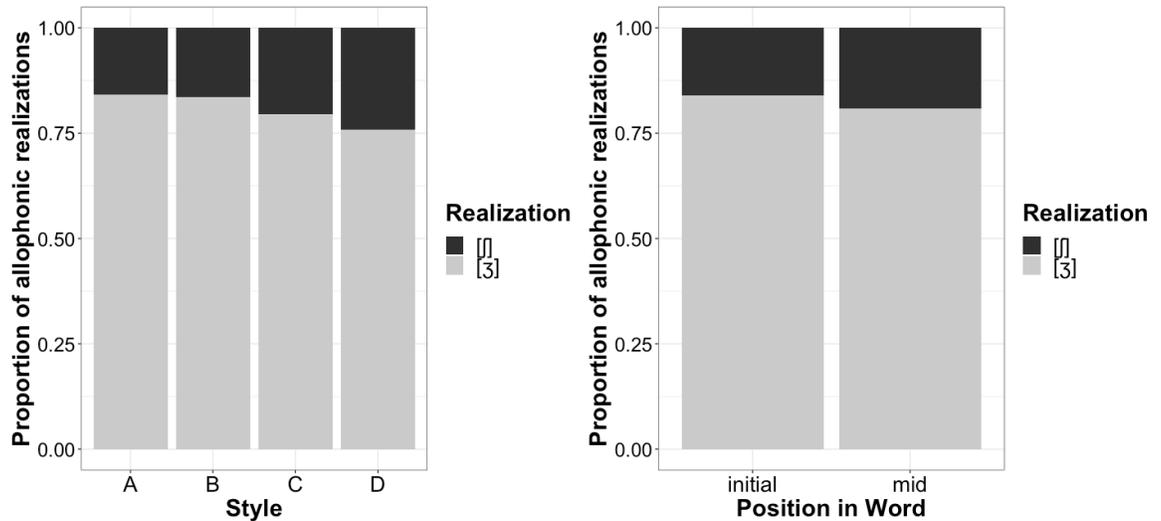


Figure 37. Left: Main effect of style for /z/ realization; Right: Main effect of position in word for /z/ realization.

Originally a neighborhood by gender interaction was tested in the model above. This resulted in the model not converging. Thus, the relationship between gender and neighborhood was explored further in a conditional inference tree as seen in Figure 38. As one observes, the tree separates men and women. For the women, those who are from higher socioeconomic neighborhoods demonstrates much higher levels of [ʒ] realizations than those from lower- and middle-class neighborhoods. For the men, overall there are very low levels of [ʒ] realizations, with men from middle class demonstrating the most [ʒ] realizations, followed by men from lower class neighborhoods.

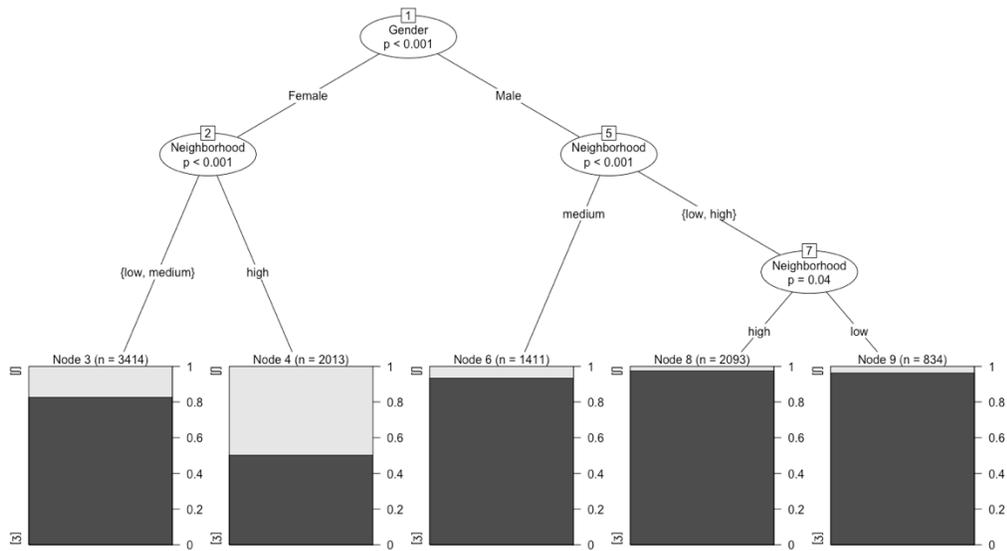


Figure 38. Conditional inference tree of gender and neighborhood that predict /z/ realizations ([j] = light gray; [z] = dark gray).

Given the importance of gender by neighborhood, this interaction was explored further in follow-up models. In model exploration it was found if Style was taken out, this allowed for the model to converge with a significant gender by neighborhood interaction (see Table 13).

**Table 13**

*Summary of Mixed-effects Logistic Regression for [j] Versus [z] Variation, in Reference to [j] Realizations, Speaker as a Random Factor, n = 9,765 (R2m: 0.31, R2c: 0.61)*

Predictors	Estimate	SE	z-value	% [j]	Total tokens	p-value
(Intercept)	-0.44	0.36	-1.23	---	---	0.22
Gender (Ref = Female)	---	---	---	29.2	5427	---
Male	-4.41	0.64	-6.87	3.8	4338	< 0.001
Neighborhood (Ref = High)	---	---	---	25.3	4106	---

**Table 13**, Continued

Low	-2.05	0.63	-3.25	11.4	2187	< 0.01
Med	-2.03	0.59	-3.44	15.31	3011	< 0.001
Position in Word (Ref = Initial)	----	----	----	16.0	3772	----
Mid	0.33	0.07	4.56	19.1	5993	< 0.001
Gender:Barrio (Ref = F:High)	----	----	----	49.43	2013	----
Male:Low	3.07	1.03	2.87	3.7	834	< 0.01
Male:Mid	2.25	0.99	2.27	6.5	1411	0.53

All independent variables were originally included in model construction, but non-significant main effects and interactions were removed from subsequent models. Thus, if an independent variable is not in the table, this indicates that it was not significant.

The main effect of gender indicates that women favor [f] more than men as seen in Figure 39. The main effect of neighborhood indicates that those from upper-middle/upper-class neighborhoods favor [f] more than those from middle-class and lower-class neighborhoods as seen in Figure 39. A post-hoc analysis of the estimated marginal means indicates that none of the differences were statistically significant (this most likely a result of averaging over gender, style, and position). The interaction between gender and neighborhood indicates that women from upper-class neighborhoods most favor [f] realizations as seen in Figure 40. A post-hoc analysis revealed that among women, those from upper-class neighborhoods produced significantly more [f] than those from middle-class ( $p < 0.01$ ) or lower-class

neighborhoods ( $p < 0.01$ ), but that there were no differences between speakers from middle-class or lower-class neighborhoods ( $p = 0.9995$ ). Among men, there were no statistically significant differences based on neighborhood. Among speakers from upper-class neighborhoods, women produced more [ʃ] than men ( $p < 0.001$ ). Among speakers from middle-class neighborhoods, women produced more [ʃ] than men ( $p < 0.01$ ). Among speakers from lower-class neighborhoods, there were no statistically significant differences between men and women ( $p = 0.053$ ). Finally, the main effect of position in word revealed that the word-internal position favored [ʃ] more than word-initial position as seen in Figure 40.

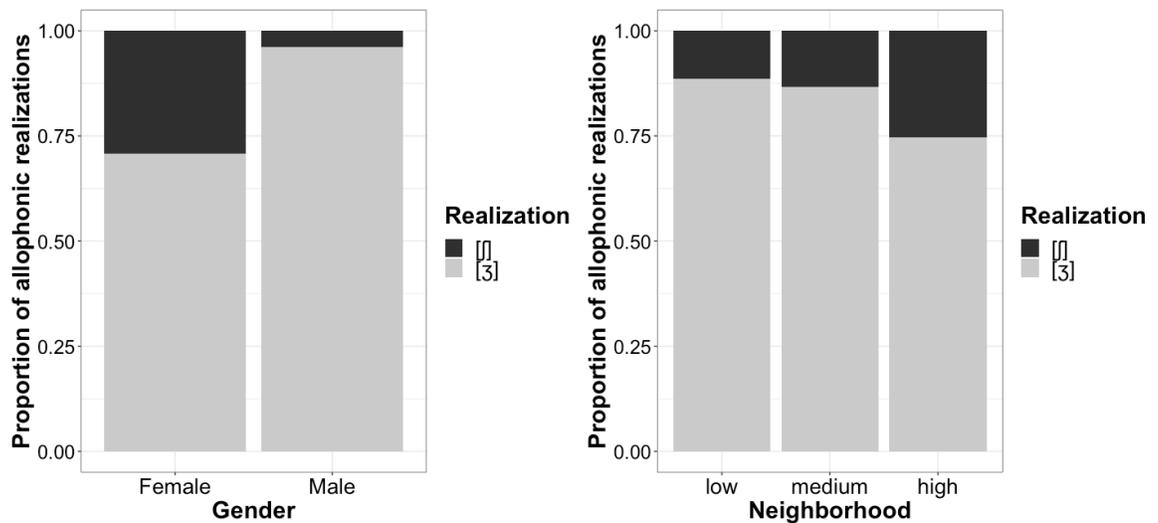


Figure 39. Left: Main effect of gender for /ʒ/ realization; Right: Main effect of neighborhood for /ʒ/ realization.

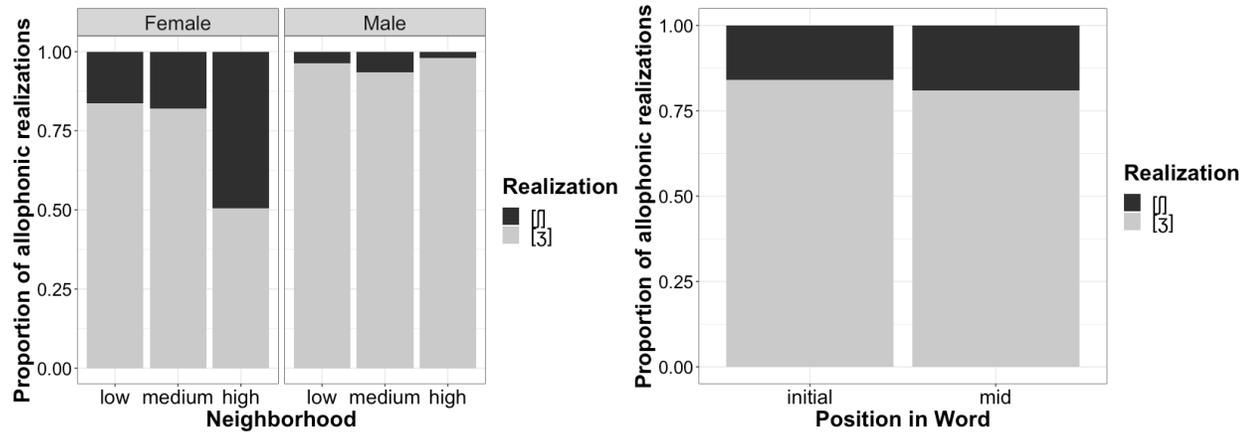


Figure 40. Left: Gender by neighborhood interaction for /ʒ/ realizations; Right: Main effect of position in word for /ʒ/ realizations.

#### 5.1.2.4 Mixed-effects logistic regression of /ʌ/ versus [ʒ]

There was a total of 514 /ʌ/ and 8,015 [ʒ] realizations included in this analysis. The mixed-effects logistic regression presents the estimate, the standard error (*SE*), z-value, percent of [ʌ] realizations per level, total tokens of per level, and *p*-values. The model is in reference to [ʌ] realizations, thus positive estimates indicate that the listed predictor favors [ʌ], while negative estimates disfavor [ʌ]. Marginal R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginal means using the *emmeans()* package (Lenth et al., 2018). The best mixed-effects logistic regression for [ʌ] versus [ʒ] is presented in Table 14.

**Table 14**

*Summary of Mixed-effects Logistic Regression for [ʌ] Versus [ɜ] Variation, in Reference to [ʌ] Realizations, Speaker as a Random Factor,  $n = 8,529$  ( $R2m: 0.72$ ,  $R2c: 0.91$ )*

Predictors	Estimate	SE	z-value	% [ʌ]	Total tokens	p-value
(Intercept)	-9.11	1.13	-8.06	---	---	< 0.001
Style (Ref = A)	---	---	---	0.03	3688	---
B	3.96	1.06	3.72	1.57	1913	< 0.001
C	8.65	1.06	8.15	22.31	1963	< 0.001
D	5.41	1.07	5.06	4.66	965	< 0.001
Orthography (Ref = <ll>)	---	---	---	11.77	4351	---
<y>	-6.71	0.73	-9.15	0.05	4178	< 0.001
AgeGroup (Ref = Adult)	---	---	---	5.91	5529	---
Senior	0.96	1.01	0.95	9.17	1178	0.34
Young	-3.17	0.68	-4.65	4.34	1822	< 0.001

The main effect of Style indicates that Style C (word list) most favored /ʌ/, followed by Style D (picture task), Style B (passage reading), and then Style A (spontaneous speech) least favored /ʌ/ realizations as seen in Figure 41. A post-hoc analysis of the estimated marginal means indicates that all styles differed significantly from all other styles ( $p < 0.001$  for all comparisons except Style A and B:  $p < 0.01$ ). The main effect of orthography demonstrates that /ʌ/ was favored with orthography <ll> as seen in Figure 41. The main effect of age group indicates that senior speakers favored /ʌ/ more than adult speakers and younger speakers as seen in Figure 42. A post-hoc analysis of the main effect of age found that the oldest speakers produced significantly more /ʌ/ than younger speakers ( $p < 0.001$ ), but no difference between

seniors and adults ( $p = 0.61$ ). Adults produced more /k/ than younger speakers ( $p < 0.001$ ).

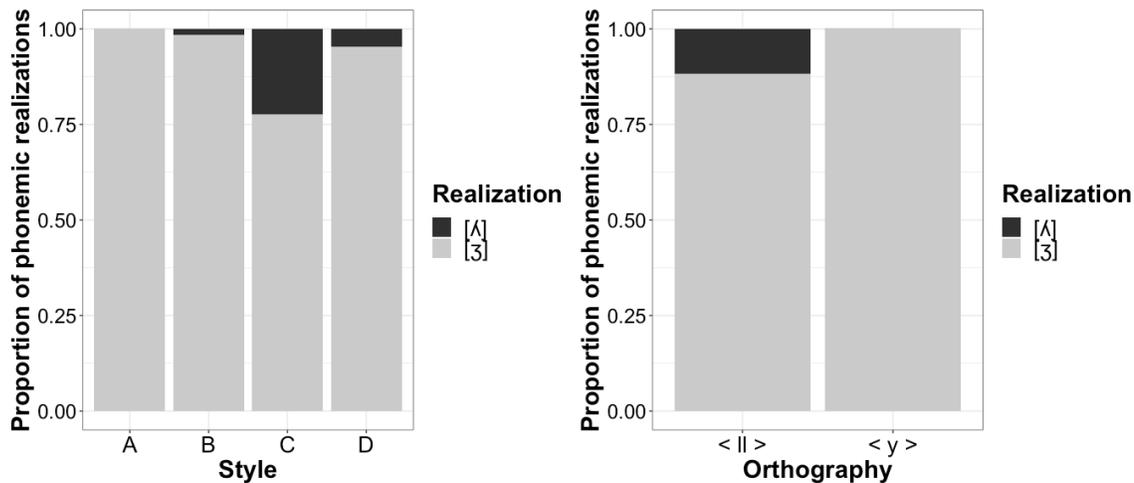


Figure 41. Left: Main effect of style for /k/ versus /3/ realizations; Right: Main effect of orthography for /k/ versus /3/ realizations.

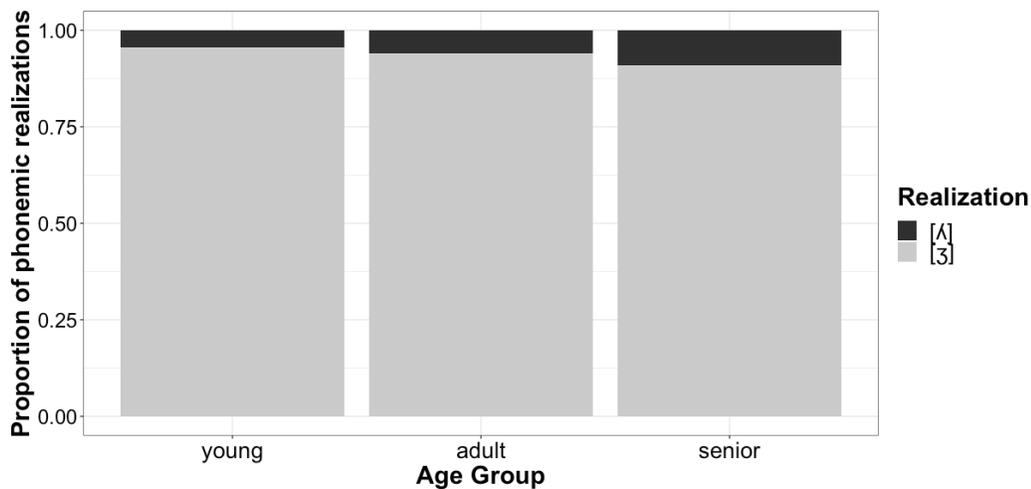


Figure 42. Main effect of age group for /k/ versus /3/ realizations.

## 5.2 Acoustic analysis

### 5.2.1 Mixed-effects linear regression: [j] vs. [ʒ]

Prior to any statistical analyses, the data was subject to data visualization based on realization ([j] vs. [ʒ]) with several dependent measures (duration (ms), normalized zero crossings, mean intensity (dB), center of gravity (Hz), variance (Hz), skewness, kurtosis) in order to assess if these acoustic measures demonstrated differences between the two variants. While previous studies have found normalized zero crossings to be an effective acoustic measure (von Essen, 2015, 2020), it was found in the data the even with normalization the zero crossings there was still a major effect of biologically-related sex effects differences in which overall women had higher zero crossings than men for both variants. Additionally, the zero crossings of the older women's data were quite skewed, as seen in Figure 43, and thus this acoustic measure could not be used in the current study as reliable parameter to distinguish [j] from [ʒ] taking into consideration all the social factors.

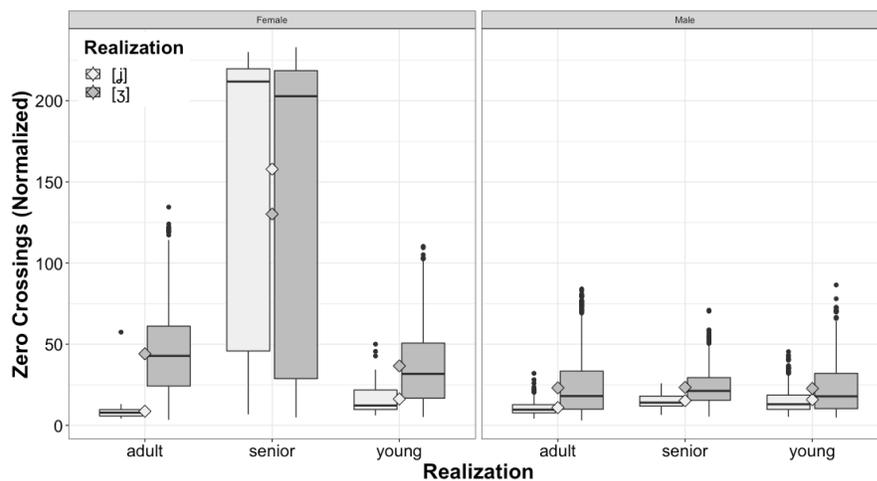


Figure 43. Realization ([j], [ʒ]) for normalized zero crossings by age and gender.

The most robust difference was found for mean intensity (dB), which is an amplitudinal parameter and as such does not demonstrate any biological-sex related differences between men and women. [j] realizations had higher mean intensity ( $M: 60.1, SD: 8.8$ ) than [ʒ] realizations ( $M: 55.1, SD: 8.2$ ),  $t(688,5) = 13.62, p < 0.001$  (see Figure 44). Given this is a raw measure of mean intensity, this is also a limitation. A more ideal measure would have been a relative measure such as Intensity Difference (*IntDiff*) (Hualde et al., 2011), but raw mean intensity at least provides a comparison between allophonic realizations in which the more approximant-like [j] realizations will have higher mean intensity than the more fricative-like [ʒ] realizations.

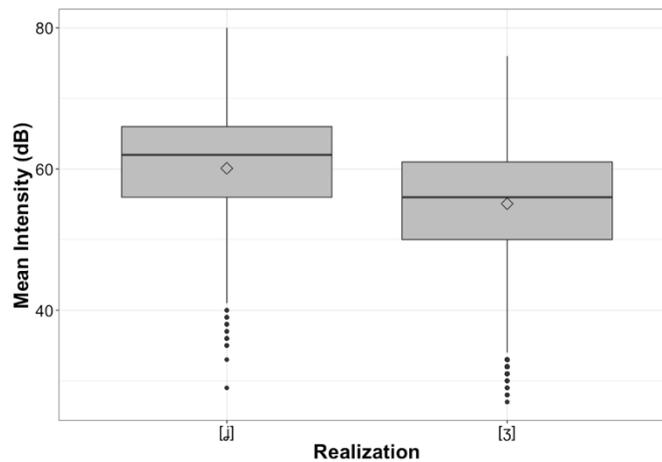


Figure 44. Realization ([j], [ʒ]) for mean intensity (dB).

The mixed-effects linear regression presents the estimate, the standard error (*SE*), *t*-value, and *p*-values. Marginal R-squared ( $R^2m$ ) and conditional R-squared ( $R^2c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a

post-hoc analysis was conducted of the estimated marginals means using the *emmeans()* package (Lenth et al., 2018). The best mixed-effects linear regression for duration is presented in Table 15. In very general terms, a higher intensity (dB) should be interpreted as more approximant-like [j] realizations while lower mean intensity (dB) should be interpreted as more fricative-like [ʒ] realizations.

**Table 15**

*Summary of Mixed-effects Linear Regression for [j]/[ʒ] Variation for Mean Intensity (dB), Speaker as a Random Factor, n = 8,623 (R2m: 0.21, R2c: 0.76)*

Predictors	Estimate	SE	t-value	p-value
(Intercept)	51.70	3.1	16.7	< 0.001
Salary (Ref = high)	---	---	---	---
Low	-0.47	2.7	-0.18	0.86
	-2.77	2.74	-1.01	0.32
Medium				
Gender (Ref = Female)	---	---	---	---
Male	-0.12	2.64	-0.05	0.96
Education (Ref = 1)	---	---	---	---
2	0.40	2.38	0.17	0.87
3	5.67	2.69	2.11	< 0.05
Style (Ref = A)	---	---	---	---
B	-1.25	0.12	-10.1	< 0.001
C	-1.13	0.14	-8.1	< 0.001
D	-1.59	0.16	-9.84	< 0.001
Position in Word (Ref = Initial)	---	---	---	---
Mid	0.92	0.11	8.08	< 0.001
Pause (Ref = No)	---	---	---	---
Yes	-1.04	0.19	-5.41	< 0.001

**Table 15**, Continued

Orthography (Ref = <ll>)	---	---	---	---
<y>	0.25	0.10	2.52	< 0.05
Salary:Gender (Ref = High: Fe)	---	---	---	---
Low:Male	11.42	2.85	4.0	< 0.001
Mid:Male	4.45	4.52	0.99	0.33

The main effect of Education indicates that those with primary education had the highest mean intensity (dB), followed by those with university education and then secondary education as seen in Figure 45. However, a post-hoc analysis found that the only significant difference was that those with university education had significantly higher mean intensity (dB) than those with secondary education ( $p < 0.05$ ), while those with primary education did not differ from those with secondary ( $p = 0.985$ ) nor those with university education ( $p = 0.088$ ). The main effect of Style indicates that Style A had the highest mean intensity (dB), followed by Styles C and B, and then final Style D as seen in Figure 46. A post-hoc analysis found that all styles were significantly different from one another ( $p < 0.01$ ) with the exception of Style B and Style C ( $p = 0.793$ ). The main effect of position in the word demonstrates a higher mean intensity (dB) in word-medial position versus word-initial position as seen in Figure 46. The main effect of pause indicates that tokens not after a pause demonstrate higher mean intensity (dB) than those after a pause as seen in Figure 47. The main effect of orthography demonstrates that orthography <y> demonstrates higher mean intensity (dB) than orthographic <ll> as seen in Figure 47. Finally, regarding the

gender by salary interaction as seen in Figure 48, a post-hoc analysis revealed that among women, there were no statistically significant differences between different salaries. However, among men, those with lower salaries had significantly higher mean intensity than those with high salaries ( $p < 0.001$ ) and those with medium salaries ( $p < 0.05$ ), but those with medium and high salaries did not differ from one another ( $p = 0.889$ ). Comparing salaries across gender, there were no significant differences between men and women among high salary speakers ( $p = 0.964$ ) nor among medium salary speakers ( $p = 0.245$ ). However, among low salaries speakers, men had significantly higher mean intensity (dB) than women ( $p < 0.001$ ).

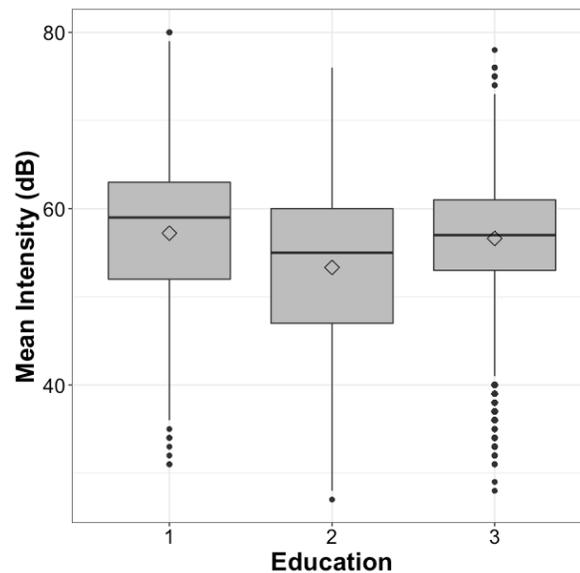


Figure 45. Main effect of education mean intensity (dB).

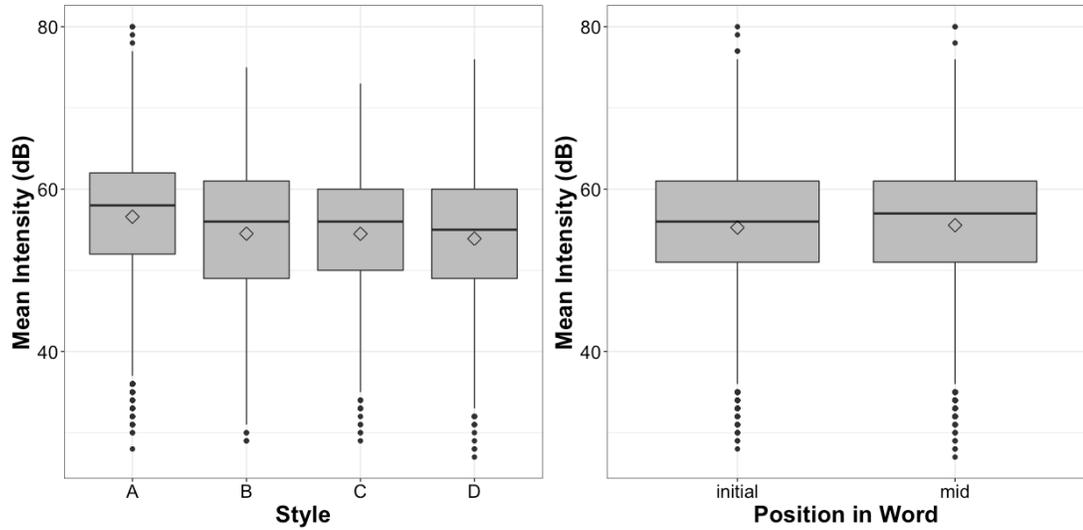


Figure 46. Left: Main effect of style for mean intensity (dB); Right: Main effect of position in word mean intensity (dB).

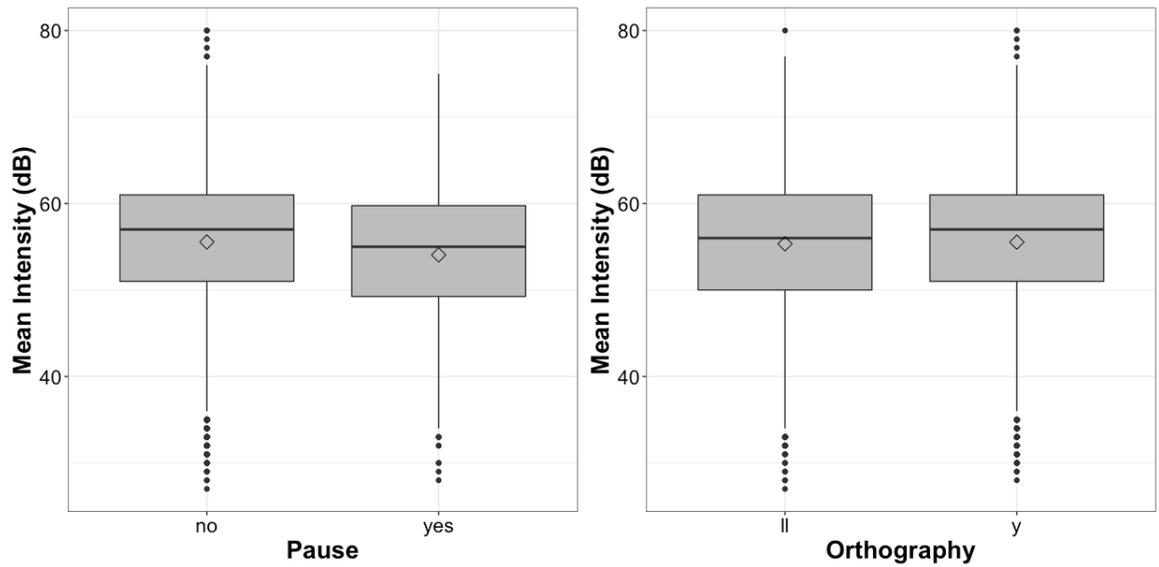


Figure 47. Left: Main effect of pause for mean intensity (dB); Right: Main effect of orthography mean intensity (dB).

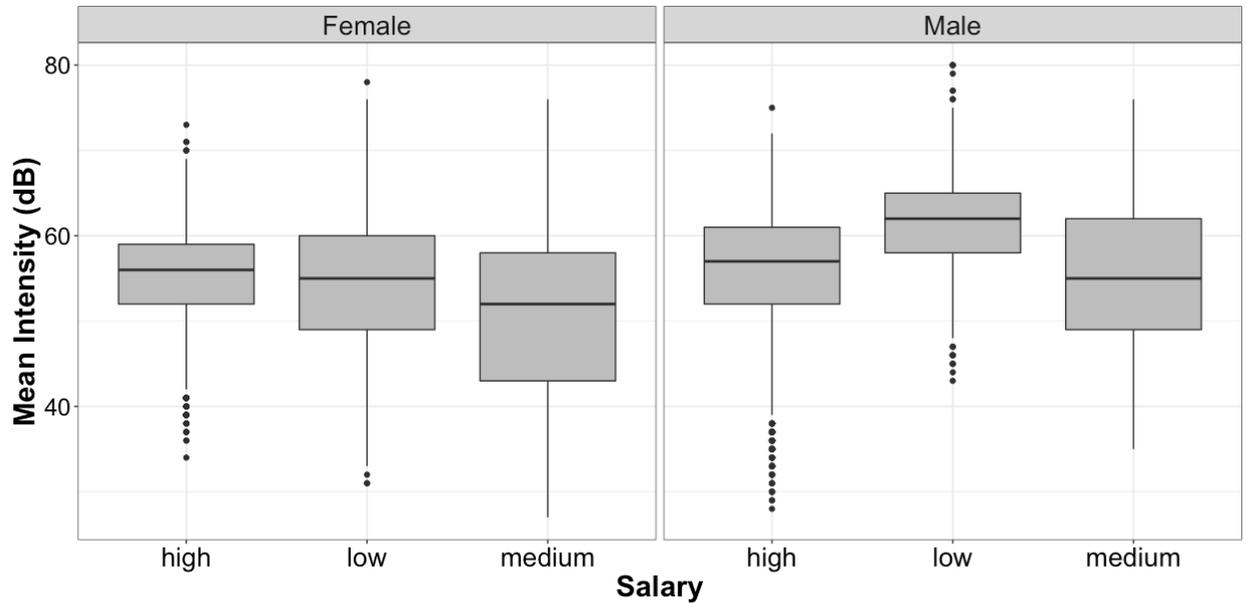


Figure 48. Salary by gender interaction for mean intensity (dB).

### 5.2.1 Mixed-effects linear regression: [ʃ] vs. [ʒ]

Prior to any statistical analyses, the data was subject to data visualization based on realization ([ʃ] vs. [ʒ]) with several dependent measures (duration (ms), normalized zero crossings, mean intensity (dB), center of gravity (Hz), variance (Hz), skewness, kurtosis) in order to assess if these acoustic measures demonstrated differences between the two variants. The most robust differences were found for duration (ms) and normalized zero crossings. [ʃ] realizations had longer duration ( $M: 101.2, SD: 32.03$ ) than [ʒ] realizations ( $M: 72.3, SD: 23.19$ ),  $t(2165.8) = 35.7, p < 0.001$  (Figure 5.20). Also, [ʃ] realizations had significantly more zero crossings ( $M: 81.57, SD: 38.35$ ) than [ʒ] realizations ( $M: 37.70, SD: 39.80$ ),  $t(2634.3) = 43.06, p < 0.001$  (Figure 49).

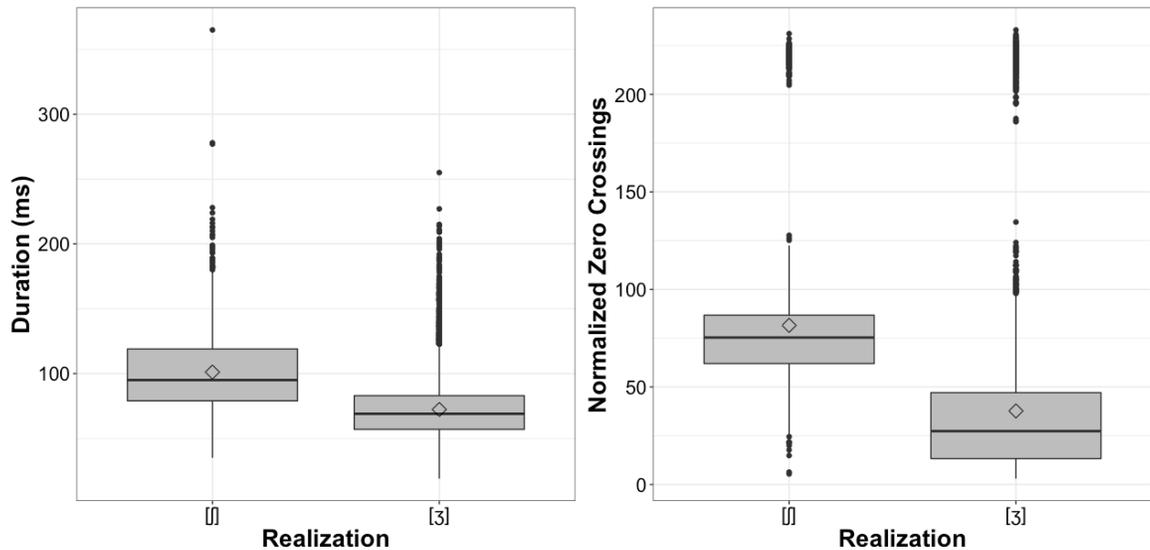


Figure 49. Left: Realization ([j], [ʒ]) for duration (ms); Right: Realization ([j], [ʒ]) for normalized zero crossings.

Additionally, these were examined as related to gender, in order to see if there were any biological sex-related effects that would skew any results. Following data visualization, it was found that duration (ms) demonstrated that [j] realizations had longer duration (ms) than [ʒ] realizations per both men and women (Figure 50). Similarly, both women and men had more zero crossings (normalized) for [j] realizations than [ʒ] realizations (Figure 5.21). However, even though it is normalized, one observes that there is still a strong effect due to biological-sex related differences of differences in vocal tract sizes which affects spectral parameters (i.e., COG, variance, zero crossings) in which women demonstrate higher zero crossings than men for both realizations. Thus, there is too much overlap in zero crossings between women's [ʒ] realizations and men's [j] realizations for this to be a reliable acoustic cue in a linear regression. Furthermore, similar to the [j] versus [ʒ] data analysis above, the oldest women again demonstrated incredibly high zero crossings which

would skew the data. For these reasons, only the acoustic parameter of duration (ms) will be analyzed here.

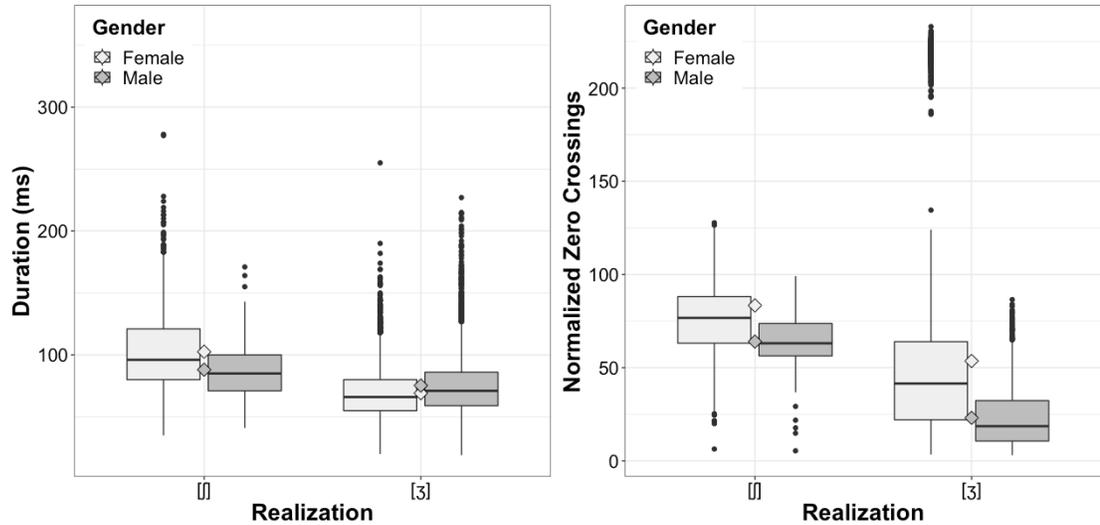


Figure 50. Left: Realization ([ʃ], [ʒ]) by gender for duration (ms); Right: Realization ([ʃ], [ʒ]) by gender normalized zero crossings.

The mixed-effects linear regression presents the estimate, the standard error (*SE*), *t*-value, and *p*-values. Marginal R-squared ( $R^2_m$ ) and conditional R-squared ( $R^2_c$ ) values are listed for the model (Nakagawa & Schielzeth, 2013). Reference levels are displayed in the table. For any independent variables with more than two levels, a post-hoc analysis was conducted of the estimated marginals means using the *emmeans()* package (Lenth et al., 2018). The best mixed-effects linear regression for duration is presented in Table 16. In general terms, a longer duration (ms) should be interpreted as a more [ʃ]-like realization while shorter duration (ms) should be interpreted as a more [ʒ]-like realization.

**Table 16**

*Summary of Mixed-effects Linear Regression for [j]/[ʒ] Variation for Duration (ms), Speaker as a Random Factor, n = 9,765 (R2m: 0.20, R2c: 0.41)*

Predictors	Estimate	SE	t-value	p-value
(Intercept)	79.91	2.85	28.02	< 0.001
Style (Ref = A)	---	---	---	---
B	2.78	0.57	4.83	< 0.001
C	24.23	0.64	38.0	< 0.001
D	10.38	0.73	14.3	< 0.001
Neighborhood (Ref = High)	---	---	---	---
Low	-18.85	4.91	-3.84	< 0.001
Medium	-16.85	4.61	-3.65	< 0.001
Gender (Ref = Female)	---	---	---	---
Male	-11.31	4.74	-2.39	< 0.05
Position in Word (Ref = Initial)	---	---	---	---
Mid	4.56	0.53	8.59	< 0.001
Pause (Ref = No)	---	---	---	---
Yes	6.98	0.85	8.17	< 0.001
Orthography (Ref = <ll>)	---	---	---	---
<y>	-1.93	0.45	-4.25	< 0.001
Neighborhood:Gender (Ref = High: Fe)	---	---	---	---
Low:Male	14.05	7.78	1.80	0.076
Mid:Male	13.68	7.33	1.87	0.067

The main effect of Style indicated that Style C (word list) has the highest duration, followed by Style D (picture task), then Style B (passage reading), and finally Style A (spontaneous speech) as seen in Figure 51. A post-hoc analysis of the

estimated marginal means indicates that all styles differed significantly from all other styles ( $p < 0.001$ ). The main effect of neighborhood indicates that those from upper-class neighborhoods have the highest duration (ms), followed by those in middle class neighborhoods, and then lower-class neighborhoods as seen in Figure 51. A post-hoc analysis of the estimated marginal means indicates that speakers from upper-class neighborhoods have statistically significant longer duration (ms) than those from middle-class neighborhoods ( $p < 0.05$ ) and those from lower-class neighborhoods ( $p < 0.001$ ). There were no significant differences between those from middle- and lower-class neighborhoods ( $p = 0.885$ ). Regarding gender, overall women have a longer duration (ms) than men in the regression model (see Figure 52). The main effect of position in word demonstrates that tokens in word-medial position were statistically longer (ms) than those in word-initial position as seen in Figure 52. The main effect of pause indicates that fricative tokens after a pause had significantly longer duration (ms) than tokens not after a pause as seen in Figure 53. The main effect of orthography indicates that orthographic <ll> had significantly longer duration (ms) than orthographic <y> tokens as seen in Figure 53.

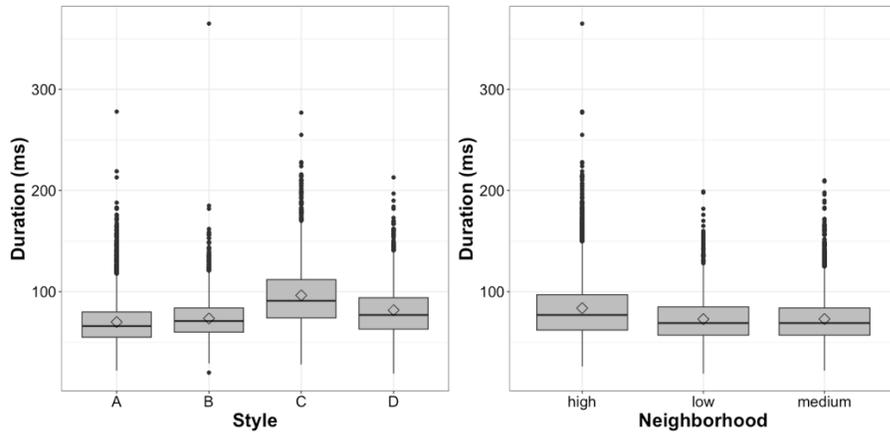


Figure 51. Left: Main effect of style for duration (ms); Right: Main effect of neighborhood for duration (ms).

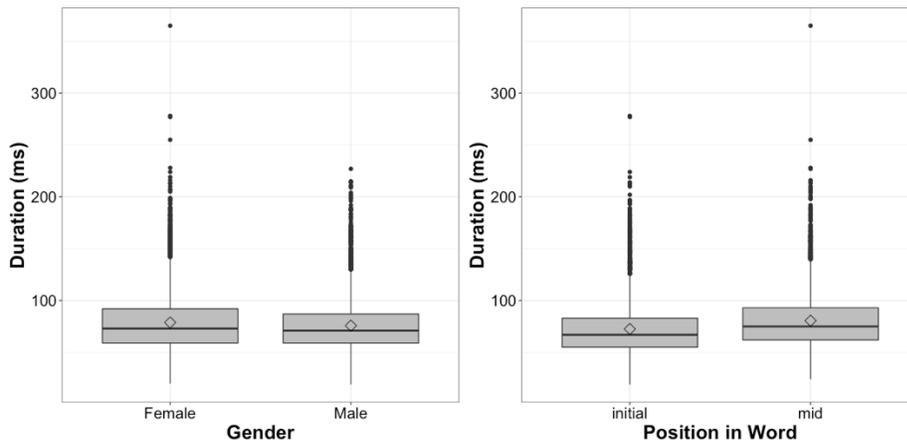


Figure 52. Left: Main effect of gender for duration (ms); Right: Main effect of position in word for duration (ms).

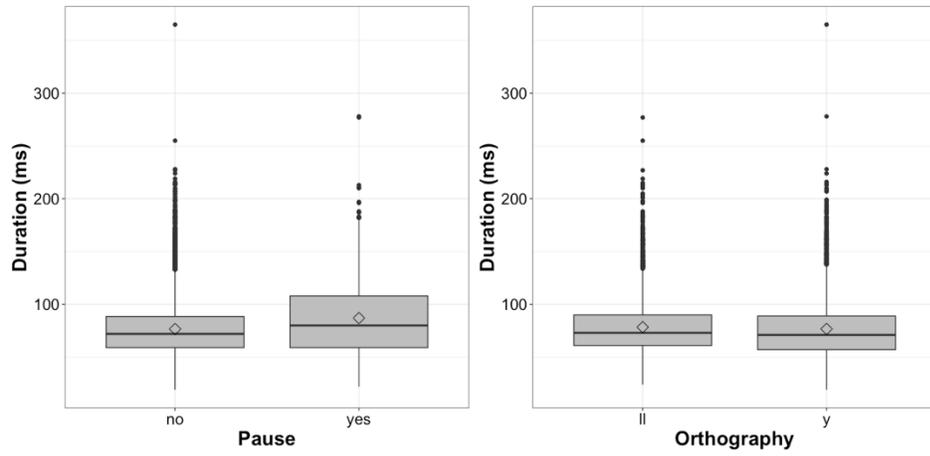


Figure 53. Left: Main effect of pause for duration (ms); Right: Main effect of position in word for duration (ms).

## CHAPTER 6

### DISCUSSION OF RESULTS

This dissertation had the primary intent of exploring the present state of *yeísmo* in areas of Argentina that remain understudied given the main interest on the rapid changes that have occurred in Buenos Aires. Specifically, the project was designed to address the current status of this phenomenon in the city of Córdoba and provide information on the social and linguistic aspects that appear to govern the use of different variants of *yeísmo* in this area in central Argentina.

In this section, I will address the research questions that guided this work followed by a discussion of how the results of the analysis align with the proposed hypotheses. This chapter will close with concluding remarks including contributions to the field, limitations of the present work, and recommendations for future research efforts.

#### 6.1 Discussion of Research questions

Based on the segmental and acoustic analysis of the data presented in Chapter 5, which show that the voiced palatal fricative /j/ displays a gradient range of allophonic variation within a constriction continuum, this section addresses the hypotheses proposed for the research questions and construes the significance of the results in light of theoretical frameworks within which this work was formulated.

### 6.1.1 Frequency of use of [j], [ʒ], [dʒ], [ʃ], and [ʎ]

**RQ1:** What is the overall frequency of [j], [ʒ], [dʒ], and [ʃ] in the speech community of Córdoba?

It was hypothesized that the voiced palatal fricative [ʒ] would represent a significant percentage in patterns of frequency of use, as has been found in the most recent studies on *yeísmo* in Argentina that compare Córdoba and other provinces to the patterns of the capital. Descriptive statistics support this hypothesis showing that the growing tendency toward [ʒ] in the last five decades continues forward steadily. The dominant norm was found to be [ʒ]/[dʒ] for all speakers. Patterns found in previous research showed a transition of the fricative palatal [j] as the prestige form of the upper classes in the 19<sup>th</sup> century (Prevedello, 1991); to an alternation between this variant and the strengthened prepalatal fricative [ʒ] in the 1960s, with [j] maintaining a prestige status (Vidal de Battini, 1964); to a shift toward a preference for [ʒ] among middle and upper classes, while [j] was still identified even among this latter pool of participants but in much smaller percentages (Supisiche, 1994). The categorical representation of *yeísmo* in Córdoba at the time of data collection in the late 1980s (Supisiche, 1994), limited the description only to cases of [ʒ] and of [j], specifically indicating that no cases of the devoiced variant [ʃ] had been identified whatsoever. In the same manner, no cases of the affricate variant [dʒ] were reported. For comparison purposes, Table 6.1 shows percentages in data collected in Supisiche (1994) between 1989-1994 correlated with social class determined by level of education using the same criteria used in this work, with data collected in the present study with data from 2019 by level of education, one of the markers of socioeconomic stratification in

Córdoba as seen in Table 17 and Table 18. As can be seen from the comparative tables, the frequency of [ʒ] has increased from 44.66% in 1989-1994 to 61.57% in 2019, or 77.91% if we combine the percentage of [ʒ] with that of [dʒ]. The frequency of [j] has drastically decreased from 45.66% to 4.65%. Not found and therefore not reported in Supisiche (1994) are the frequency percentages of the affricate, devoiced, and lateral variants.

**Table 17**

*Percentage of Frequency of Use of the Two Variants Reported in Data Collected Between 1989-1994 (Supisiche, 1994)*

Class	%[j]	%[ʒ]	%Alternation [ʒ]-[j]
Low	100	0	0
Middle	13	76	11
Upper	21	61	18
<b>Totals</b>	<b>45.66</b>	<b>44.66</b>	<b>9.66</b>

**Table 18.**

*Percentage of Frequency of Use of the Five Variants Found in the Data for Córdoba by Education in Current Study (data collected in 2019)*

Education	%[j]	%[ʒ]	%[dʒ]	%[ʃ]	%[ʎ]
Low	2.38	10.71	2.64	1.67	.71
Mid	1.57	24.57	6.73	8.82	1.23
High	.7	26.29	6.96	13.43	2.0
<b>Totals</b>	<b>4.65</b>	<b>61.57</b>	<b>16.34</b>	<b>13.43</b>	<b>3.93</b>

Speakers in the present study gravitated either toward alternation between [ʒ]/[dʒ] and the less constricted variant [j], or between [ʒ]/[dʒ] and the most constricted variant [ʃ]. The advancement of more constricted and assimilated variants mirroring trends from Buenos Aires has been reported in more recent findings, in

which assibilation of palatals was detected in correlation to proximity to Buenos Aires, among other factors of linguistic nature (Colantoni, 2001, 2006a). In the city of Córdoba specifically, the majority of the tokens analyzed in Colantoni (2001) were identified as [ʒ] at 90%, with the remaining 10% corresponding in decreasing order to the affricate variant [dʒ], the devoiced palatal fricative [ʃ], and the voiced palatal fricative [j] respectively, as seen in Figure 54. The present study results report higher frequency percentages of the affricate [dʒ] and devoiced [ʃ] variants at 16.34% and 13.43% respectively, while the palatal fricative [j] represents 8.57% of the analyzed tokens.

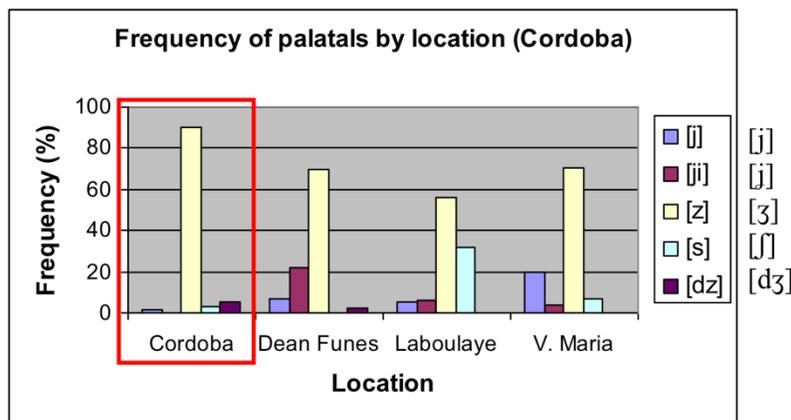


Figure 54. Percentage of frequency of allophones of [j] reported in Colantoni (2001, p. 173).

Lang-Rigal (2015b), reports that Córdoba shows a mean percentage of [ʒ] voicing of 88.927% as seen in Figure 55. The remaining 11.073% attributed to devoicing, while higher than results in Colantoni (2001), is slightly lower than the percentage found in this study, suggesting that devoicing may be steadily gaining ground in Córdoba, but the higher percentage reported in this study could possibly be

a result of the larger number of participants and tokens analyzed. In either case, previous studies show a slower rate of the advancement of devoicing than in other regions such as Tucumán (Lang-Rigal, 2015b); Corrientes, San Juan, and Entre Ríos (Colantoni, 2001); and Rosario and Tandil (Castellani, 1998).

Region	Log odds	Tokens (n)	Mean %
Buenos Aires	-21.824	121	46.242
Córdoba	20.947	126	88.927
Tucumán	0.876	159	67.655

*Figure 55.* Analysis of voicing percentage of [ʒ] in Córdoba (Lang-Rigal, 2015b, p. 153).

The hypotheses of RQ1, i.e. that Córdoba continues on a growing tendency to favor the strengthened voiced variant [ʒ] as the predominant variant over [j], and that occasional instances of the devoiced variant [j̥] would surface in the analysis are confirmed by these results. In the same manner, the frequency of the affricate variant [dʒ] continues on a growing trend associated principally with linguistic context in which the tokens occur. As was hypothesized, this variant emerged in the data although at higher proportions than was expected, representing 16.35% of the collected data, marking a sharp contrast with data from Supisiche (1994) in which no affricate variants were reported whatsoever.

Finally, the palatal lateral [ʎ] emerged in the analysis constituting 3.95% of the data and favored nearly exclusively by the more formal context involving a higher level of attention to speech, with virtually no instances identified in the spontaneous part of the interview.

## **6.1.2 RQ2: Social and linguistic factors governing the use of [j], [ʒ], [dʒ], [ʃ], and [ʎ]**

### **6.1.2.1 [ʒ] versus [dʒ]**

As no study known by the author has statistically reported instances of the affricate [dʒ] in Córdoba, the current study is only able to compare findings with results in previous studies on *yeísmo* which have reported the presence of [dʒ] in their results correlated largely to the following linguistic factors (Chang, 2008; Fernández Trinidad, 2010; Rohena-Madrado, 2015).

*Position in word, orthography, and type of word.* Instances of [dʒ] in contrast with [ʒ] in Córdoba were favored by word initial position (31.3%) as well as after pause (60.7%). Orthography demonstrated more frequency of [dʒ] for <y> (26.1%) than for <ll> (14.5%), and type of word as a mixed effect with pause also showed that frequent monosyllable words such as *yo* ‘I,’ and *ya* ‘already,’ tended to be articulated as affricate after a pause, with *yo* representing the higher percentage (71.3%). Thus, orthography and word type are not completely independent of one another, *yo* and *ya* with <y> were the most frequent words to have the affricate variant. While not directly associated with affrication but with the devoicing trend, Lang-Rigal’s (2015b) study reports similar results for *ya* in Córdoba, noting that this word showed lower means of voicing for women in Córdoba. It was suggested that this devoicing pattern could be interpreted as sound innovation as a result of a process of lexical diffusion (Bybee, 2002; Wang, 1969), that is, a sharp and sudden phonetic change observed at a

certain moment in time and only in some words. Other varieties of Spanish such as Peninsular Spanish also display this affricate variant in word and phrase initial position with words like *ya, yo* (Scarpace et al., 2015). This linguistic process merits further exploration using frameworks and experimental methodologies specifically designed for that purpose.

The significance of these linguistic factors in the articulation of [dʒ] in this work could lead to conclude that [ʒ] and [dʒ] are in complementary distribution in Córdoba, where one variant occurs in contexts where the other one normally would not. However, extralinguistic factors that were revealed in the analysis as significant predictors for [dʒ] may undermine such conclusion.

*Style.* The conclusion indicating complementary distribution was somehow debilitated by the emergence of extralinguistic factors as significant predictors as well, especially in light of the fact that the second largest percentage of tokens of [dʒ] was identified in Part A (spontaneous conversation, 21.3%) not far from Part C (reading of a word list, 27.5%). Parts A, B, C, and D of the Sociolinguistic interview range from more to less attention paid to speech in the following order:

<b>+ attention/careful</b>			<b>- attention/careful</b>
C <i>(Reading of word list)</i>	B <i>(reading of passage)</i>	D <i>(picture naming task)</i>	A <i>(spontaneous conversation)</i>

Results here show that the highest level of constricted affricate articulation was produced in the reading of a word list that implied a high level of attention to speech. This is not surprising if we consider that more constricted articulations in Argentina

have come to represent forms associated with prestige. The high percentage of occurrences of [dʒ] in spontaneous speech at the opposite end of the range, is a surprising result, as it was expected that less constricted variants would emerge when individuals were largely oblivious of the specific purpose of the conversation. However, the high frequency of words such as *yo* ‘I’ and *ya* ‘already’ in Part A, coupled with occurrences after a pause, may account for the high rates of the affricate variant in this style, as similarly seen in Lang-Rigal, 2014b. Style D accounted for 16.8% of the tokens. While not as formal a task as in style C, in this context participants focused on both identifying the image in the cards correctly while at the same time making an effort to use a more careful articulation in the form of higher levels of constriction. In addition, the speech produced during this task was in the form of single words or short phrases, leading to more tokens articulated in phrase initial position after a pause. Involving reading and thus more attention to speech, style B representing 16.2% of the tokens also elicited a tendency to produce speech at a slower rate which provided the conditions necessary for a more careful, constricted articulation associated with a prestige norm characteristic of an educated reader.

*Gender.* In agreement with Principle 2 of linguistic change (Labov, 2001, p. 266) which poses that in stable variation women consistently show higher rates of prestige variants than men, women produced [dʒ] more than men (26.2% vs. 15.4% respectively). This finding supports Hualde (2005, p.166) who expresses that this variant appears to be associated with social prestige in Argentina, and as such enjoys widespread status in some regions of the country. Córdoba appears to be a strong case of positive appraisal of [dʒ].

*Age.* Participants representing the older group led with 28.9%, followed by the adults with 20.3% and the young with 17.3%. This monotonic slope by age represents the standard pattern of what could be considered a change in progress in favor of [ʒ] (Tagliamonte, 2012, p. 45). However, given that this hypothesis would imply a weakening process instead of a strengthening one, the negative correlation with age merits further exploration in future research efforts. At present, this pattern found in Córdoba, where [ʒ] and [dʒ] show the highest frequency, is comparable to the trend described in studies of the evolution of devoicing in Buenos Aires (Zamora Vicente, 1940; Wolf & Jiménez, 1979; Wolf, 1984), where [dʒ] appeared to be serving as a strengthened transitional variant that eventually led to the devoiced [ʃ]. If we consider the time frame between which the palatals in Buenos Aires began the assibilation process in the 1940s that led to full devoicing, the evolution and completion of such phenomenon occurred in a period of roughly 65 years. In a similar fashion, the initial stages of strengthening of the palatal fricative in Córdoba were reported in the early 1960s and has since sustained constant progress forward finally beginning to include early signs of devoicing some 55 years later. Future research efforts will shed light on whether Córdoba is in fact on the same path that led Buenos Aires to full devoicing.

*Affrication in relation to devoicing.* In agreement with Rohena-Madrado' (2015) results in Buenos Aires, the affricate was identified in phrase initial position. However, affrication patterns in Buenos Aires were detected almost exclusively among voicers articulating /j/ as [ʒ]. Of the total 1,139 /ʒ/ tokens in Rohena-Madrado (2015), 79 were articulated as affricates, with only one of those instances produced by a devoicer who articulated /j/ as [ʃ]. The top four female participants who devoiced in

the present study in tasks similar to Rohena-Madrado (2015) displayed more, although still few, cases of the affricate as seen in Table 6.4 below. The slight presence of this variant in these devoicers could be explained taking into consideration that, whereas the participants in Rohena-Madrado were full devoicers, none of the participants in Córdoba shows full devoicing patterns yet but rather alternate between voiced and devoiced variants, as seen in the partial devoicers in decreasing order based on tasks B and C (Table 19). These tasks were comparable to Rohena-Madrado's (2015) tasks of sentence reading and word list reading.

**Table 19**

*Number of Tokens of [dʒ] Produced by the Top Four Partial Devoicers in Tasks B and C Comparable to Tasks in Rohena-Madrado (2015)*

Participant	Number of tokens		
	Style B & C	[j]	[dʒ]
045_JC	94	90	4
007_CC	68	62	6
009_FP	60	55	5
066_LS	56	51	5

### 6.1.2.2 [j] versus [ʒ]

The hypothesis that [ʒ] would have gained significant ground over [j] when compared to results of previous studies has been confirmed by the frequency percentages showing a striking difference between the two variants: 61.58% for [ʒ] versus 4.67% for [j]. The most reliable acoustic measure to distinguish one variant from the other was intensity, with more approximant-like articulations [j] displaying

higher intensity means (dB) than more fricative-like [ʒ] realizations. Based on the segmental and acoustic analyses, the following social and linguistic factors yielded as significant predictors for the palatal fricative [j],

*Style.* In agreement with Labov's (1972) theory related to attention paid to speech, individuals in this study modified their speech based on the formality level of their linguistic output, moving closer to the prestigious forms as their level of attention increased. As anticipated, because increased levels of constriction of /j/ represent forms associated with prestige in Argentina, the more voiced variant was favored in higher percentages during the spontaneous conversation in style A (10.7%) where the least amount of attention was paid to speech, decreasing as the level of attention to speech increased: style D (5.64%), style B (3.14%), and finally style C (3.05%). The acoustic analysis confirms this pattern with higher levels of mean intensity (dB) in the spontaneous speech than in the other three styles. In support of these results of the segmental analysis, significant differences in mean intensity were identified in the same order as that found in the segmental analysis, that is, between style A and styles D, B, and C respectively, while differences between the most attention-oriented styles (C and B) showed no significant difference between them.

*Education.* Individuals with the lowest education level favored [j] more than those with longer exposure to prestige forms through completion of formal education. Acoustic analysis disclosed a significant difference in mean intensity between participants in the lowest and highest ends of the education spectrum. Those with lower levels of education showed higher means of intensity associated with a more approximant-like articulation than those with completed university level education.

*Gender and salary.* The acoustic analysis yielded significant results in mean intensity when gender was combined with salary in a mixed-effects linear regression. While no significant differences were found among women of different salaries, among the men those in the lower salary range produced variants with higher intensity rates, that is, more approximant-like, than men with higher and medium salaries, although the difference between high and low salaries was not significant. Across genders, no differences were found between men and women of high and medium salary ranges, while among men and women with low salaries, men favored the approximant-like variant significantly more than women. This difference in the behavior of the two sexes can be interpreted under the light of the disadvantaged social position of women, who, finding themselves in positions of less economic power, resort to relying on the symbolic capital of language in an effort to balance their social status (Labov, 2001). In addition, as women increasingly abandon their traditional role as homemakers and seek opportunities for self-fulfillment through professional employment outside the home, they become upwardly mobile individuals who “adjust the frequency of certain variables in order to sound more like the class they are joining and less like the one they are leaving” (Chambers, 2003, p. 62). Working-class men with lower salaries, on the other hand, show the predictable behavior when faced with female-dominated changes, opting to follow in the opposite direction by giving covert prestige to linguistic features typical of the lower paid working-class (Trudgill, 1972).

This pattern involving both style and social factors indicates that [j], once the prestige variant, appears to have evolved into a stigmatized social marker resembling

features of a stereotype, as it exists at the awareness level of the community and at times it is overtly discussed (Tagliamonte, 2012, p. 30).

*Syllabic stress, pause, position in word.* Segmental and acoustic analyses yielded results supporting previous findings that have shown evidence of the effect of the linguistic environment of tokens. Segments in atonic syllables, in continuous speech, or in word medial position favor more approximant-like realizations [j] with higher intensity means than more fricative-like articulations [ʒ] with lower intensity means.

*Orthography.* Results of the acoustic analysis showed that tokens orthographically spelled with <y> were produced with more intensity, thus with a more approximant-like articulation [j], than those spelled with <ll>, possibly reminiscent of the previously existing phonemic distinction /ʎ/-/j/ and the association between orthographic <y> and [j] articulation.

### **6.1.2.3 [ʒ] versus [j]**

The hypothesis that instances of a devoiced variant [j̥] would emerge in the speech community of Córdoba has been confirmed as well. Results of the segmental analysis are supported by results of the acoustic analysis, the latter showing duration (ms) as the most adequate measure to distinguish between these two variants.

*Gender.* Women were found to favor [j] significantly more (29.2%) than men (3.8%). As the original scope of this work did not intentionally consider the possibility of significant frequencies of [j̥], no Praat script including the measure of voicing was used, rather voicing was measured through the visual inspection of the spectrogram in

the segmental analysis designed for this particular study. The acoustic analysis comparing these two variants showed that duration was a significant factor differentiating them. In support of the results of the segmental analysis, women showed longer duration rates than men, with longer duration indicating more voiceless-like articulation [ʃ], and shorter duration more voiced-like ones [ʒ].

Although it is too early to ascertain, the progression of the voiceless variant could be considered a change from above (Labov, 1994), that is, a change not originating within the linguistic system of the community of Córdoba itself but in the national capital and spreading to other regions. When such a change occurs in a community, its members are normally aware of the fact that the new variant is an innovation that does not align with the local norm. Labov's Principle 3 of linguistic change states that in changes from above, women will favor incoming innovative forms even if they are not overtly prescribed. Such trend in women has been labeled as the "gender paradox", in which women show both conservative and innovative behaviors that "reflect women's superior sensitivity to the social evaluation of language" (Labov, 2001, p. 291).

*Neighborhood.* Upper and upper-middle class individuals favor [ʃ] more (25.3%) than those from middle class (13.3%) and lower-class (11.4%) neighborhoods. The acoustic analysis supports this trend, showing that participants who reside in upper-level neighborhoods produced more voiceless-like variants with longer duration (ms) than those in middle- and lower-class neighborhoods. In contrast, Rohena Madrazo's (2015) study found that older upper-class and middle-class speakers in Buenos Aires still produce the voiced variant, although with different

voicing rates, while the completion of the devoicing process is found among younger middle-class speakers. This finding is indicative of a change from below that originated below the level of awareness of the community in the lower-middle classes and is spreading among social hierarchies from there. In Córdoba, on the other hand, devoicing represents an overtly recognized variant that originated outside of the local community and is being adopted by the upper classes in conformity with the prestige capital norm, as is characteristic of changes from above. Córdoba residents who enjoy stable and affluent financial conditions are those who take advantage of access to better educational opportunities and possibilities of travel for leisure or for work, therefore being exposed to contact with external influences such as patterns in the capital that automatically carry an appraisal of prestige. Dialect contact through the exposure of media sources such as television has been found to exert an impact on linguistic patterns of a community as well (Stuart-Smith et al., 2013). This result suggests a change from above characterized by the introduction of new forms from other speech communities through the dominant social class that views those innovations as prestigious (Labov, 1994). As devoicing is in its beginning stages, it shows irregular patterns that have not yet dominated the vernacular speech at any social level, but rather appears more evident as the formality of the linguistic context increases.

*Gender by neighborhood interaction.* Overall, women favor the devoiced variant more than men, as confirmed by the longer duration in the acoustic analysis as well as frequency in the segmental analysis. As was hypothesized, the interaction between gender and social class (determined by neighborhood of residence here, one

indicator of social class) yielded significant results. Women from upper class neighborhoods produced significantly more [ʃ] than women from middle- and lower-class ones. However, no significant difference was found between women from middle class and lower-class neighborhoods, who devoiced in similar proportions. No significant differences were found among the scant percentage of male devoicers based on neighborhood. Men appear to be lagging behind women in this process, as expected in situations of change in progress. Among upper class neighborhoods, women produced more [ʃ] than men, while among lower class neighborhoods there was no difference between men and women, supporting the conclusion that devoicing is still in its initial stages of a change in progress and has not yet reached the vernacular speech of the population as a whole, especially the middle and lower classes (Labov, 1994).

*Style.* Acoustic results show a significant difference in duration among styles, with style A showing the smaller mean of duration, that is, more voiced-like [ʒ], followed by styles B, D, and C respectively. The segmental analysis yielded results showing that the devoiced variant was more frequent in style D, followed by styles C, A, B, with no significant differences between A and B. This pattern shows that, although devoicing appears sporadically in the spontaneous speech of Cordoba locals, it is largely limited to contexts where a higher level of attention is involved, and thus more constricted variants associated with prestige are normally produced.

*Position in word.* Word internal position favored [ʃ] more (19.1%) than word initial position (16.0%). Although an unexpected result, if we combine this pattern with that of the affricate [dʒ], it appears that the latter seems to be favored in word

initial position more than the voiceless [ʃ], possibly indicating that Córdoba may currently be situated in a similar stage toward devoicing found in Buenos Aires prior to the completion of the process (Rohena-Madrazo, 2015). Acoustic analysis confirmed this trend, with more devoiced-like tokens showing longer duration means in word medial position and voiced-like tokens favoring word initial positions.

*Pause.* Acoustic analysis revealed that tokens after a pause were articulated more voiceless-like with longer duration means, than those in continuous speech, in line with previous studies showing more constricted, devoiced variants in this linguistic context.

*Orthography.* The acoustic analysis yielded results showing that orthographic <ll> had longer duration tokens favoring the devoiced variant more than <y> tokens.

The previous results reveal that the phenomenon of devoicing, reported to not be present in this speech community in previous studies, may have begun its initial stages in Córdoba as a change in progress from above representing 13.44% of the total number of tokens predominantly among women and specifically women of upper and mid-upper neighborhoods. This finding further supports those of earlier studies reporting the advancement of assibilation and devoicing in regions other than the capital (Lang-Rigal, 2014; Colantoni, 2001, 2006b) As postulated in the hypotheses, because devoicing is an ongoing but early change from above, age is not yet yielding significant results neither as an individual predictor for [ʃ] nor in interaction with other factors.

#### 6.1.2.4 [ʒ] versus /ʎ/

*Style.* Instances of [ʎ] occurred only as part of careful speech (readings and picture-naming task), with participants exercising hyperarticulation of these segments. The very nature of Part C implied the highest level of attention to speech with a predisposition to pronounce words in what was perceived to be the proper way. This was true especially when participants were faced with minimal pairs in which the only difference between the words was their orthography: <ll> or <y>, such as in *malla* ‘swimsuit’ versus *Maya* ‘Mayan.’ In a good number of cases, participants would at first articulate some of the words spelled with <ll> as [ʒ], pause, apologize, and restart the reading of the pair marking the distinction between <y> as [ʒ] and <ll> as [ʎ]. This pattern also occurred frequently with words that were not part of minimal pairs, such as in *lámpara – cuchillo* ‘lamp - knife.’ It needs to be noted here that [ʎ] was identified in style C followed by style D (picture-naming task), which corresponds to the style with less attention to speech than style B (reading of a passage). This result may be due to a priming effect on participants, as it was performed after having engaged in the reading of a word list, in which orthography may have stimulated their awareness of the /j/-/ʎ/ distinction.

*Orthography.* During these tasks, participants showed a one-to-one grapheme-to-phoneme correlation in that they articulated words containing the grapheme <ll> almost unanimously favoring the lateral [ʎ] for <ll> in 11.77% of the cases as opposed to .05% for <y>, reflecting the historical peninsular distinction of the two phonemes and the prescriptive norm that had until recently been taught in schools and applied to both oral and written expressions.

*Age.* The tendency to articulate <ll> as [ʎ] was the strongest in the group of the oldest age group (9.17%), followed by the adults (5.91%) and the young (4.34%). The decreasing frequency of use associated with age may be representative of a change in progress due to modifications in the education system. Seniors and adults were exposed to an education that emphasized a prescriptive awareness of the proper articulation of <ll> as a lateral [ʎ], reminiscent of past peninsular distinction patterns still considered prestigious in the present for representing what is considered “correct Spanish.” More recent pedagogical trends and reforms in the education system place less emphasis, or none at all, on correcting the oral speech of children by emphasizing the historical distinction that has traditionally permeated the language classrooms of the older generations. In the recent past, while the teaching of the distinction in written orthography remains intact, there has been a greater consideration of regional differences in oral speech accompanied by the practice to allow children to embrace their regional linguistic identity by articulating according to their place of origin. This latest development is in sharp contrast with the education received by the older individuals in the groups labeled *adult* and *older adults* in the present study. Further research with participants in younger age groups complemented with reliable and up to date information on current pedagogical practices could shed light on whether this represents a change in progress that could eventually lead to the complete disappearance of this distinction even in formal contexts among the younger generations.

## 6.2 Sociophonetic implications

*Social aspect.* This study has provided evidence supporting previous findings that socially conditioned variation exists in languages at every level of their manifestations, the phonetic level being the one that has attracted the most robust attention (Hay & Drager, 2007). Córdoba is no exception, as the variation found in the present work confirms the city's loyalty to maintaining its identity distinct from that of Buenos Aires by resisting changes in its vernacular, one of its strongest markers of local identity. It would be expected that given Córdoba's regular contact with Buenos Aires, both in person through a constant influx of tourists and business professionals, through personal family relations, and through the media (television, radio, entertainment, social media), this dialect contact would have impacted the speech of *cordobeses* at a much more rapid rate than it can actually be reported by this and other previous research (Colantoni, 2001, 2006b; Lang-Rigal, 2015b). Additionally, changes in the educational system in the last 30 years have de-emphasized oral differentiation between orthographic <l> and <y>, causing the younger generations to lose the distinction in their speech even in contexts of high attention to speech, while still respecting the written spelling.

At present, the city displays striking variation across speakers and contexts, and appears to have reached a stable state for [ʒ] across ages and social hierarchies with a strengthened affricate [dʒ] as the preferred alternative to [ʒ]. Additionally, some instances of the devoiced variant [ʃ] were identified; a voiced variant [j] that, based on social factors that favor it, it appears to be a stigmatized variant, and a residual lateral [ʎ] which appears to be the result of prescriptive academic instruction favoring the old

distinction in contexts where orthography and formality of speech play a role. Social patterns indicate that we may be in the presence of a change in progress that originated in another community (change from above) in its early stages of [ʒ] to [ʃ] with women showing higher rates of devoicing than men, accentuated by the fact that it is women from upper class neighborhoods who show this trend. It remains to be seen if men will eventually gain ground in this devoicing trend. Until further research is conducted in the future with today's younger generations, it cannot be safely concluded whether this variation will remain marginally as an inevitable, but controlled, concession by the upper classes to conform to external prestige forms to which they have the means to be exposed, or if it represents a change that will lead to the same result it did in Buenos Aires.

While there exists an element of stigma in the most voiced articulation of the palatal, that is [j], at the same time this variant corresponds to one of the features of *cordobés* Spanish that identifies members of this speech community and is overtly referred to by locals in general as *cordobés básico* 'basic cordobés' with a certain degree of pride in spite of its status as a stigmatized stereotype. Conversely, the devoiced variant is oftentimes associated with individuals described as *chetos*, a term that carries a connotation of resentment toward the social superiority associated to those who seek to distance themselves from lower class circles by adopting linguistic markers of a community with higher prestige. In 3<sup>rd</sup> wave studies of variation and change this label is referred to as *persona* (Eckert, 2011; Podesva, 2007), or *enregistered voices* (Agha, 2003, 2005) where style shifting is considered to index more than a static social status but rather, "different ways of being" within a

community (Eckert, 2011, p. 456). In summary, social findings in the present work present remarkable synchronic variation including both stable variation and potential changes in progress. There is stable variation with [j], a dominant norm [ʒ] in complementary distribution with [dʒ], a possible change in progress with the devoiced variant [ʃ] having gained some ground, and another possible change in progress indicating further merger of /j/-/ʎ/ with only the older speakers favoring the distinction in formal speech styles.

*Phonetic aspect.* To capitalize on the new directions that Laboratory Phonology has opened in the field of linguistics, it is necessary to consider not only the social forces that trigger linguistic variation and change, but also the phonetic conditions that operate at the cognitive and psychological levels. The results of this thesis would indicate that in the case of multiple variants, a replicable process using visual phonetic cues allows one to better understand the of variation than an acoustic analysis.

Latest frameworks of linguistic theory explore variation and change taking into consideration that language use plays an active role in how sound systems develop and evolve affecting the mental representations and oftentimes the phonetic nature of words (Bybee, 2002; Pierrehumbert, 2001, 2002). It has been observed that sound change affects high-frequency words earlier and more significantly than it does words not used as frequently. The high frequency rates of monosyllables such as *yo* and *ya* in this study merits further analysis in the future taking into consideration Exemplar

Theory (Pierrehumbert, 2002) and usage-based models (Bybee, 2002)<sup>8</sup> to explore sound change in relation to the emergent nature of language given by the cognitive ability to store and remember phonetic detail (Pierrehumbert, 2002). As has been suggested by Ohala (1989), sound change cannot happen unless variation has previously occurred. Such variation may or may not lead to a change in the phonological inventory of a language. However, if it does, whether it be new allophones or new phonemes, it becomes necessary to resort to linguistic theory to explain the mechanisms involved in variation and change in each particular case (Colantoni, 2006a). As has been suggested by Rohena-Madrado (2015, p. 313), it is possible that in the next two generations, the overall fricative inventory of Buenos Aires Spanish could very well be /f, s, ʃ, x/. If a similar change in the linguistic inventory of *cordobés* Spanish were to occur in the future favoring the affricate [dʒ] over the voiceless [tʃ], for example, studies such as that of Colantoni (2001, 2006a) exploring linguistic mechanisms that govern palatal variation in Argentina would provide a more comprehensive panoramic view of the processes involved in such variation and the paths followed as a result.

### **6.3 Contributions to the field**

The tendency to focus on speech patterns of capital cities is justified by their cosmopolitan features that allow researchers to identify multiple patterns. In regions as extensive as Argentina, an in order to paint a more accurate and complete picture of a

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<sup>8</sup> Exemplar Theory is intimately related to usage-based approaches to linguistics. It proposes that fine linguistic detail is stored and continuously built in the human mind as it receives the stimuli through usage, posing that such linguistic representations are dynamically emergent and continually updated. Frequency of use becomes the “shaping force” behind this process (Abramowicz, 2007).

linguistic phenomenon, it becomes necessary to explore speech in areas with more limited exposure to influences that impact the capital, or areas that experience a different set of influences altogether.

The present work has provided a replicable technique to continue to explore the characteristics of Argentine palatal fricatives in regions that may differ from the traditionally prestigious speech patterns of the capital, thus contributing to connect links in the chain of sound evolution and change. The segmental analysis used in this study proved fruitful and reliable in analyzing variants in a voicing continuum with differences among them that may not be easily captured solely through an acoustic analysis suitable to differentiate variants categorically, such as is the case in Buenos Aires with voiced versus voiceless variants.

The segmental technique consisted of the visual inspection in Praat of the waveform and spectrogram of the tokens collected outside of the capital and has provided a synchronic panoramic perspective of change in the evolution of *yeísmo* in Argentina. In the same manner, this technique can be a valuable resource for research exploring not only *yeísmo* variants with these characteristics in other regions of the Spanish speaking world, but also be used to explore other multiple phonetic variants with similar characteristics in Spanish and in other languages.

In addition, the present work responds to the call to concentrate sociophonetic research efforts on phonetic variation of consonants, an area that has been relegated to second place in favor of research on vocalic variation (Thomas, 2002).

#### **6.4 Pedagogical implications**

This type of valuable information tends to fall in the gap that traditionally exists between the world of research and the world of pedagogical practices of language teaching. This gap has been recognized but little has been done to narrow it. The richness of information gained by sociolinguistic research is a rarely untapped resource by teacher training programs, which would do well to incorporate studies of this nature in their design showing the wide range of linguistic variation present in Spanish speaking regions of the world.

In the particular case of this and similar studies showing variation in Spanish, special emphasis should be placed on raising an awareness and appreciation of such varieties while minimizing the perpetuation of ideologies such as *acceptable/correct/pure/standard* Spanish that permeates today's Spanish classrooms in the United States. As a general rule, Introduction to Hispanic Linguistics textbooks, and Phonetics textbooks often make reference to "Argentine Spanish" focusing on Buenos Aires or *porteño* Spanish, thus painting an inaccurate picture of the variation that exists in extensive territories such as Argentina. The results of the present work and others should be used in classrooms showing that the reality is significantly more complex in Argentina, where the norm of its capital does not necessarily reflect the norm of other regions of the interior. Learners of Spanish will then be better prepared to embrace differences and adjust accordingly to regional dialectal manifestations as valid and acceptable, both locally and abroad. Recent efforts such as that of Elola and Prada (2020) exploring the impact of pedagogical practices to "enhance students' critical awareness toward the [social and cultural] value of [local minority languages]

and the communities that use them” (p. 223) make great contributions toward closing the chasm.

## **6.5 Limitations and future directions**

The results of this work have to be considered in light of some limitations. While the number of tokens produced by participants provided sufficient data for statistical power, the challenge involved making decisions regarding the social categories under which each participant would be placed. As Ash (2013) indicates, social class represents a difficult task because of the abundance of factors that can come into play to define a hierarchical order in a given community, greatly varying from one community to the next. Furthermore, certain members in a community may be difficult to place because of the possibility to be allocated in more than one social category depending on which demographic characteristic the researcher decides to focus. Future research conducted within the first wave of studies of sociolinguistic variation and change should invest a significant amount of time and effort researching the community to be studied both from without, by taking advantage of data in sociological research of the community, and from within, by acquiring as much insider’s insight as possible, to ensure that participants are as accurately as possible representing the pre-established social categories considered as independent variables. In communities as extensive and complex as the city of Córdoba, studies under the second and third wave of sociolinguistic variation and change show much promise. The challenge of delimiting social hierarchies and the limitations that it poses could be addressed by conducting future research within these frameworks by zooming in into

local social dynamics more closely. Exploring these preliminary results of variation and possible change in progress in Córdoba within the second wave, for example, would allocate a greater degree of agency on the participants who are seen as taking an active role in making linguistic choices based on the density and complexity of local social networks with which they normally associate (Eckert, 2000). Social categories related to association with a desired identity emerge from the data. This approach bridges the gap between broad macrosociological categories and local social categories characteristic of a specific speech community, and would in part alleviate the challenge of having to decide beforehand social hierarchies in communities where multiple factors may contribute and often overlap to make the task difficult. Under the light of the third wave of studies of variation and change, no static macro or micro local categories are pre-established, but rather individual style variation is explored to describe variation and change in a community as participants continually style-shift in order to indicate individual and social stances and identities.

Future research should consider the inclusion of younger generations represented by adolescents to factor in the impact of age on a possible change in progress, as has been documented in previous studies. A larger number of participants of both sexes of the oldest generation should be considered in future research to balance the sample population more evenly.

The present study also posed the challenge of difficult accessibility to low-income neighborhoods where members of the community with low educational levels concentrate. This was reflected in the imbalanced number of participants within that category. Accessibility to these areas of the city requires the availability of resources

to provide safe access to those areas of the city that the researcher did not have at her disposal, other than resorting to the friend-of-a-friend technique known as the snowball sampling technique (Milroy & Gordon, 2008). Future research will do well to consider alternative ways of gaining access to participants in areas of a community that represent accessibility challenges by employing methods such as delegating the task to trained interviewers or making arrangements to bring these participants to a safer and more neutral environment where to conduct the interviews. In future efforts, researchers should begin the recruiting task well in advance of the interviewing process to ensure that unexpected negative responses and cancellations do not affect the composition of the sample population in an overly negative manner.

The finding that the strengthened affricate variant [dʒ] in Córdoba can also be associated with certain social factors merits attention. Will the affricate palatal, which in most studies has been found to be essentially governed by linguistic factors, become the strengthened variant of choice to mark local identity, in place of the voiceless variant characteristic of Buenos Aires? If this were the case, studies designed under laboratory phonology frameworks would shed light on possible allophonic changes that might lead to a modification in the phonological inventory of *cordobés* Spanish, as has been suggested that may be the case with Buenos Aires Spanish (Rohena-Madrado, 2015).

An area of research that had been neglected but is currently making great strides in studies of variation and change is that of the role of social perception as a complement to the information gained with the analysis of production (Chappell, 2019; Moya & García Wiedemann, 1995; Regan, 2019; Regan, forthcoming; Thomas,

2002; Watson & Clark, 2013). Previous research has found that listeners exercise social judgment based on the linguistic features that speakers favor (Barnes, 2019; Davidson, 2019; García, 2019; Mazzaro & González de Anda, 2019). For example, during the spontaneous part of the interview, when participants were asked to describe what they thought were the main features of *cordobés* Spanish, the pronunciation of /j/ as [j] was referred to as *cordobés básico* ‘basic cordobés,’ by all participants, a local expression that denotes a social appraisal of stigma toward this articulation. Incorporating a section of social perception will add valuable information to complement the results of the analyses of production of the participants and offer a more comprehensive picture of the state of yeísmo in Córdoba from the perspective of insiders. Previous studies have explored the role of perception in identifying speakers’ socioeconomic level and ethnicity (Harms, 1961, 1963; Purnell et al., 1999; Ryan, 1979), as well as how gender stereotypes can have an impact on the perception of another’s speech (Mack, 2010a, 2010b; Strand, 1999). Given that the bulk of sociolinguistic research on perception has been conducted with varieties of English (Barnes, 2015), future studies exploring Spanish variation and change including a perception portion, such as Lang-Rigal (2014, 2015a) and Lenardón (2017) on the perception of the *cordobés* intonation, will further contribute to providing a more complete view of how, or if, appraisal of linguistic choices in different varieties of Spanish vary per social factors of both speakers and listeners.

## 6.6 Concluding remarks

This study is at the forefront of studies focusing exclusively on the current state of *yeísmo* in the city of Córdoba. To my knowledge, research efforts undertaking a similar task in Córdoba within a sociophonetic framework are lacking. Thus, this work opens the door for further efforts to explore the ongoing diverse paths of a linguistic phenomenon that began six centuries ago and continues to evolve taking different socially and linguistically motivated regional manifestations. As exposed in the review of previous studies in Chapter 2, the social appraisal of the different manifestations of *yeísmo* vary greatly by region. Those variants that enjoy a status of prestige in one community may correspond to socially stigmatized variants in another, and such appraisal can also shift with time, as has been reported in previous studies such as that of Labov (1994) exploring the articulation of short *a* in Philadelphia. In Quito, Ecuador, the variants [ɟ] and [j] are associated with social stigma (Gomez, 2013), as is the variant [dʒ] characteristic of the Amazonian region of Perú (Caravedo, 2013). These two recent scenarios stand as a sharp contrast of what occurs in Argentina, where these variants are associated with prestige. Furthermore, as linguistic changes take place, a shift in social appraisal happens alongside with the change, as has been the case in each stage of evolution of *yeísmo* in Argentina. Not only does the social appraisal vary among Spanish speaking countries but also among regions of the same nation. The process of devoicing [ɟ]>[j] in Buenos Aires was encountered by negative social judgment in its early stages as a change from below (Honsa, 1965; Zamora Vicente, 1949). Patterns in Córdoba uncovered in the present work suggest

that, as a change from above, [j] enjoys a status of prestige in its early stages as it is being used mostly by women in upper-level neighborhoods

While manifestations of *yeísmo* appear to remain in a state of stability in certain Spanish-speaking regions for the most part, or at least not show a wide a range of variation even when change has occurred, this has not been the case of *yeísmo* in Argentina. This work has shown that *yeísmo* in Córdoba is at a crossroads. It differs sharply from patterns observed in other Spanish speaking regions, and possibilities of shifting toward those patterns are meager. It also shows a wider range of variation compared to the current state on *yeísmo* in Buenos Aires, in a continuum of variants ranging from the most voiced to the voiceless, and all variants in between, with both socially and linguistically conditioned differences. While there are similarities in the path that conducted to the current palatal standard in Buenos Aires (Chang, 2008; Fontanella de Weinberg, 1992), the low frequency of the devoiced variant places this process in its early stages, and its propagation is slower than has been registered in other provinces. A third alternative ([dʒ]) stands as a possibility in the form of a slower, possibly distinctive path that will contribute to maintain Córdoba's strong sense of identity intact through its vernacular. Some early researchers exploring the innovative process of devicing in Buenos Aires in its early stages concluded that this new variant was only a rare and occasional divergence from the norm (Alonso, 1951), and questioned other researchers' predictions that this process would reach completion in the future (Zamora Vicente, 1949). It is hoped that this work will inspire the continuation of sociolinguistic research in Córdoba to continue unveiling the path of *yeísmo* in this metropolitan city, whether it will reflect that of Buenos Aires or follow

a unique direction. Furthermore, this work seeks to inspire research of *yeísmo* not only in understudied regions of Argentina, but also in overlooked areas in the rest of the Spanish-speaking world.

I have provided further evidence that linguistic processes are far from homogeneous but rather show manifestations related to the social characteristics of different speech communities. In light of the recent interest in conducting sociolinguistic research using laboratory phonology methodologies, it is also hoped that more studies on *yeísmo* will make significant contributions to linguistic theory as they explore the internal mechanisms involved in language variation and change.

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## APPENDICES

### APPENDIX A

#### PARTICIPANT CONSENT FORM – INTERVIEW

- *What is this project studying?* This study focuses on language patterns in the speech community of Córdoba. What we learn will help describe patterns in the way native residents of Córdoba speak, compare them with past patterns, and make predictions regarding the direction they seem to be following in the future. I hope to publish this study widely to make this information as beneficial and useful as possible to future sociolinguistic research efforts in different speech communities.
- *What would I do if I participate?* In this study, you will be asked to participate in an oral interview with the researcher and answer some questions about yourself, your community, and other very familiar topics to you about which you are comfortable speaking. The interviews will be audio recorded in order for me to obtain accurate information.
- *Can I quit if I become uncomfortable?* Yes, absolutely. Your participation is completely voluntary. You may skip any question you do not feel comfortable answering. You can also stop answering questions at any time. You are free to leave any time you wish. Participating is your choice. However, I do appreciate any help you are able to provide.
- *How long will participation take?* We are asking for 30-45 minutes of your time to devote to the interview in person, either at your home or another appointed place.
- *How are you protecting privacy?* Your name will not be linked to any documentation and any use of this material in reports, publications or presentations will never be associated with participants in this study. No one other than the researchers associated with this project will have access to the raw data. All related documentation will be stored either in a locked file cabinet in the researcher's office or on a password protected computer.
- *I have some questions about this study. Who can I ask?* • The study is being run by Carolina Archer, graduate student at Texas Tech University in Lubbock, Texas, USA, under the supervision of Dr. Brendan Regan from the Department of Classic and Modern Languages and Literature at Texas Tech University. If you have questions, you can call him at XXX-XXX-XXXX. TTU also has a Board that protects the rights of people who participate in research. You can ask them questions at XXX-XXX-XXXX. You can also mail your questions to \_\_\_\_\_

Signature: \_\_\_\_\_

Signature Date \_\_\_\_\_

Printed Name \_\_\_\_\_

This consent form is not valid after May 31, 2021.

### Consentimiento del participante – Entrevista

- *¿Qué estudia este proyecto de investigación?* Este estudio se enfoca en patrones de habla característicos de la comunidad de habla en la ciudad de Córdoba. Lo que encontremos puede ayudar a describir patrones actuales en la manera de hablar de residentes nativos de Córdoba, asociarlos con significados sociales, compararlos con patrones pasados, y hacer predicciones en cuanto a la dirección que parecen estar tomando en el futuro. Espero poder publicar este estudio para que esta información sea de beneficio y utilidad para futuros estudios sociolingüísticos en diferentes comunidades de habla.
- *¿Qué debo hacer si decido participar?* Se te va a pedir que participes en una entrevista oral con la investigadora y responder a algunas preguntas sobre vos mismo(a), tu comunidad, y otros temas familiares y de los que te sientas cómodo(a) hablando. La entrevista va a ser grabada para más tarde tener acceso a la información exacta tal como fue expresada. Parte de la entrevista incluirá grabarte mientras lees un párrafo muy breve de sólo 3 líneas, y un conjunto de palabras. Por último, se te pedirá que escuches una grabación y comentes sobre las características de la persona a quien has escuchado.
- *¿Puedo abandonar el estudio si me siento incómodo(a)?* Por supuesto, tu participación es completamente voluntaria. Podés pasar por alto cualquier tema o pregunta que no desees responder. También podés dejar de responder cuando lo desees. Participar es tu elección. Sin embargo, te agradeceré mucho si accedes ayudar participando.
- *¿Cuánto tiempo durará mi participación?* La entrevista descrita más arriba durará aproximadamente entre 30-45 minutos. Esta entrevista se llevará a cabo en tu casa, o en otro lugar previamente acordado entre vos y la investigadora, el día y a la hora de mayor conveniencia para vos.
- *¿Cómo se va a proteger mi privacidad?* En ningún momento tu nombre va a ser usado ni relacionado con ningún dato que se use en el informe del material recogido, en publicaciones, o en presentaciones. Nadie más que la investigadora y su supervisor tendrá acceso a los datos recogidos. Toda la documentación recogida será almacenada en una computadora protegida por contraseñas y en una cabina de archivos con llave en la oficina privada de la investigadora.
- *Tengo más preguntas sobre este estudio. ¿A quién puedo acudir?* Este estudio está siendo conducido por Carolina Archer, estudiante post grado de la universidad Texas Tech en Lubbock, Texas, USA; bajo la supervisión del Dr. Brendan Regan, de la Facultad de Lenguas y Literatura Clásicas. Si tenés preguntas, puedes contactarte con él al XXX-XXX-XXXX, o por correo electrónico: \_\_\_\_\_. TTU también cuenta con un Comité que protege los derechos de las personas que participan en estudios de investigación. Podés hacerles preguntas llamando al XX-XXX-XXXX. También podés enviar tus preguntas a: \_\_\_\_\_

Firma: \_\_\_\_\_

Fecha de firma: \_\_\_\_\_

Nombre en imprenta: \_\_\_\_\_

Este formulario de consentimiento no es válido después del 31 de mayo de 2021.

## APPENDIX B

### INTERVIEW PART A, SUPPORTING QUESTIONS

#### Life in Córdoba

- ¿Siempre has vivido en esta casa (y en este barrio)? *Have you always lived in this house / neighborhood?*
- Contame un poco cómo es el barrio, cómo es la vida aquí, qué te gusta y qué no te gusta de él. ¿Qué tal los vecinos? *Tell me some about what this neighborhood is like, what is life like around here, what do you like and don't like about this area of town. What are the neighbors like?*
- ¿Cómo es un día típico para vos? O sea, contame qué haces en un día típico desde que te levantás hasta que te acostás. *What does your typical day look like? What do you do on a typical day when you get up until you go to bed at night.*
- ¿En qué barrio naciste? ¿Qué cosas te gustan de la ciudad de Córdoba, y qué cosas cambiarías o mejorarías? *What neighborhood were you born in? What do you like about the city of Córdoba? What would you change or improve?*
- ¿Qué consejo le darías a un turista que viene a visitar Córdoba por primera vez? ¿Qué lugares le dirías que tiene que conocer y por qué? *What advice would you give someone who visits Córdoba for the first time? What places would you say he needs to visit? Why?*
- Contame un poco cómo es el clima aquí en la primavera y el verano. *Tell me some about the weather patterns in the city in the spring and summer.*
- ¿Cuál dirías que es una comida típica en Nochebuena y Año Nuevo en un hogar en Córdoba? (pollo, mayonesa de ave) *What would you say is a typical meal on Christmas Eve and New Year's Eve in a typical home in Córdoba?*
- ¿Qué deporte es el más popular en Córdoba? ¿Cuáles son los equipos más populares? ¿Con cuál te identificás vos? *What is the most popular sport in Córdoba? What are the most popular teams? Which one do you identify yourself with?*

#### The current economic situation of Argentina

- ¿Cómo ves la situación económica en Argentina en este momento? *What is your opinion about the current situation with the economy in Argentina?*
- ¿Qué te parece que debería suceder para que las cosas cambien? *What do you think needs to happen for things to change?*

### Memories from the past

- Pensá en tu niñez, ¿cuál es el recuerdo más lindo que tenés de cuando eras chico(a)? *Think about your childhood. What is the best memory you have from when you were a child?*
- ¿Cómo era un día típico para vos cuando tenías 10 años? *What was a typical day like for you when you were around 10 years old?*
- ¿Cómo ves diferente hoy el estilo de vida de un chico de 10 años comparado con tu estilo de vida cuando eras chico? *How different do you think the lifestyle of a 10 year old is today compared to your lifestyle when you were that age?*
- ¿Quién fue una persona que tuvo mucha influencia en tu vida, y por qué? (Pariente, maestro, etc). *Who was someone in your life who made a strong impact on you? Why?*

### Closing

- Te agradezco mucho tu participación en esta conversación. Ahora te voy a pedir que me leas un párrafo muy corto, luego de eso una lista de palabras, y por último te voy a mostrar unas tarjetas con unos dibujos y vos me tenés que decir qué ves. De esta manera vamos a terminar la grabación. *I deeply appreciate your participation in this conversation. I will now ask you to read a short story for me, followed by a list of words, and then I will show you a set of cards with pictures in them and ask you to tell me what you see. That will end the recording of this interview.*

## APPENDIX C

### INTERVIEW PART B, PARAGRAPH READING

*(Tokens underlined for reader's convenience)*

La leyenda de la yerba mate cuenta cómo Yací, bella diosa de la luna de larga cabellera blanca bajó a mirar la belleza de la tierra. Maravillada por el canto de los grillos y el sonido del arroyo cristalino, yacía sobre la gramilla y no se percató del yaguareté que la vigilaba y seguía de cerca. Al ser acosada por el animal, un anciano guaraní oyó sus gritos y llegó a tiempo para salvarle la vida lanzando una flecha al animal, el cual huyendo, cayó luego tendido al suelo. Cuando ya pasó el peligro, ella, con llanto de emoción y agradecimiento, le regaló al hombre mayor una planta con la propiedad de fomentar paz y hermandad entre los hombres: la yerba mate. Le ayudó a preparar un té llenando con sus hojas secas un zapallito ahuecado, bebiéndolo con una bombilla, y compartiéndolo con sus más allegados. Hoy en día, el mate es la bebida social por excelencia de los argentinos y de la adyacente República del Uruguay, aunque se pueden hallar grandes diferencias entre las yerbas usadas en ambos países, como también su forma de prepararlo. En Uruguay como en Argentina, la gente toma mate en la playa, en las plazas, en casa con amigos y familiares, pero solo los uruguayos andan por las calles portando el termo y el mate. Ellos beben mientras caminan, conducen, andan en bicicleta o en ómnibus, y hasta en motocicleta. Esta práctica para los argentinos conlleva una apreciación social negativa que contribuye a la eterna rivalidad entre los llamados rioplatenses. Sin embargo, en ambos lados del río, se disfruta de la infusión, con yerba con o sin yuyos, y acompañada con facturas, pan, o galletas, en días soleados o de lluvía, pero mayormente en compañía de los más allegados, tal como Yací lo había indicado.

## APPENDIX D

### INTERVIEW PART C, WORD LIST

Word list including minimal pairs, independent words  
with tokens of <ll> and <y> and *distractor pairs*

1.  *piso – cena*
2. **cave – calle**
3. Roxana – Yolanda
4. **haya – halla**
5. enseña – conleva
6. *ola – aro*
7. **maya – malla**
8. responsable - inllevable
9. **avo – hallo**
10. **botella** – entrada
11. lámpara – **cuchillo**
12. *cometa - silencio*
13. carpeta – **belleza**
14. arreglar – **enllantar**
15. **vaya – valla**
16. *cosa – perro*
17. **millas** – papel
18. escuela - **coyote**
19. pescado – **llanura**
20. *música – lámpara*
21. **yerba** - beba
22. **lleno** – vacío
23. **adyacente** – permanente
24. perla - **yunta**
25. *manta – tarro*
26. carne - **llave**
27. **ayuno** - sirena
28. carro – **llaga**
29. *cinco – rosa*
30. **yate** – mate
31. **llueve** – huevo
32. torero - **creyera**
33. rezar – **llorar**
34. *aroma – alfombra*
35. **subyugar** - comenzar
36. **llamada** – persona
37. bueno – **yendo**
38. **camello** - carreta
39. **yacía** - lectura
40. **cónyuge** – pésimo
41. *reloj – señor*
42. **inyección** – corrección
43. **apoyo** – canario
44. **camilla** - pintura
45. luna - **ayer**
46. pintura - **payaso**
47. ratón - **pollo**
48. gato – **cuyo**
49. **ralla - raya**
50. *árbol – cerro*
51. **cavo – callo**
52. **disyuntiva** – iniciativa
53. **misa** - **yoga**

## APPENDIX E

### INTERVIEW PART D, PICTURE NAMING TASK



Images extracted from *LessonPix.com*.

**APPENDIX F**

**DEMOGRAPHIC QUESTIONNAIRE FOR PARTICIPANTS**

Adapted from Regan, (2017)

**Información demográfica del participante**

Fecha de entrevista: \_\_\_\_\_ Lugar: \_\_\_\_\_

Hora: \_\_\_\_\_ Duración: \_\_\_\_\_

**Datos personales:**

Nombre del participante: \_\_\_\_\_ Código de participante: \_\_\_\_\_

Edad: \_\_\_\_\_ Sexo: **F** **M**

Lugar de nacimiento: \_\_\_\_\_

Estudios completados: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Institución: \_\_\_\_\_ Carrera: \_\_\_\_\_

Profesión u ocupación actual: \_\_\_\_\_

Salario promedio actual:	\$0 – \$10.000	\$10.001 – \$30.000
	\$30.001 – \$50.000	\$50.001 - \$70.000
	\$70.001 - \$90.000	\$90.001 - \$100.000+

Barrio de residencia actual: \_\_\_\_\_

Barrio(s) de residencia anterior: \_\_\_\_\_

¿Hablás otro(s) idiomas? **sí no** ¿Cuál(es)?

¿Has vivido en otra(s) provincias? **sí no**  
¿Cuál(es)? \_\_\_\_\_ ¿Por cuánto tiempo? \_\_\_\_\_

¿Has vivido en el extranjero? **sí no**  
¿Dónde? \_\_\_\_\_ ¿Por cuánto tiempo? \_\_\_\_\_

Estado civil: **soltero • relación no oficial • casado • viudo • separado • divorciado**

**Datos familiares**

Cónyuge o pareja:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Padre:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Madre:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Abuelo materno:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Abuela materna:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Abuelo paterno:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

Abuela paterna:

Lugar de nacimiento: \_\_\_\_\_

Estudios: **sin estudios • primario • secundario • terciario • universitario • posgrado**

Profesión u oficio: \_\_\_\_\_

**APPENDIX G****DEMOGRAPHIC CHARACTERISTICS OF PARTICIPANTS**

<b>Code</b>	<b>Sex</b>	<b>Age</b>	<b>Education level completed</b>	<b>Current occupation</b>	<b>Neighborhood of residence</b>	<b>Neighborhood by parcel price 1low; 2middle; 3 high</b>	<b>Salary in AR pesos</b>
001	F	71	Elementary	Retired (commerce)	Alto Alberdi	3	10-30K
002	M	57	High school	Entertainer	Downtown	3	0-10K
003	M	19	High school	Secretarial work	Alto Alberdi	3	0-10K
004	M	57	Elementary	Construction	Alto Alberdi	3	0-10K
005	M	58	University	Architect/Educator	Alto Alberdi	3	30-50K
007	F	51	High school	Administration/commerce	Claros Village	2	30-50K
008	F	50	University	Educator	Jardín	2	30-50K
009	F	60	University	Accountant	Lomas Villa Allende	3	30-50K
010	F	24	High School	Univ. Student	Lomas Villa Allende	3	0-30K
011	F	61	University	Retired (education)	Jardín	2	30-50K
012	F	36	High school	Housemaker	Los Robles	1	0-10K
013	M	39	Terciary	Commerce	Los Robles	1	30-50K
014	F	71	High school	Retired (	Los Naranjos	2	0-10K
015	M	30	High School	Commerce	Alto Alberdi	3	30-5-K
017	F	50	Terciary	Commerce	Villa Mafekin	1	10-30K
018	M	57	University	Medical doctor	Cerro Chico	3	90-100K
019	F	76	Terciary	Retired (Education)	Alto Alberdi	3	10-30K
020	F	37	High School	Cleaning	Parque Los Fresnos	1	0-10K
021	F	26	High School	Univeristy student/educator	San Fernando	2	0-10K
022	F	35	University	Educator	Yapeyú	2	30-50K
033	F	49	Terciary	Homemaker	La Herradura	2	0-10K
024	F	78	Terciary	Retired (education)	Alto Alberdi	3	10-30K
025	F	37	High school	Administration	Los Robles	1	30-50K
026	M	39	High school	Day laborer	Lomas Mendiolaza	1	0-10K
027	M	22	High school	Commerce	Don Bosco	2	30-50K
028	M	52	High school	Commerce	Don Bosco	2	30-50K
029	M	32	High school	Employee	Alto Alberdi	3	10-30K
030	F	27	High school	Cleaning	Villa Mafekin	1	10-30K
031	F	29	High school	Cleaning	Yofre Sur	1	10-30K
032	F	52	University	Medical doctor	Alto Alberdi	3	50-70K
033	F	51	University	Dentist	Cabañas del Pilar	2	30-50K

034	F	48	High school	Commerce	Gral. Bustos	2	0-10K
035	F	51	High School	Administration	Cupani	2	90-100K
036	F	51	University	Architect	Alto Verde	2	10-30K
037	M	51	High school	Electrician	Argüello	2	30-50K
039	F	20	Elementary	Student	Industrial -La Calera	1	0-10K
040	M	23	Elementary	Student	La Campana – La Calera	1	0-10K
041	M	23	Elementary	Construction/student	Dr. Cocca – La Calera	1	0-10K
042	M	24	Elementary	Student	Dr. Cocca – La Calera	1	0-10K
043	F	18	Elementary	Student / hairdresser	EL Chorrito – La Calera	1	0-10K
044	M	51	University	Administration	Fincas del Sur	2	90-100K
045	F	18	High school	University student	Jardines del Jockey	3	0-10K
048	M	53	University	Kinesiologist	Alberdi	3	30-50K
049	F	70	Terciary	Retired (Education)	Alto Alberdi	3	10-30K
050	M	78	High school	Salesman	Alto Alberdi	3	30-50K
051	F	32	High school	Cleaning	Alberdi	3	10-30K
052	M	45	Terciary	Taxi driver	San Martin	2	10-30K
053	M	39	University	Educator / Administrator	Alto Alberdi	3	90-100K
054	M	59	University	Accountant	Jardín Hipódromo	2	30-50K
055	M	26	High school	Industry	General Sabio	1	10-30K
056	M	56	Elementary	Employee	General Mosconi	1	10-30K
057	F	81	Terciary	Retired (Education)	Alto Alberdi	3	10-30K
058	F	68	Terciary	Retired (Education)	Alto Alberdi	3	10-30K
059	M	75	Elementary	Retired (administration)	Jardin	3	10-30K
060	F	74	Elementary	Retired (housemaker)	Jardin	3	0-10K
061	F	20	High school	University student	Almirante Brown	1	0-10K
062	F	18	High school	University student	Ituzaingó	1	0-10K
063	M	20	High school	University student	Ana María Zumarán	2	0-10K
064	M	44	High school	Commerce	Parque Capital	2	30-50K
065	F	20	High school	University student	Alto Alberdi	3	0-10K
066	F	51	University	Psychologist	Downtown	3	30-50K
067	M	65	University	Retired (Education)	La Estanzuela II	2	70-90K
068	F	44	High school	Administration	Jardin	3	30-50K
069	M	52	University	Auctioneer	Alto Alberdi	3	30-50K
070	F	51	University	Lawyer	Alto Alberdi	3	10-30K