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A Perceptual and Experimental Phonetic Approach to Dialect Stereotypes: The *Tonada Cordobesa* of Argentina

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**A Perceptual and Experimental Phonetic Approach to Dialect
Stereotypes: The *Tonada Cordobesa* of Argentina**

by

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Dedication

A los cordobeses.

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A Perceptual and Experimental Phonetic Approach to Dialect Stereotypes: The *Tonada Cordobesa* of Argentina

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This study investigates the perception of vowel lengthening in the *tonada cordobesa*, a feature of the Spanish spoken in Córdoba, Argentina. Unlike other dialects of Argentine Spanish, lengthening occurs in the pre-tonic syllable (Fontanella de Weinberg 1971; Yorio 1973; Lang 2010) and is believed to be accompanied by a pitch peak (Fontanella de Weinberg 1971). The goals of this dissertation are to determine if duration alone (i.e., without intonational changes) is significant in identifying a speaker's Córdoba provenance, and to discover what listener features affect perception. A matched-guise methodology presents speech tokens with natural and manipulated pre-tonic vowel durations to Argentine listeners in a dialect identification task. Results show a main effect of speaker region and token type (natural versus manipulated). Shorter durations made Córdoba speakers difficult to identify, reducing accuracy from 59% for natural tokens to 28% for manipulated tokens with shortened pre-tonic syllables. Buenos Aires speakers received the highest identification accuracy for natural tokens (80%) and Tucumán speakers the lowest (43%). Longer pre-tonic vowel durations are associated with a Córdoba identity, regardless of speaker origin and other linguistic cues. Control tokens produced by speakers from Buenos Aires and Tucumán confirmed this effect: these tokens, when manipulated to have a longer pre-tonic vowel, induced the perception of a

Córdoba identity. Listener experience is also shown to improve accuracy of dialect identification: listeners of more geographically distant provinces, relative to the speaker's province of origin, present significantly reduced identification rates. Acoustical analyses of the Córdoba samples confirm pre-tonic lengthening as well as an early peak rise within the stressed syllable, and valley alignment before the onset of this syllable. Pre-tonic, tonic and post-tonic syllable durations are lengthened, resulting in a segmentally unbalanced intonational phrase for which prominence is disproportionately concentrated in these final segments. The durational, intonational, and rhythmic properties make the Córdoba dialect unique among regional dialects within Argentina and across the Spanish-speaking world. This research contributes experimental evidence for the prosodic features marking this dialect and supports its saliency and social significance within Argentina.

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Chapter 1: Introduction

*Un negro Cordooobe, estaciona la
moto y entra a un cajero automático,
pasa la tarjeta y en la pantalla sale:
“DIGITE LA CLAVE”
El negro dice:
No, io no la dije!!!
En la pantalla sigue la frase:
“DIGITE LA CLAVE”...
y él responde casi llorando:
nooo’ culiau !!! te lo juro que no se la
dije a nadie!*

This joke, sent to me from a friend from Córdoba, gives visual and symbolic representation of the phenomenon examined in this dissertation. In its first line the orthography of <Cordooobe> faithfully reflects a visibly lengthened penultimate syllable of the word *cordobés*. This type of syllable lengthening is observed by linguists and lay people alike as a marker of Córdoba identity. This joke tells us even more about the vernacular language with omission of the syllable final /s/, in both <Cordooobe> *cordobés* and <DIGITE>, functioning as the center of the joke, a pun on the word DIGITE/dijiste “enter the digits”/“you said.” This joke also exemplifies palatalization in <io>, pronounced as [jo], which distinguishes the pronunciation of the *cordobés* (person of Córdoba origin) from that of other Argentines who realize a “sh-like” pronunciation for *yo* [ʒo]. The final token of Córdoba-ness represented in this joke is doubly illustrated in the deletion of intervocalic /d/ in what is probably the most typical swear-word for a *cordobés*, *culiado*. In addition, the use of *negro* to refer to the protagonist of the joke

does not refer to skin color or race, but gives a colloquial denotation for “guy,” simultaneously associating the typical *cordobés* with this style of speech and with an unintelligent, yet passionate reaction to the simple task of using an ATM machine. If such a brief sample of written language can mark so much social information linguistically, imagine what speakers reveal through their speech in interaction. It is from this imagining that this dissertation takes inspiration.

Sociolinguistic research has consistently shown that social meaning is indexed via different linguistic variants (Labov 1963; Levinson 1983; Ochs 1992; Eckert 2000, *inter alia*). Under a speech perception approach, this research has unveiled some realities of how listeners make very specific judgments of a speaker’s personality, intelligence, ethnicity, region, economic status, or sexual orientation based on just a few linguistic cues. Thus, the realization of a phonetic variable is potentially linked to multiple social indices that are revealed as listener percepts, which may come from previous experiences and stereotypes associated with users of a linguistic variant.

The present study examines a particularly salient feature of the Spanish spoken in Córdoba, Argentina, from the point of view of the speakers of this dialect themselves and speakers of other dialects in Argentina, including those of the dominant dialect, Buenos Aires. This study employs speech perception methodology to collect and interpret the unique prosodic features of Córdoba speakers within the perceptual reference of dialect identification. Specifically, this research has two aims: to ascertain whether listeners can identify the Cordoban dialect and to determine what acoustic features are most salient in the recognition of this dialect. With respect to its phonological properties, the Cordoban dialect is typically signaled for its intonation; and yet, to date, the specific intonational

properties remain to be confirmed with precise measurements. Moreover, the perception of this dialect has yet to be studied.

Fittingly, in the joke heading this dissertation, the word ‘cordobés’ exemplifies a pronunciation characteristic of and unique to the speakers from this region, the *cordobeses*. However, this joke tells us more about the *cordobeses* than just their penchant for vowel lengthening. It also tells us about the humorous approach to their own way of speaking and acting. This joke gives the impressionistic observation of which parts of speech make a *cordobés* stand-out, relative to those who do not qualify as a *negro cordobés*, and shows the *cordobés* a view of himself but through an outsider’s lens. This joke, like many others, illustrates the self-perception that is imagined to occur from an external perspective. The representation of the character’s language shows how the person being laughed at (i.e., the *cordobés*) thinks others view him and specifies which features are likely to be judged as differentiating him from the others’ assumed point of view. Discovering this perception of how the *cordobés* and his way of speaking are viewed by the *cordobés* himself and by the *porteño* from Buenos Aires is the aim of this research.

Thus, the objectives of this dissertation, broadly stated, are to gain an understanding of the salient prosodic phenomenon commonly referred to under the popular term *la tonada cordobesa* and the sociolinguistic interpretation of the *tonada* among speakers and non-speakers of this dialect. These goals will be met with production and perception experiments.

1.1 LA TONADA CORDOBESA

While the term *tonada* in Argentina can refer to any accent in general, that of Córdoba may be simply evoked as *la tonada*, the accent, which indicates the degree to

which this variety has become a marker of place and identity in the Spanish of Argentina (Fontanella de Weinberg 1971). Further evidencing how this accent is perceived and described, the *tonada cordobesa* is also denominated the *cantito cordobés*, or “little Cordoban song,” which more specifically references its characteristic feature, the intonation. The preeminent Argentine linguist Fontanella de Weinberg in her 1971 study “*La entonación del español de Córdoba*” affirms that intonation “... *permite distinguir de inmediato a un hablante cordobés de otro nativo de cualquier otra región de la Argentina* or “permits the immediate distinction of a Cordoban speaker from another native of any other region of Argentina,” (my translation), (Fontanella de Weinberg 1971:11). The overarching goal of this dissertation is to question Fontanella de Weinberg’s affirmation by posing the central question: do speakers immediately distinguish a speaker of Córdoba by their intonation?

Before advancing to a detailed linguistic description of the *tonada cordobesa* and the literature review and the experiments that follow, the ensuing discussion in this chapter aims to place the *tonada* within its cultural and historical contexts. The objective is to guide our understanding of this phenomenon from the observations made by linguists, speakers, and listeners familiar with this variety. The following sections trace the linguistic descriptions of the first observations by linguists of the *tonada cordobesa* and the role of this dialect in the history and present day culture of Argentina.

1.1.1 First observations by linguists

The variety of Spanish spoken in Córdoba, Argentina has not escaped popular attention. It has rarely been an object of serious study and remains not well understood. Early linguists pointed out the peculiar rhythm characteristic of this dialect. In his extended work on phonetic aspects of Argentine Spanish, the Swedish linguist Malmberg

presents examples of speech he heard while traveling in Córdoba. In his notes he represents the prosodic characteristics of the dialect by using an acute accent mark in the syllable preceding the tonic, for example, in *café* [káfe] and *comida* [kómida] and cites the phenomenon more generally as a stress shift. Malmberg suggests that this lengthened vowel is also accompanied by a high tone and the displacement of the accent *expiratoire* or “exhaling,” the latter being the essential characteristic of this phenomenon (1950:219).

While Malmberg calls this phenomenon a stress shift, the well-known Argentine linguist Vidal de Battini (1964) labels it *un acento musical* or “a musical accent” and makes the observation that the vowel lengthening, combined with a tone height change is so perceivable that it often creates the sensation of producing a geminate vowel. Other linguists have been occupied with studying and documenting the unique features of Cordoban Spanish, but they bemoan the fact that their studies are too few to give Cordoban Spanish the attention it deserves.

Catinelli begins *El habla de la provincia de Córdoba*, the speech of the Córdoba Province, by pointing out the historical influences of language contact between archaic Spanish and indigenous substrates that lend the dialect its unique character,

un matiz especial que la singulariza dentro de las demás del interior del país y por sobre todo la convierten en un paradigma más auténtico del habla popular argentina que el que puede ofrecer el cosmopolitismo extranjerizante de algunas zonas del litoral, principalmente la capital del país, o la influencia indígena unilateral de algunas de nuestras provincias fronterizas (Catinelli 1985:12).

“a special aspect that makes it singular among the rest of the interior provinces and above all converts it into a more authentic paradigm of popular speech in Argentina than that which may be offered by the foreignizing cosmopolitism from some of the River Plate zones, principally the country’s capital, or the unilateral indigenous influence of some of our border provinces” (author’s translation).

Catinelli is concerned by the lack of attention that this dialect has received relative to other varieties of Spanish in Argentina, an oversight made especially notable in view of Córdoba's long-standing university tradition. Catinelli seeks to address this void of documentation with his *Atlas Lingüístico de la Provincia de Córdoba*, which includes such linguistic topics as: phonology, phonetics, morphology, syntax, lexicon, phraseology, rhyming expressions, popular similes, colloquial expression, Cordoban humor, language and religion, and animals. Catinelli has indeed accomplished his goal of bringing attention to the linguistic features of Cordoban speech in preserving them in his Atlas. His efforts are motivated by his preoccupation with the possibility that dialect leveling due to language contact with neighboring regions will diminish the unique features of this dialect.

In his *Atlas*, Catinelli restricts the geographical distribution of the *tonada cordobesa* identified by its lengthened pre-tonic vowel to the capital city, Córdoba Capital, and the central departments or sectors. The marginal departments of the province seem to resemble the accents or *tonadas* to which they are nearest,' for instance, a northern Argentina accent influences the Valle de Traslasierra sector even though it is located within the province of Córdoba (Catinelli 1985:21). Despite the breadth of his topics and the recognition of the *tonada cordobesa*, Catinelli's *Atlas* does not expand upon our understanding of the dialect's most salient feature, the pre-tonic lengthening.

Cacciavillani (1988) describes the speech of Córdoba as it relates to the city itself, considering its historical development and organization into different sectors with different people. To this end he provides a linguistic description of speakers from various neighborhoods of the city, ranging from the periphery to the center of the city, with the intention of illustrating that the speech of Córdoba is as diverse as its neighborhoods. He

makes the point that although socially disadvantaged neighborhoods may not be host to the largest buildings and most brilliant monuments they represent and make up part of the diversity of Córdoba speech. Cacciavillani is especially interested in what he calls colloquial speech and he collects data through several methods of observation searching for specific terms or phrases, listening to spoken speech and looking at newspaper speech from particular zones in particular neighborhoods. The differences he finds are divided into three major categories: phonetic phenomena, general morphological phenomena, and semantic phenomena. He names phonetic trends for Córdoba and they include the loss of the final /s/ in words like *más*, *vos* and *vez* and the dropping of the final /r/ in infinitive form verbs (Cacciavillani 1988: 172). While these phenomena are likely to be found in other varieties of Spanish, other trends may be more unique, such as dropping of the final vowel of unstressed clitic pronouns to join with the following verb, e.g., *siba* from *se iba*). Cacciavillani also found cases of apheresis such as *lotro* (*el otro*) and *nel* (*en el*), which have also been described for Argentine Spanish in general (Carricaburo 2000).

1.1.2 Possible Indigenous origins

When it comes to dialectal variation it is often wondered what influence has led to the division of form from neighboring lects. In the case of Córdoba Spanish, the substrate influence of indigenous languages present before the arrival of the Spaniards to the region, is believed by many linguists to be at the root of its divergent forms (Malmberg 1950; Vidal de Battini 1964; Cantinelli 1985; Bixio 2001, *inter alia*). When accounting for the rhythmic aspects of the *tonada* in particular, the substrate influence is also cited by these same scholars. Cantinelli (1985) claims that the way linguistic variants are geographically distributed throughout the Córdoba province is evidence of historical language contact with indigenous groups giving rise to the unique intonation of the

tonada cordobesa. The same regions characterized by the *tonada cordobesa* were thought to be inhabited by the Sanavirones before they were pushed towards the south by invasions. Another indigenous group that is often ascribed to have influenced the Spanish of the Córdoba region is the Comechingones. However, by the time Spaniards had arrived to the area the Comechingón language is said to have already divided into two dialects, *Henia* and *Camiare* (Bixio 2001). These two dialects, along with *Sanavirón*, were believed to have different geographical ranges at the time of the Spanish invasion. These ranges cover the present day Córdoba province; *Henia* was spoken in the northwestern departments of the province, *Camiare* in the west and southwest, and *Sanavirón* was spoken in the north (Bixio 2001).

In addition to the scarce mention of the indigenous origin of the *tonada cordobesa* in published articles, some websites also make note of the possible indigenous influence on the distinct intonation of the region. The web publication from Rumi Ñawi states:¹

La sorprendente curva tonal que caracteriza el español hablado en las Sierras Chicas, Capital y Departamentos del centro de la provincia de Córdoba es herencia de la etnia comechingona

“The surprising tonal curve that characterizes the Spanish spoken in the Chicas Mountains, the capital city of Córdoba, and the central departments of the Córdoba province is a heritage of Comechingon ethnicity” (my translation).

Another relevant webpage, “La Mañana de Córdoba” (Jul. 06, 2011),² reports that many researchers believe *La acentuación y la «tonada» en cambio quizás ya habían sido marcadas por el sustrato comechingón* or “the accentuation and the accent on the other hand had perhaps been marked by the Comechingón substrate” (my translation). This

¹ <http://webs.satlink.com/usuarios/c/cilnardi/> Centro de Investigaciones Lingüísticas “Ricardo L. J. Nardi”

² <http://www.lmcordoba.com.ar/nota.php?ni=61178>, website accessed 2012-04-07

affirmation from La Mañana de Córdoba is reiterated in at least two other websites and also restated in the Wikipedia article regarding the Comechingones.³ These sources make no specific reference to the linguistic features of these indigenous languages and so this manner of influence on the modern language of Córdoba remains to be adequately explained and evidenced.

1.1.3 The *tonada*'s place in popular culture

While the origins of the *tonada cordobesa* remain obscure, the attention and recognition this dialect receives at the popular level is overtly manifested. The uniqueness of the *tonada cordobesa* within Argentina and specifically compared to that of Buenos Aires or *porteño* Spanish has been cause for the creation of popular media describing Cordoban Spanish and its *tonada* or “tune.” While the term *tonada* can refer to any accent, that of Córdoba is often referred to as a *cantito* or “little song,” which directly references the notion that it is a melody characterizing this dialect. In fact, multiple websites present a pedagogically-styled summary of how the *tonada* works, one in particular is titled “*Pequeña gramática cordobesa: Para extranjeros: reglas básicas de la tonada cordobesa*” or “Small Cordoban Grammar for Foreigners: Basic Rules to the *tonada cordobesa*.” The original webpage seems to stem from Jaworski (<http://www.vallepunilla.com.ar/gramatica.php>) and it proposes an informal guide to understanding and adapting your own speech, mostly through pointing out ways in which the people from Córdoba, the Cordobeses, deviate from *porteño* speech. The first rule mentioned in this “*Gramática*” reads as follows:

³ <http://argentina.indymedia.org/news/2011/07/785570.php>,
<http://www.redcalamuchita.com.ar/comechingones/culturas-lenguajes-dialectos.php>

*Localice la sílaba acentuada en la palabra.
canSAdo.
Ahora, Estire la sílaba anterior
caaansado.*

“Find the accented syllable in the word
canSAdo or tired,
now, stretch the preceding syllable.
caaansado,” (my translation).

Several folk attitudes demonstrating the perception of this dialect are implicit in this scant example. First, the placement of this rule at the top of the webpage directly under the title “*La pequeña gramática cordobesa ...*” imparts a prominence to this particular feature. In addition, having ordered this *regla* or “rule”, or *paso* meaning “step” as a first in a list of twelve linguistic features, the author suggests the importance of vowel lengthening for a genuine production of the *tonada cordobesa* and the saliency of this feature to speakers of other Argentine dialects, as they are the assumed readers of this website.⁴ Another type of perceptual evidence provided in the text of this first rule is the recognition of syllabic division and weight, signaling the accented syllable as an anchor for lengthening. Both the orientation to the tonic syllable and the essential role of duration made evident in this rule describe this phenomenon in very much the same way as the previous linguists documenting pre-tonic vowel lengthening, only with more brevity and more humor. The insight to the pre-tonic vowel lengthening phenomenon is limited to these few lines. No other linguistic or social detail explains the production or perception of this variable and the many other authors who seem to recognize the

⁴ The remainder of the list reminds us that lengthening does not occur when the stressed syllable is located at the beginning of the word (#2), definite articles may be used with first names (e.g., *La Susana*) (#3), /s/ may be elided or aspirated (#4, 5, 6), the pronunciation or orthographical *y* and *ll* is palatalized /j/ (#7), the /r/ is assibilated and not trilled (#8) and so on.

defining potential of this feature for the *tonada cordobesa*, lack evidence and understanding of its role.

While the idiosyncrasies of the speech of Córdoba seem to be broadly known and understood at this popular level, there have been only a handful of researchers who have mentioned the intonation or prosody of the Córdoba dialect in their work. To date, only two linguists, Fontanella de Weinberg (1971) and Yorio (1973) have investigated the *tonada cordobesa* beyond simple commentary.

1.2 THE ISSUE

While there are some impressionistic observations characterizing the unique prosody of the *tonada cordobesa*, there are also ubiquitous popular stereotypes about the speakers who employ it. To date there has been no systematic empirical or controlled experimental study of the peculiar intonational curves nor of listeners' ability to accurately discern it. Therefore, this work draws on acoustic and sociolinguistic methods in presenting an informed profile of this phenomenon.

This project has a two-fold aim: the first is to ascertain whether listeners can identify the Cordoban dialect and the second is to determine what acoustic features are most salient in the recognition of this dialect. The goals of the project are achieved with a perception experiment examining dialect identification and an acoustic analysis of speech samples provided from a variety of Córdoba speakers. In its multi-faceted approach to the examination of *la tonada cordobesa*, the dissertation adds to discussions of Spanish intonation, which is relatively unexplored. It also has implications for the dissociation and saliency of specific acoustic properties of intonation and prosodic contours across varieties of the same language.

1.3 OUTLINE

This first chapter serves to present the themes of the dissertation and give a brief but contextualized description of the *tonada cordobesa* and its history in the speech of Córdoba. Chapter 2, “Acoustic Studies” begins the linguistic description of the *tonada*, and broadens the previous prosody and intonation research in Argentina. It also provides the potential for contact between dialects, which is of primary interest in this research. Chapter 3, “Perception studies” develops the topic of speech perception, from the processing of the speech signal to the methods and theories concerned with speech perception. That chapter draws specifically from studies of dialect perception and intonation and prosody perception. An introduction to the general methodological approach of this dissertation leading to the experimental studies presented in chapters 4, and 5, “Dialect Identification,” and “Acoustic Analysis of La *tonada cordobesa*,” respectively. Each of these chapters is structured similarly. First, the objectives inspiring that particular experiment are outlined, including the research questions and hypotheses as well as any previous relevant studies and second, the methodology is detailed followed by a presentation of the results and a discussion of their implication. A summary of the dissertation is provided in chapter 6, “Conclusion,” as well as an integrated discussion of the results from the two experiments, the challenges encountered in this data collection and analysis, future avenues for continuing research in this area, and lastly, the main findings and implications resulting from this dissertation.

Chapter 2: Acoustic Research in Argentina

This chapter introduces research describing the Spanish varieties in Argentina and provides a foundational base for their study in this dissertation. While chapter 2 focuses on studies of production and chapter 3 is focused on perception, the knowledge from both types of research is informative for all questions posed in this dissertation. The present chapter begins with an introduction to the dialect zones of Argentina. Following the general discussion of the dialect regions is a lengthy review of research describing the intonational and prosodic features of these dialects, addressing their melodic and rhythmic patterns. This research is divided: the numerous studies of intonation and prosody of the Buenos Aires dialect are covered in Section 2.1.2 and the studies dedicated to the other dialects in Argentina are included in 2.1.3. The second section of this chapter, 2.2, focuses entirely on the Spanish of Córdoba, outlining the results of previous investigations into prosody and intonation of the *tonada cordobesa*. The chapter ends in section, 2.2.2, with a presentation of pilot studies by the author, which contain the most recent research of the vowel lengthening phenomenon pursued with acoustic and sociolinguistic methodologies.

2.1 THE SPANISH OF ARGENTINA

2.1.1 The division of dialect zones

The limits of Argentina stretch from the Antarctic to the sub-tropics and from the Andes Mountains to the Atlantic Ocean. This vast reach borders five countries and includes a multitude of diverse regions. It is not only the geography of Argentina that lends the possibility for the formation of language diversity. The history of the country is

that of different groups coming into contact with one another. The influence of substrate and superstrate languages on the Spanish that one hears today cannot be overestimated.

Among Argentine linguists, Vidal de Battini's contributions to descriptive work of the Spanish variation within Argentina, her dialect atlas, which qualified details for each dialect zone, has been foundational in the research that followed its publication in 1964. She divides Argentina into five different zones named for their geographical orientation within the country: the Littoral zone references the river delta upon which the city of Buenos Aires city is situated, the Buenos Aires province, most of the Santa Fe and Entre Rios provinces, and those provinces in the Pampas and Patagonia extending to the southernmost tip, Tierra del Fuego. Most of the provinces of Córdoba and San Luis comprise the Central dialect zone. The northwest corner of Córdoba is part of the Northwest dialect zone and the remaining two dialect zones are the Guaraní zone in the northeastern part of the country and the Cuyana zone at the mid-point along the Andes region, and directly across from Santiago, Chile (Vidal de Battini 1964, Illustration 2.1).



Illustration 2.1 The five dialect zones of Argentina (from Vidal de Battini 1964:83)

The dialect zones proposed by Vidal de Battini are used in the present study as there is no reason to dismiss this influential work; but these divisions still lead us to

wonder: what were the factors motivating the division of dialect zones? We do not propose to answer this question but to work within the frontiers that the atlas has laid and to continue the discovery of linguistic differences between zones. In this line of research, the majority of linguistic studies in Argentina have focused on Buenos Aires, or *porteño*, Spanish. This is not unexpected since Buenos Aires is not only the nation's capital, but also the political, economic and cultural center, port of entry, and most populated city of Argentina.

The Littoral dialect zone includes not only Capital Federal and greater Buenos Aires City, but also the province of Buenos Aires and nine other provinces covering the southern part of the country. In fact, Vidal de Battini's map shows the Littoral region as comprised of three sub-regions: *rioplatense*, *pampásico*, and *patagónica* (1964:83). The diversity encompassed in this dialect zone is extensive as it comprises a vast geographical range with multiple metropolitan centers and rural expanses. No linguist or layperson would assume that the people of these areas represent a homogenous group with respect to their language and culture. It is possible that one of the more frequent distinctions made by Argentines follows the divisions mentioned above. Speakers identify as being from Capital Federal or from greater Buenos Aires, the city. For example, a *porteño* identity would not apply to a person from the province of Buenos Aires any more than it would to a person from Patagonia, but oftentimes the Spanish of all Argentines is based on this prototype of Capital Federal. As is often recognized, the population is concentrated in this dialect zone, primarily around the city of Buenos Aires and its port continues to connect Argentina to the rest of the world. While we cannot account for the variation within the Littoral dialect zone in this study, which draws on only a very limited sample of speakers from Capital Federal, its contribution to the insecure status of

standard language is of interest, particularly in the attitudes of these speakers towards dialectal variation in general.

The standard for Argentine Spanish is believed to emanate from Buenos Aires and neighboring zones (Lipski 1994; Mackenzie 2001:156). This happens to be where the majority of Argentines and much of the national media reside (de Granda 2003; Rodriguez Louro 2013). Despite this dominance, the Buenos Aires variety of Spanish does not reach “standard” status on all accounts as it is not viewed by Argentine and Uruguay *Rio de la Plata* speakers as an ideal variety of Spanish to be taught as a second language (Bugel 2012), nor is it even deemed appropriate for written discourse compared to Peninsular Spanish which is considered more neutral. Rio Plate Spanish is seen more as an oral or vernacular variety (López García 2008). In a recent survey of Buenos Aires speakers Rodríguez-Louro (2013) reported that most interviewees describe their own variety as *contaminado* “contaminated” and not *correcto* or “correct” enough to represent a standard language form. These negative viewpoints are not unique among speakers of Latin American varieties of Spanish, as Gallardo (1978) points out, but are artifacts of a colonizing linguistic norm that continues to influence the ideology in Argentina and elsewhere. Polycentric forms characterize many varieties of Spanish throughout the Americas, but these still lack the authority retained by Peninsular Spanish as “the standard” for Spanish in the minds of speakers. The amount of variation in Spanish is not commensurate with the amount of research being done to develop and expand our linguistic understanding of Spanish.

The sections that follow, 2.1.2 and 2.1.3, focus on the intonation and prosody research that has been done on the different dialects of Argentine Spanish. While the aim here is to show the diversity of intonation features across Argentine dialects, it is

immediately apparent in reading this review that the focus of past and present research in Argentine Spanish has largely been on the variety of Spanish spoken in and around Buenos Aires. Some of this research makes reference to *porteño* Spanish, but it is worth noting that this particular variety falls within the broader category of the Buenos Aires regional dialect. Even more important is the recognition that neither the designation of *porteño* nor Buenos Aires Spanish is able to describe Argentine Spanish, as that is far too inclusive. However, we will find similarities across dialects resulting from the continual language contact within Argentina.

2.1.2 Prosody and intonation in Buenos Aires Spanish

The investigation into Spanish intonation remains a recent development in the field of linguistics. Most of the extant intonation research has been performed on the Castilian variety in Spain (cf., the many works of Face, Prieto); and while a recent increase of attention has been given to Argentine Spanish intonation (Fontanella de Weinberg 1980; Toledo 1989, 1997, 2000b; Kaisse 2001; Colantoni & Gurlekian 2002, 2004; Labastía 2006; Rodríguez 2008; Gabriel 2010; Gabriel et al. 2011; Lee 2010; Enbe & Tobin 2011; Pešková et al. 2012;), it is conspicuously focused on Buenos Aires and *porteño* Spanish, both of which have become synonymous with Argentine Spanish.

The variety and breadth of the Littoral dialect zone has definitely contributed to the diversity of studies of its intonation and prosody. However the importance of this dialect in Argentina is evidenced in the number of speakers and the number of studies dedicated to understanding the behaviors of these speakers. The findings recorded in this body of work is relevant to the present study not only in allowing a comparison to the Córdoba dialect, but also in serving as a basis from which to investigate the influence of Buenos Aires Spanish on the Central dialect and other dialects in Argentina.

One of the earliest and most accomplished Argentine linguists, Fontanella de Weinberg, found that Buenos Aires Spanish (BAS) has less tonal difference between stressed and unstressed syllables than other varieties of Argentine Spanish (1966, 1980). BAS shows intonational features that distinguish it from other varieties of Spanish. These features occur for different types of phrases, including broad focus declarative utterances in which all information within the utterance is considered new, or stated for the first time as opposed to a statement putting focus on one of the words or asking a question. We can take an example, *Diego compraba una manzana* or “Diego was buying an apple” to show the way intonation or pitch, is realized in this type of utterance to characterize this variety. In this case, the alignment of pre-nuclear pitch accents and the peak or highest point of the tone aligned with the stressed syllable /pra/ of *compraba* is found to be consistently aligned within the stressed syllable (Colantoni & Gurlekian 2004). Other varieties of Spanish might find late alignment in this type of utterance, where the pitch peak occurs just after the stressed syllable and partially over /ba/ of *compraba*, which is in pre-nuclear position in the utterance. The word *manzana* is in nuclear position. To illustrate the difference between alignment within the stressed or tonic syllable and late alignment in the post-tonic syllable, examples of pitch tracks from Peninsular Spanish, which would be also typical for most Latin American varieties of Spanish, are shown in Figure 2.1. Tonic syllable alignment (the bottom illustration) is typical for Buenos Aires neutral focus, while it is used in other varieties of Spanish to mark narrow or contrastive focus. Late alignment (the top illustration) is typical for Peninsular and other varieties of Spanish for neutral focus, and does not occur for Buenos Aires Spanish in nuclear declarative utterances.

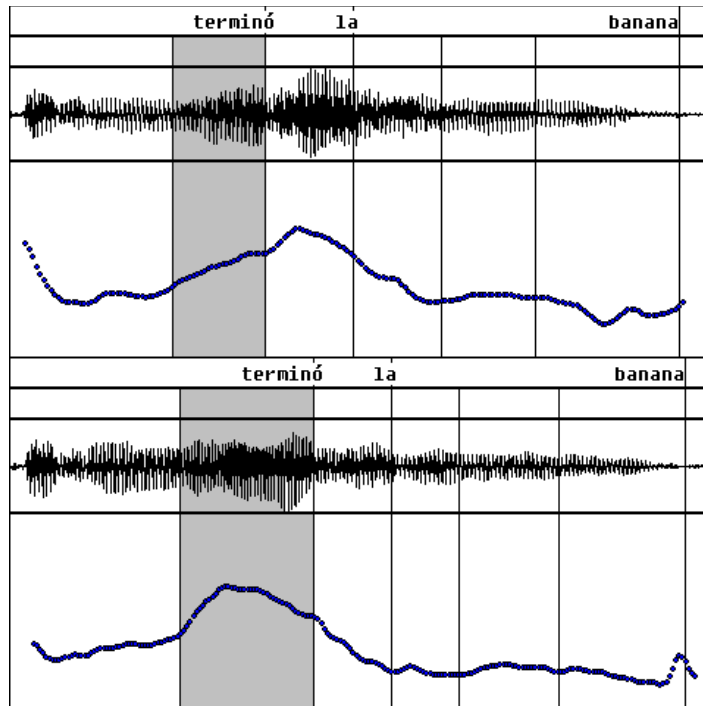


Figure 2.1 Pitch track of the broad focus declarative *Terminó la banana*, “She finished the banana” (top) and with narrow focus on the word *terminó* or “bottom” (from Face 2011, “Perception of Castillian Intonation”)

Another feature accompanying this gesture in BAS is a low tone that is aligned within the stressed syllable in the nuclear accent (Colantoni & Gurlekian 2004). The nuclear accent in our previous example would be /sa/ of *manzana*, which is the stressed syllable in the last element of the utterance. After reaching its peak, a low tone would be reached within /sa/, the stressed syllable. The result of this is the pronounced fall in the final contour of statements. Kaisse (2001) denominates this compressed falling pitch as the long fall, and recognizes that it happens in broad-focus declarative utterances. The most common discourse context for this type of fall is in a discontinued or implied list, in which a speaker feels it unnecessary to continue the list or description. Kaisse (2001) describes the long fall as a high tone on the most prominent syllable of a phrase

combined with a fall to a low tone within that same syllable, or an H* + L pitch accent. One of the unique characteristics of this contour is that the fall occurs on the salient syllable, even if it is followed by unstressed syllables (2001:147). Often times, the salient syllable is greatly exaggerated in duration, up to five times the length of the surrounding syllables. The long fall is found in other contexts with a plain declarative melody when adding a relevant or focused piece of information, and also on positive evaluative adjectives such as *¡Qué bueno!* “How great!” This intonation melody seems to require that there be either a steep fall or exaggerated length. The pitch range can be large, which is even further exaggerated if the accented syllable occurs towards the end of the prosodic phrase or boundary tone (L%). The increased duration of the accented syllable was measured for the vowel only, and on average showed a 3 to 1 proportion of lengthening as compared to non-accented syllables (Kaisse 2001).

In more recent work on BAS intonation, Colantoni (2011) expands her research design and questions to include multiple dialects of Argentine Spanish, some of which are also contact varieties of Spanish. She compares BAS with another contact variety, North Eastern Argentine Spanish (NEAS), which is in contact not only with Guarani, but also with two non-contact varieties, Central and Western Argentine Spanish (CAS and WAS, respectively) as well. Colantoni (2011) finds that BAS does indeed differ from other varieties of Argentine Spanish in the alignment of peaks and valleys in pre-nuclear accents, in the realization of the nuclear fall, and in duration patterns. These differences are attributed to contact with Italian. Specifically, BAS has the lowest ratio differences of tonic to other syllable durations. Even though the degree of tonic/pre-tonic ratio is less than that of the other varieties with a longer tonic syllable (Colantoni 2011), the tonic is longer than the post-tonic and the pre-tonic for this variety.

Lastly, in the research describing Buenos Aires Spanish intonation, Labastía (2006) describes how prosodic prominence contributes to the uniqueness of this dialect. In Spanish focal prominence is generally limited to the nuclear position, which is the last lexical item at the end of an intonational phrase; its preferred position being the rightmost end of the phrase is confirmed by Sosa (1991). Labastía also found that Argentine Spanish prefers to keep focal accent on the final constituent and also to segment speech into small intonation units to give prominence to individual words rather than grouping them in longer units. Syntactically Buenos Aires Spanish does not seem to deviate from other varieties of Spanish in the marking of focus, placing emphasis or adding focal prominence. However, pitch is employed uniquely in this dialect to achieve these effects. In addition, broad focus declarative utterances and focused-like pitch contours differentiate the realization of neutral intonation. The intonational features characterizing Buenos Aires Spanish should be considered when analyzing other varieties within Argentina, as they are and have been historically in contact with this dominant variety, whose linguistic influence is undeniably real.

2.1.3 Linguistic studies of Córdoba Spanish

In contrast to the increasingly abundant studies on Buenos Aires Spanish, there has not been systematic study of the sound features of dialects outside of the Rio de la Plata region, and previous research very rarely includes experimental or sociolinguistic approaches. While the capital city of Córdoba is second to Buenos Aires in size and rivals it in historical significance, only a handful of studies have been devoted to its unique dialect. In this section, we will report the methods and results of the linguistic studies that focus on phonetic features of Córdoba Spanish. The following section, 2.2 is devoted entirely to the studies specific to Córdoba intonation and prosody.

The palatal fricative /j/ is a popular object of linguistic study in the Spanish of Argentina as the production of this sound as an alveopalatal fricative [ʝ~ɟ] is particular to the speech of Argentina and Uruguay, and thus commonly referenced as a salient dialect marker in the pronunciation of orthographic *y* and *ll*. The voiced [ʝ] and devoiced [ɟ] variants of this phoneme have been found to differentiate speaker groups along socially determined lines in a long line of studies within the Littoral dialect.⁵ Outside of this dialect this feature is much less well described. A few studies address the pronunciation of the palatal fricative in Córdoba Spanish among other phonetic phenomena, including Prevedello & Federico (1991); Castellani (1998); and Colantoni (2005, 2006, 2011).

Castellani (1998) compared speakers of different ages and genders from Córdoba, Buenos Aires, Rosario, and Tandil, a small town in the Buenos Aires province, with respect to their voicing of the palatal fricative [ʝ]. The group with the highest rates of voicing was from Córdoba and included both males and females. Females of the combined regions produced the voiced and partially devoiced variant at a higher rate than the males. In addition to the preference by males, the voiceless variant was used more frequently by speakers in larger more prestigious cities and by younger speakers (Castellani 1998).

Prevedello and Federico (1991) studied the same assibilated [ʝ~ɟ] sounds as well as the realization of the /y/ as a voiced fricative palatal [j], which was considered the norm in the upper social classes of Córdoba, while realization of /y/ as a palatal vowel [ʌ] was more associated with the lower classes. The *rehilado palatal* also occurred but it is

⁵ The zeísmo studies include Wolf and Jimenez (1977); Fontanella de Weinberg (1985); Chang (2008); Rohena-Madrado (2013) among others.

not associated with a social stigma. Prevedello and Federico also claimed that the assibilated fricative /r/ was characteristic of Cordoban Spanish up until a short time preceding her 1991 publication, and that the more prevalent pronunciation was that of the trill, [r], similar to Buenos Aires. The aspiration of the /s/ before a voiceless consonant was reported for all levels of social groups in Córdoba, and being so widely distributed across social class and register, was considered an unstigmatized feature, contrary to the aspirated s in Buenos Aires Spanish (Prevedello & Federico 1991).

Colantoni's 2005 study addresses the linguistically important and acoustically salient process of assibilation that is affecting Argentine speech and its movement to the interior dialects as it appears to stem from Buenos Aires Spanish. She discusses the distributional trends of the assibilated palatals (AP) [ʒ, ʃ] to the non-assibilated palatals [j, ɲ, ʎ] the former being new sounds that were more recently assibilated (Colantoni 2005). In Córdoba, the more prevalent pronunciation is now that of the trill, [r], similar to Buenos Aires. Colantoni also concludes that the assibilated rhotics [r̄, r̄̄] are being replaced by the new non-assibilated rhotics [r] (2005). The overall trend shows assibilated palatals as spreading into new dialectal areas in Argentine Spanish, while assibilated rhotics are being replaced by trills (2005:315). The palatals and rhotics may co-exist in their assibilated form but Colantoni hypothesizes that an eventual change will lead to the substitution of assibilated rhotics by non-assibilated rhotics, while non-assibilated palatals will be replaced by assibilated palatals. I understand this as resulting in a phonetic inventory that would be much more similar to BAS, as these characteristic dialectal features would be leveled out.

In another study that used an experimental approach to measure the acoustic features of palatals and rhotics, Colantoni (2006) focuses on speakers from other regions

of Argentina, Corrientes, San Juan, Misiones, and Entre Rios. She drew her data from recordings made between 1994-1997, collected by means of a dialectological oral survey and sociolinguistic interviews with speakers from these aforementioned provinces, which are within the Guaranítica dialect zone (Corrientes, Misiones, part of Entre Rios), the Littoral zone (part of Entre Rios) and the Cuyana and Northwest zones (San Juan). Colantoni found an overall high degree of voicing of the palatals in all the regions and the results partially confirm that innovative varieties exhibit an increasing degree of periodicity in palatals accompanied by a decreasing degree of periodicity in rhotics.

Further dialectal varieties are included in a more recent study from Colantoni (2011) that focuses on intonation and the comparison of contact and non-contact varieties of Argentine Spanish. The contact group includes the Italian contact variety of Buenos Aires and the Guaraní contact variety from Northeastern regions, and the non-contact group included Western San Juan and Córdoba Spanish. The aim of the study was in discovering whether BAS actually differs from both contact and non-contact varieties. The Northwestern contact dialect showed the most inter-speaker variability and the least pronounced nuclear fall (i.e., a high proportion of H tones within the stressed syllable and a small proportion of L tones). In Western San Juan (and Córdoba to lesser degree) there was a relatively high proportion of peaks and valleys aligned within the stressed syllable. In all dialects, the tonic syllable was longer than the pretonic but the proportions were different. In Córdoba the ratio has a wider range of variation due to two speakers in the sample who exhibit typical pre-tonic lengthening, which is always longer than the tonic. BAS had the highest degree of final lengthening, meaning the post-tonic syllable was almost as long as the tonic syllable and in WAS the tonic syllable seemed to be longer than both the pre-tonic and post-tonic, which is consistent with Vidal de Battini's

observation of the same dialect (1964). The Spanish-Guaraní contact variety of the Northeast did not differ from other Peninsular or Latin American Spanish varieties in the alignment patterns of prenuclear accents. Strangely, both BAS and Córdoba Spanish have falling contours, differing from Northeast Spanish and Western San Juan but may differ in the timing of the fall, since peaks are aligned later in Córdoba than BAS. Additionally, both BAS and Córdoba show the steepest slopes. Córdoba Spanish has a rapid fall from an already downstepped peak and in BAS the peak is relatively higher (Colantoni 2011).

Colantoni's work has been the only one to rely on non-impressionistic measures and empirical evidence for the phonetic and suprasegmental variation of dialects outside of Buenos Aires. The tonal contours, alignment, and syllable duration illustrate unique realizations for the different dialects within Argentina, and the phonetic pronunciations of the palatal fricative, /j/, account for different phonemes and degrees of voicing to differentiate the dialects from each other. The remaining descriptive work for dialectal variation is presented separately in the following section and focuses specifically on the Northwest region in which the province of Tucumán is situated. Tucumán Spanish is of special interest in this study and its speakers are included in the perception tests and analysis.

2.1.4 Linguistic surveys of Northwest Spanish

The northwestern zone, as representative of one of five major linguistic areas of Argentina, generally combines the provinces Jujuy, Salta, Tucumán, Catamarca, La Rioja and Santiago del Estero. While this area continues to be referred to as the northwest and does share many linguistic features, Fernández Lávaque and del Valle Rodas (2003) point out an important distinction that is often over generalized, the influence of indigenous languages on the Spanish spoken over this large area. Combining such a large

geographical area together may risk omitting any presence of *Quechua* in the Spanish of more specific areas within this expansive region, which is considered within the linguistic territory of past *Quechua* dominance.

Upon the arrival of Spaniards to the area in the 16th century, Quechua use became more widespread and as the *lingua franca* among indigenous languages it also diffused culturally and through missionaries. By the end of the 18th century Quechua was commonly used by both Spaniards and indigenous peoples in their interrelations. The long period of bilingualism, lasting into the 20th century gave over eventually to Spanish. Spanish in the present northwest includes aspiration of implosive /-s/ and the elimination of final /-s/ which were previously thrown out in the central zones through a monocentric standardization process, modeled after the urban areas (Fernández Lávaque & del Valle Rodas 2003). Additionally, the loss or relaxation of final position /-r/ in spontaneous, colloquial discourse, diphthongization in hiatus, *Seseo* (the use of /s/ for both *c* and *z* graphemes); and *yeísmo*, (the merger of orthographic *ll* and *y* as one phoneme) are named as linguistic features common to the Spanish of the northwest region (Rojas 1980, 2000 for Tucumán; Fernández Lávaque & del Valle Rodas 2003; Martorell de Laconi 2006 for Salta). Often interpreted as an influence from Quechua, the closing of unstressed *e* and *o* may occur in the northeastern dialects. For instance, *e* is closed to *i* in words such as *cochi* (*coche*) or *podimos* (*podemos*) (Rojas 2000).

The palatals and rhotics are also marked by variants specific to the Northwest dialect, and they vary within this dialect as well. The multiple /r/, a multiple vibrant in standard Spanish, represented orthographically as *rr*, is deeply assibiliated in all of the northwestern populations, with no real sociocultural variation (Rojas 2000). Rojas also states that the pronunciation of the graphemes *ll* and *y* vary between Salta, Jujuy,

Tucumán, and Catamarca. In general however, the semiconsonant [j] is pronounced by speakers of lower classes, and those older than 45 years as well as all ages of people living in the interior regions of the provinces (non-urban), sometimes alternating with pronunciation of the [ʒ] which is more frequent among middle and upper class speakers in all parts of the zone (Rojas 2000).

According to Fernández Lávaque and del Valle Rodas (2003), the Spanish in Argentina underwent two parallel processes, a national standard norm from Buenos Aires and a regional norm. The regional norm was characterized by its acceptance of particular features from the national standard. For the northwest dialect these include the voseo verbal and the *yeísmo rehilado* (assibilated *yeísmo*), or use of the alveopalatal fricative [ʒ] in place of the palatal [j], as well as a gradual and increasing extended multiple vibration of the traditional assibilated fricative /r/, characteristic of the northwest. Based on the evidence from these descriptive and comparative studies, the dialects outside of Buenos Aires, including the Central and Northwest dialects, appear to be diverging in some features from Buenos Aires Spanish; for instance, in voicing the alveopalatal fricative [ʒ], which is increasingly devoiced in BAS [ʃ]. It is also converging on others, such as the trill [r] in place of the assibilated variant.

With notable exceptions, the previous work was performed impressionistically and is merely descriptive, listing the features of Cordoban speech as they deviate from standard Spanish. While the previous research on Buenos Aires Spanish intonation reveals several features describing its production, none of the aforementioned studies have investigated how the intonation of this dialect is perceived acoustically or socially. The Littoral zone dialect has received the most attention for all types of linguistic study,

but there still exists a gap of knowledge found in other Spanish dialects and indeed other languages, opposite to the production of language, and that is language reception.

2.2 THE TONADA CORDOBESA

2.2.1 Prosody and Intonation

Fontanella de Weinberg (1971) and Yorio (1973) define the *tonada cordobesa* by its pattern of lengthening the syllable immediately preceding the last accent of the intonational phrase. This pattern is exemplified in the segments shown in (1) and (2) below, with stress marked by an acute diacritic and lengthening marked by a colon.

(1) *No la co:nózcó* or “I don’t know her/it.”

(2) *Quedáte a cenár con no:sótro⁶s* or “Stay and have dinner with us.”

Both Fontanella de Weinberg (1971) and Yorio (1973) describe this phenomenon as a pattern of lengthening of the syllable immediately before the last accent of the whole segment. Note that in her discussion, Fontanella de Weinberg renames segment as macrosegment, which includes the sequences between rhythmic cuts or pauses that correspond to an intonational curve. This would be referred to as an intonational phrase in intonation literature (Gussenhoven 2004). This pattern is made rare by the fact that the lengthened syllables in (1) and (2) are in the pre-tonic syllable (or one syllable before the stressed); or tonic syllable which is not expected for Spanish, or for a language where stress realization is correlated with an increased duration (Hualde 2002; Gussenhoven 2004). According to Yorio, whose study of Cordoban Spanish investigated multiple phonological variables, vowel lengthening is the most remarkable feature of this dialect (1973:111). Indeed this feature appears to be unique among dialects and other languages;

⁶ The stressed syllable in *quedáte* indicates a preference for voseo, common in most of Argentina.

in fact, pre-tonic vowel lengthening as a socially indexed feature has only been found by the author to occur in one other variety of language. In some East Slavic dialects the pre-tonic vowel is lengthened to approach or surpass the duration of the tonic syllable (Bethin 1998; 2006; 2010).

Importantly, in the *tonada cordobesa* lengthening is believed to be accompanied by tonal movement, or at least tonal contrast occurring on the lengthened vowel (Fontanella de Weinberg 1971). Specifically, lengthening is accompanied by a tonal ascent or descent on the second half of that vowel and even in cases where the tonal height did not change, there was still tonal contrast of the lengthened vowel. She connects tonal movements to her idea of accent in the macrosegment, creating a set of descriptors that account for all possible tonal movements related to the lengthened vowel, which she admits is complex. Fontanella de Weinberg defines the macrosegment as having either strong or weak accents and four possible positions of tonal contrast: initial atonic syllable, first tonic syllable, last tonic syllable, and absolute final syllable. These last two types are obligatory in every macrosegment. In these points, the tonal contrast could be low, medium, high, or extra-high, and they interact with final tonal inflections, which may be falling /↓/, rising /↑/, or flat and before a pause ///. The numbers shown in example (3) refer to two of the four tonal contrast levels (medium and extra-high), and simultaneously the pitch movement on the lengthened pre-tonic syllable /co/ of *conozco*. The final number (1) refers to the final tone of the utterance, which, as shown by the down arrow, has a falling intonational contour.

3) 1No la 2_4co2nózco1 ↓

Fontanella de Weinberg also suggests that when pre-tonic vowel lengthening occurs, this syllable and all those that follow it become the nucleus of the macrosegment

or intonational phrase. This would make the pre-tonic and tonic syllables and any post-tonic syllables the combined center of not just the lexical pitch contour but the principal pitch movement of the intonational phrase. When the vowel lengthening phenomenon does not occur, the nucleus remains in the last tonic syllable. Over half of the macrosegments in her database contained a word with pre-tonic vowel lengthening and the majority of those had rising tonal movement for the lengthened syllable, leaving only a few of them showing falling intonation (Fontanella de Weinberg 1971:20).

Yorio's (1973) extended description of the *tonada cordobesa* agrees with Fontanella de Weinberg's findings on some points, including the application of pre-tonic vowel lengthening to words that are more than one syllable and where the stress is not in the first syllable. Yorio still finds exceptions in which this rule can apply across word boundaries, shown in the single two cases in examples (4) and (5).⁷ Note that in the previous examples, the lengthened vowel is followed by a colon while stress is marked by the acute accent).

4) *a: mí* "to me"

5) *para: mí* "for me"

(Yorio 1973:74)

Pre-tonic vowel lengthening is described as "a redistribution of strength, from the tonic syllable to the pre-tonic syllable, which, though unstressed, becomes longer and higher in pitch than the stressed syllable that follows it" (Yorio 1973:30). However, this statement is not meant to agree with Malmberg's denomination of the pre-tonic vowel lengthening in the *tonada cordobesa* as a stress shift. Yorio (1973) instead maintains that

⁷ Yorio does not explain how the stress in the first syllable of *para*, /pa/ in example (5) is affected by this lengthening.

the tonic syllable retains a falling tone that characterizes it as stressed while the tone rise associated with the lengthened pre-tonic vowel has a level tonal quality.

Yorio's (1973) analysis of the vowel-lengthening phenomenon in the form of a set of rules mostly follows the constraints described by Fontanella de Weinberg, including the general finding that pre-tonic lengthening occurs at the end of a breath group or macrosegment much more frequently than any other position. At the same time, Yorio disagrees with Fontanella de Weinberg's statement that its occurrence in other phrasal positions is very infrequent (1973: 80). Additionally, he did not find cases of the pitch falling when the vowel was lengthened as did Fontanella de Weinberg. Rather, pre-tonic lengthening was found to occur before all stressed syllables, regardless of their position with respect to the main intonation focus of the sentence (Yorio 1973:30). While Fontanella de Weinberg (1971) believes that vowel lengthening is only occasionally employed in non-final phrasal position, it is semantically driven to show emphasis. Yorio separates this type of lengthening from emphatic lengthening, stating that the vowel lengthening associated with this accent has absolutely no semantic connotations (1973:73). Finally, Yorio completely disagrees (with Fontanella de Weinberg) that vowel lengthening can optionally occur on an already stressed vowel, as Fontanella shows with this example using the words *no:che* and *a:ño* in final phrase position. As the examples of lengthening make apparent, there are no lexical limitations to the phenomenon, which seems to occur across all word classes.

Further discussion of the intonation of the *tonada cordobesa* was the topic of an unpublished 1982 thesis by Laura Peyrano "*La entonación en el habla de Córdoba desde una perspectiva integral*" or "A Whole Perspective to the Intonation of the Speech of Córdoba," (my translation) cited in Viramonte de Ávalos (2000). Peyrano believed the

rhythm of this intonation to be syllabic and much slower than that of Buenos Aires or Rosario; and Peyrano agrees with the four tones described by Fontanella de Weinberg, adding that the *bajo* and *medio* or “low” and “medium” tones describe what is generally heard. Only for an increased expression of emotion do the tones reach to level four, *extraalto* or “extra high.” (Peyrano 1982; in Viramonte de Ávalos, 2000). In addition, Peyrano cites the lengthening or gemination of the pretonic syllable as the most notable phenomenon in this regional variety.

An important question that arises from these descriptive accounts of the *tonada cordobesa* is when pre-tonic vowel lengthening occurs in the speech of a *cordobés*, and if this use correlates with syntactic or intonational phrasing. Fontanella de Weinberg’s description provides four possible tonal contrasts for the lengthened syllable and how these interact with two different final tone movements. Her work, however, does not analyze how the lengthened pre-tonic syllable interacts with the rest of the phrase. For example, does pre-tonic vowel lengthening tend to occur in certain types of intonational phrases or is it limited to specific syntactic structures?

Yorio’s account of the *tonada cordobesa* is expressed as a set of rules limiting the syllabic and phrasal positions in which pre-tonic vowel lengthening was most likely to occur. Most importantly, Yorio’s rules similarly find pre-tonic lengthening before all stressed syllables, regardless of their position with respect to the main intonation focus of the sentence, (1973:30) also disagreeing that this type of lengthening is necessarily emphatic. His conclusions ultimately imply that lengthening may be optionally applied in speech. Yorio illustrates this by comparing two speaking styles in his analysis. The results of his study are drawn from the recorded conversations of 11 informants in two different styles of speech, Reading Style and Conversational Style. Pre-tonic vowel

lengthening seems to be more frequent in the position preceding the last stressed syllable of the breath group (75.3% occurrence in reading style), and is nearly obligatory in conversational style (93.4%). In other positions the results were 50.3% for reading style and 73.2% in conversation style. Overall, the lengthening of the unstressed vowel and raising of its pitch when it precedes a stressed vowel of the same word is widespread in both styles of speech (Yorio 1973). Lastly, in the unpublished thesis of Laura Peyrano on the intonation of the *tonada cordobesa* this variety is believed to show diastratic variation, in that it is more accentuated in the lower classes and more attenuated in the higher classes (Peyrano 1982; in Viramonte de Ávalos 2000).

The studies performed by Fontanella de Weinberg and Yorio provide insight and detail into the study of the *tonada cordobesa* but are naturally very limited in scope since they represent only two inquiries into a potentially complex phenomenon. They are further hindered by their impressionistic methodology, which relies on one listener's ability to differentiate between rising tone and increasing duration. Impressionistic observations may not be able to accurately capture the interplay of duration and pitch, nor other prosodic features that are possibly relevant to either the production or perception of this linguistic feature. Unarguably, the study of intonation and prosody benefits from the more accurate and precise measurements made possible with modern recording devices and voice software.

2.2.2 Pilot studies

The most recent project specific to the pre-tonic vowel lengthening in Córdoba, and the only study using acoustic measures is the author's pilot study (Lang 2010), which measured duration, intensity, and average pitch (F0) for the pre-tonic and tonic vowels of 47 speakers. In that study, native speakers of Córdoba Capital were recorded producing

both spontaneous and read speech, and tokens were selected from multisyllabic words, without syllable-initial stress, in final phrase position. To control for intrinsic vowel duration differences, only words where the vowel was the same in the pre-tonic and tonic syllable (e.g., *pasado*) were included as tokens. These were submitted to Praat and segmented, dividing the consonant and syllable of each test syllable. The duration, average intensity and F0, through the duration of the segment were noted in text grids and analyzed with a series of matched-pair T-tests. For duration, the pre-tonic vowels averaged 131 ms and the tonic vowels were 128 ms, resulting in a non-significant difference ($p=.69$, $n=162$). The fact that these two vowel durations are not significantly different indicates that the pre-tonic vowel is lengthened when it should be significantly shorter than the tonic vowel. The measure of average intensity between the pre-tonic and syllables was also non-significant, while pitch showed a significant difference for the tonic syllable, 167hz vs. 148hz for the pre-tonic syllable ($p<.01$).

The examination of these prosodic features was analyzed for different speaker groups to discover how this phenomenon might be socially conditioned. Sex, age, social class of the speaker and whether he or she is speaking spontaneously or reading aloud were some of the identifying features of the different speaker groups. The measure of vowel duration taken for the pre-tonic and tonic vowel of each token word, was used to create an indicator of pre-tonic vowel lengthening. This was done by converting these two values into a single, continuous value, representing the percent change of duration from the pre-tonic to the tonic vowel [$\text{tonic ms} - \text{pre-tonic ms} / \text{pre-tonic ms} * 100$] (in units of duration, milliseconds). Thus, a negative percent duration meant the pre-tonic vowel was indeed longer than the tonic and hence more characteristic of the vowel lengthening phenomenon. The greater the percentage, the greater the difference was for the two. A

positive percent duration indicated that the tonic vowel was longer as expected for standard Spanish.

The new variable, percent change vowel duration, was tested with several two-way ANOVAs which indicated some significant differences between speaker groups. When grouped by sex, working class males behaved significantly differently from females. Females retained a high percent change vowel duration, meaning their tonic vowels were markedly longer than their pre-tonic vowels and more standard-language sounding. The males, however, leaned towards longer pre-tonic vowels, or a more typically Cordoban-sounding pattern. Another post-hoc LSD test performed on a two-way ANOVA found a significant difference of speech style for the two different social classes. Upper-middle-class speakers had a more extremely negative percent change duration (i.e., longer pre-tonic relative to tonic vowel) between conversational style and story-telling style, showing a higher average percent change duration between the classes from about -17% to +17% for upper-middle-class and from -8% to +11% for working-middle-class.

The results of this study point to only a few sociolinguistic factors that condition pre-tonic vowel lengthening: sex, social class, speaking style and interactions. However, it is limited in scope to the production of adult speakers in the capital city, examining only the distribution of pre-tonic vowel lengthening among broadly defined populations, while observations suggest that the region and speakers representing the *tonada cordobesa* are more diverse and their interactions more complex. Nevertheless, as the only linguistic study to employ modern methods of prosodic measurement and sociolinguistic methodology, it provides a starting point for the present study and future studies of Cordoban Spanish.

The results from the pilot study raise many more questions about how and why pre-tonic vowel lengthening is realized, and they do not accurately describe tonal movement or explore how vowel lengthening is perceived and what it indexes. These objectives are the primary focus of the present study. The present study will examine the production and perception of pre-tonic vowel lengthening as it influences dialect categorization and language attitudes towards these speakers.

Chapter 3: Perception

Speech behavior is often divided into two complementary halves: production and perception. The former describes the articulation of speech, the acoustic signal that is produced, and the contexts in which it is produced, which may be linguistic contexts, social contexts, or social characteristics describing the speaker. Linguistic production is captured and analyzed directly by the linguist but is considered to be more meaningful when it is interpreted along with its complementary half, perception. The perception of speech involves its processing by the listener. The acoustic signal and the contexts mentioned above are still relevant, but this linguistic output is studied as it is processed by the listener. In this chapter we discuss the processes of speech perception that are relevant to the perception experiment used in this dissertation.

Speech perception is a complex behavior that is believed to execute two types of processes simultaneously: bottom-up and top-down processes, or simply put, those depending on the speech signal and those depending on knowledge and meaning. The two main objectives of this dissertation are to study the influence of both acoustic and attitudinal knowledge on the perception of the *tonada cordobesa*. Therefore, these two types of processing are important to the foundation of this study. Section 3.1 focuses on the processing involved in speech perception, while section 3.2 presents some of the research investigating the perception of suprasegmental features such as intonation and prosody and describes some of the theories and methods used in experimental perception studies. Throughout this chapter, examples will focus on the perception of dialect or regional identity. While this dissertation combines the confluence of prosody perception and dialect categorization, this literature review is intended to illustrate the different sides to the theories and methods of investigating perception.

3.1 SPEECH PERCEPTION

The process of speech perception and any perceptual process implicates multiple components. There are numerous processes involved in the analysis of the speech signal that draw upon sources of knowledge and multiple levels of representation. What is perceived is considered a conscious sensory experience, while recognition involves a step beyond this as it involves placing objects into categories that have meaning. For instance, one might perceive a linguistic variant in a foreign language, but if it is not meaningful to the speaker it is not recognized. Consider, for example, an English speaker confronted with a Spanish trilled *r*, [r̄] instead of a flap [r]; this distinction is not recognized since it is not associated to a meaningful category. Once an object is both perceived and recognized, behavior or action finalizes the perceptual process.

There are several issues of concern with this process when speech is the object of perception. Arguments for processing based solely on the acoustic signal are also called bottom-up processing. For instance, the modularity thesis from Fodor (1983) and Liberman and Mattingly (1985) argues that speech is processed in a specialized module, differently from non-speech sounds and the perceived object is the gesture or articulatory event rather than the acoustic event. Evidence has also been found for language processing based on knowledge and meaning, also known as top-down processing (Ganong 1980). Recent research continues to confirm the influence of top-down processing on the bottom-up processing of acoustic signals in studies such as Niedzielski (1999), Hay et al. (2006), and of course McGurk and Macdonald (1976), for which the McGurk Effect is named. These studies, which are described in detail in the following section, 3.1.1, and the subsequent McGurk effect, found knowledge to dominate or override the information in the acoustic signal when the two contradicted one another.

Researchers acknowledge that speech processing is complex and interactive (Elman & McClelland, 1988; Connine 1990) and involves a simultaneous execution of both types of processing.

This dissertation takes a general approach to speech perception, (c.f., Holt et al. 2004) that considers the objects of speech perception to be auditory or acoustic events, as opposed to articulatory events, or intended gestures, and accepts that speech perception relies on both auditory events and perceptual learning, allowing the listener to categorize the imperfect perceptual cues in speech. Thus, speech processing can be thought of as highly adaptive, with listeners flexibly adjusting to the demands of the task and the properties of the signal. As a result, this processing executes both bottom-up processing of the speech signal and top-down processing of knowledge and meaning.

3.1.1 Experimental Methods and Approaches to Perception

Research from the 1930's and 1940's focused on the existence of vocal stereotypes, better known as the personality attributes based on voice that are consistent across subjective opinion, did not match with objective measures of these traits, as discussed by Bezooijen (1988). Lambert (1960) found that public, overt responses did not match people's privately held attitudes, and hence introduced the matched-guise technique (MGT) to indirectly solicit these attitudes by presenting identical information with only a change in 'guise,' or a superficial speaker characteristic without changing the speaker. Lambert's (1967) subsequent work has confirmed that dialect is an important cue in assessing speaker personality. Van Bezooijen (1988) finds that researchers became more interested in the mismatch of personality attributes and objective measures in the 1970's, which is when the attention shifted towards a social psychological approach and brought new experiments for studying stereotypical judgments (Preston 1989, 1999),

masking techniques (Gooskens 1997; van Bezooijen & Gooskens 1999) and manipulation techniques (Clopper et al. 2006; Campbell-Kibler 2009). Many of these methodologies are used to control the speech signal and are thus able to assess its effect on a speaker's perceived social attributes.

3.2 INTONATION AND PROSODY PERCEPTION

Much of the early speech perception research has focused on segmental features, such as VOT (Lisker & Abramson 1964, 1970; Eimas et al. 1970; Lasky et al. 1975; Miller 1997) or consonant voicing (Miller & Liberman 1979; Kluender et al. 1988). The perception of suprasegmental features (i.e., intonation and prosody) has been studied with the use of voice manipulation technologies, allowing for both the synthesis and elimination of pitch contours (c.f., Leyden et al. 2006, or the studies mentioned in this section). These tools permit linguistic features to be controlled and isolated and speech perception to be tested with an experimental approach. The methods to investigate speech perception continue to increase and improve; and while they may be adapted to address many types of research, those exemplified here focus on the perception of dialect.

The role of intonation in differentiating dialects is continually observed impressionistically and anecdotally. Although dialects are often remarked to have different intonations, only a limited set of studies has systematically tested dialect categorization and/or attitudes among listener populations focusing on the prosodic or intonation features specific to each regional variety. Among these studies, some claim that intonation alone is sufficient for a listener to determine the dialect of a given speaker, testing listeners on filtered speech in which phonetic information is removed and only the intonational contour remains (Gooskens 1997; van Bezooijen & Gooskens 1999; Peters et al. 2002, *inter alia*).

Peters et al. (2002) tested the categorization of three German dialects: Northern Standard, Berlin Urban Vernacular and Hamburg Urban Vernacular. Using natural speech recordings from a Northern Standard German speaker, the intonational curves were manipulated using Pitch Synchronous Overlap and Add, or PSOLA, to create two different pitch contours for the same utterance without changing spectral, or any other characteristics of the utterance. Segmental features were removed with a low-pass filter so perception was based on the intonational contour of the utterance alone. This methodology tests high-level information, intonation, rather than isolated pitch information through the language identification task. The authors found that the intonational contour alone was sufficient for listeners to distinguish a particular dialect from another. These categorizations may have been aided by their decision to include contours that were deemed characteristic of that particular variety of German. This study provides evidence for the fact that dialects may evolve to have different intonations and that intonation alone may be sufficient for distinguishing between these two dialects. Additionally, Peters et al.'s study found that the listeners' experience with and exposure to the dialects being tested significantly influenced their accuracy in identifying these dialects in this test.

Leyden and Heuven (2006) study the effect of intonational contours on Orkney and Shetland varieties of English with a series of experiments based on the methodology established by Gooskens and van Bezooijen (2002), which erases the intonational contour of speech fragments. They used two speech conditions, normal, intelligible speech and low pass filtered speech, and then applied an additional step to this methodology that eliminated the intonation contour so they could test the importance of speech melody in distinguishing between the two dialects. The results for this experiment suggest that the

intonational differences are more important for distinguishing dialect than temporal organization.

Other studies suggest that listeners require more than the intonational contour in order to identify a speaker's dialect in a perception task. In a study of Austrian dialects, the intonational contour alone, filtered using Hann pass technique, was not enough for listeners to distinguish between two varieties (Soukoup 2009; Feizollahi & Soukup 2011). Feizollahi and Soukup (2011) found that the standard variety samples consistently showed more stressed syllables and stronger break indices and perceptions that were biased towards the standard variety when utterances were longer. In addition, these samples displayed a greater pitch range, while the shorter sentences were biased towards perception of the dialect.

Just as each dialect presents a unique combination of linguistic features, each dialect study presents its own unique standpoint on the role of prosody and intonation in dialect perception. This may seem like an endpoint for this line of research, but these studies reveal consistencies in perception that are likely due to certain linguistic features being more salient in one dialect group or language than another. For instance, in this dissertation vowel duration affecting prosody is shown to influence listener perception and dialect identification for the *tonada cordobesa*.

3.3 THE INFLUENCE OF SPEAKER/LISTENER TRAITS

Sociophonetic work has demonstrated subtle influences of sociolinguistics and speech perception research. Heavily influential in this branch of research is the work of McGurk and Macdonald (1976) and Niedzielski (1999), both of which present evidence of top-down processing. Niedzielski's technique primed listeners with false information about the speaker before playing stimuli. The speaker's (false) regional origin

significantly influenced listener perception of the speaker's speech in the direction of linguistic variables that are associated with the dialect the listener believed they were hearing. The influence of stereotypes on the perception of language has been the object of many other studies in the sociology of language. To be specific, the idea demonstrated in Niedzielski's study is that listeners compensate their perceptual processes to hear output of same category through perceptual normalization (Ladefoged & Broadbent 1957; Bladon Henton & Pickering 1984; Johnson 1991).

Strand and Johnson (1996) tested the normalization of talkers of different genders discovering that the phonetic perception was shifted according to the gender of the speaker. It appears that the listeners adjusted their boundary in a categorization task of fricatives according to how prototypical voices related to their gender and how they reacted to information that is traditionally thought to signal speaker identity rather than phonetic categorization in their processes of normalization and perception. This same experiment then added visual information of a female or male face inducing listeners to shift boundaries of fricative perception in what is more similar to the McGurk effect in which speakers access expectations or stereotypes of how people should sound based on how they look. The face-gender effect from Strand and Johnson (1996) and many other studies of language perception and attitudes have since employed these techniques and report instances of the McGurk effect, if not with visual stimuli than with directly accessing expectations about a speaker's identity.

Another example of this effect is illustrated in Hay et al.'s study of perception of the NEAR/SQUARE merger in New Zealand listeners (2006). A variety of factors were found to influence the accuracy in identifying individual words belonging to these merged pairs, such as bare and beer, including perceived speaker characteristics. Two

different male and female voices were paired with photos and presented to groups of listeners. The photos presented male-female, young-old, and working class-middle class combinations, using the same speaker for the social class guises. Photos and voices were presented together allowing for all possible combinations to be divided among different listening groups. The photos did affect listener perception measure and their ability to correctly distinguish these word pairs.

Speaker traits, whether physically or psychologically manifested in perception are shown to influence listeners in a listening tasks and measures such as those mentioned. Also important are the characteristics of the listener, which may include his or her background experience. Many experiments in perception have shown listener oriented features to be an important factor affecting speech perception, including the same study mentioned above. The NEAR/SQUARE vowel merger was perceived to vary with the age of the speaker only by those listeners who make the distinction themselves. These listeners were more accurate when hearing an older speaker than a younger speaker. Those who do not make the distinction in their own speech were equally inaccurate with regards to age (Hay et al. 2006).

In the identification of speech group features, the dialect, linguistic experience and exposure to the dialect have been evidenced to improve listener performance on dialect identification tasks (Peters et al. 2002; Clopper and Pisoni 2004, *inter alia*). The goal of Clopper and Pisoni (2004) was to examine the relationship between early linguistic experience and the perception of dialect perception in American English. The homebodies and army brats study involved two listener groups of college students; the homebodies, who had only ever lived in Indiana and the army brats, who had lived in three or more different states by the time they were 18 years old. Their results confirmed

that army brats had overall better performance on the dialect categorization task and that specific experience with a given variety also produces effects on speech perception. For example, a history of residence led to better categorization of talkers from that same region. Additionally, both listener groups relied on three major dialect clusters to categorize the speakers: New England, South and South Midland and North Midland and West resulting in differences in the perceptual similarity spaces between listener groups for these regions. Preston (1993) also found differences between listener groups based on their place of residence. Listener perception of the major north-south dialect boundary varied; for Michigan listeners it was between Indiana and Kentucky and for Indiana listeners it was between Kentucky and Tennessee. Furthermore, differences in judgments of correct and pleasant English labeled by listeners on dialect maps of the US was attributed to their residential history.

The evidence from research is convincing, but the effect of linguistic exposure is still difficult to assess, especially when listener attitudes are being examined. The studies discussed in this section indicate that listener experience is expected to play an important part in the correct identification of speaker origin. The intention is to reveal how Argentines from different backgrounds and regions view the language and speakers from Córdoba. The following chapters, 4 and 5, will present the two experiments which each approach these topics in a different and unique way. Each of these chapters begins with the research questions and relevant research motivating that experiment, then continues with a detailed methodology, and lastly presents and discusses the results from that experiment. The final chapter of the dissertation, chapter 6, will discuss the outcomes of both of the experiments and the contributions and future directions of the overall research trajectory.

Before we focus on the individual experiments it is important to briefly outline the ways in which they will connect to inform each other. Together, these experiments analyze both the perception and production of vowel lengthening in the speech of Córdoba speakers. The methodology for doing so utilizes first a perception task to determine which speech tokens are consistently perceived as sounding more *cordobés* (Experiment 1, chapter 4). The results from Experiment 1 inform the interpretation of acoustic analyses of the oral stimuli, or tokens, used in the perception experiment (Experiment 2, chapter 5). The acoustic analyses are specifically concerned with discovering which prosodic and phonetic characteristics are actually associated with the perception of a Cordoban-sounding accent. This approach also involves an examination of the features— demographic, social and experiential— that describe the listeners who participated in the perception experiment and may account for differences in belief and behavior. Collectively, these experiments provide multiple standpoints from which the *tonada cordobesa* is observed and interpreted in this dissertation.

Chapter 4: Dialect Identification

4.1 INTRODUCTION

Although dialects are often described as having different intonations, only a limited set of studies have systematically tested dialect categorization and/or attitudes among listener populations by focusing on the prosodic or intonation features specific to each regional variety. Of these studies, some claim that intonation alone is sufficient for a listener to determine the dialect of a given speaker; in these studies, listeners heard filtered speech in which phonetic information is removed and only the intonational contour remains (Gooskens 1997; van Bezooijen & Gooskens 1999; Peters et al. 2002; Leyden and Heuven 2006, *inter alia*). Other studies suggest that listeners require more than the intonational contour in order to identify a speaker's dialect in a perception task, indicating that having more stressed syllables, longer utterances, and stronger break indices are necessary for categorization (Soukup 2009; Feizollahi & Soukup 2011). While the same results are not expected for perception of the Córdoba dialect, the rhythmic patterns, particularly the lengthening of the vowel in pre-tonic position, are expected to influence dialect perception. Listeners perceive this lengthening as a stress-shift (Malmberg 1950), and testing this feature experimentally and in isolation is an innovation that allows for a more controlled investigation of dialect perception.

The Dialect Identification task tests the perception of the *tonada cordobesa* and specifically the role of vowel lengthening in the categorization of speaker dialect. As discussed in chapter 2, pre-tonic vowel lengthening is the only feature consistently agreed upon in descriptions of Córdoba intonation (Malmberg 1950; Vidal de Battini 1964; Fontanella de Weinberg 1971; Yorio 1973). In addition, previous research conducted by

the author (Lang 2010) has affirmed that the pre-tonic vowel is on average as long as the tonic vowel in naturally-produced speech. These conclusions, both impressionistic and empirical, lead us to hypothesize that vowel lengthening is the most salient linguistic feature of the *tonada cordobesa*.

This chapter continues in 4.1.1 with a presentation of the research questions motivating this experiment and the hypotheses to these questions contextualized by relevant sources and examples. The methodology of the Dialect Identification task is presented in section 4.2. This methodology describes the speakers who recorded the stimuli, the stimuli themselves, the procedure for data collection, the participants, and the analysis of results. The speakers and participants in the present Dialect Identification experiment are the same as those who completed the Language Attitudes experiment in chapter 5; descriptions of both groups can be found in this chapter, section 4.2. The methodology section of this chapter also gives a description of the written questionnaire completed by each subject as part of their participation in these two experiments.

The results of the Dialect Identification task are discussed in section 4.3, which presents the following topics: speaker dialect accuracy, pre-tonic vowel length and Córdoba-ness, listeners analyzed by origin, listeners analyzed by experience, dialect mis-identification, and recognition and identity.

4.1.1 Research questions

Two research questions motivate the present experiment. The first is concerned with the feature of vowel lengthening, and the second with listeners' backgrounds.

Research Question (1): *Does vowel duration influence the perception of a speaker's origin, i.e. would longer durations induce a Córdoba identification, and shorter durations a Buenos Aires identification?*

A longer pre-tonic duration is hypothesized to favor perception of a Córdoba-like accent, while a shorter duration (of the pre-tonic vowel relative to the tonic) is expected to induce the perception of a non-Córdoba speaker. These hypotheses will be tested with a Dialect Identification task that uses a Matched-Guise approach to present stimuli that differ only in their pre-tonic vowel durations.

The Matched-Guise Technique (MGT) was developed by Lambert (1960), who argued that public, overt responses did not match people's privately held attitudes. The MGT consists of playing audio-recordings that are identical in all but one respect; the listening 'judges' are led to believe they are produced by different speakers, when in fact a single speaker produces a message in which a single speech characteristic is manipulated in the lab. In the present experiment, this technique is used to force listeners to rely on as few cues as possible: a single recording is used to produce 1) a natural, unmanipulated stimulus phrase, and 2) a stimulus phrase in which the duration of the pre-tonic has been altered. For each stimulus, the listeners, or judges, make one a forced-choice response in which they indicate the speaker's most likely region of origin. To avoid possible confounds, stimuli were created by utilizing speech produced in comparable speaking styles and matched pairs that are synthesized, not elicited from the speakers.

At this point, it is relevant to mention that previous linguists also observe pitch curves in the vowel-lengthening of the Córdoba dialect. However, the role of pitch in the

Córdoba dialect is not well established; this may be partly due to the fact that much previous work with this dialect has been impressionistic and pitch is difficult to describe impressionistically, and since even more experimental work faces the lack of a systematic method for transcribing pitch contours. For instance, the Autosegmental-Metrical (AM) model (Pierrehumbert 1980; Ladd 2008) uses a systematized notation called Tone Breaks and Indices, or ToBI, (developed for English by Silverman et al. 1992) which forms guidelines for the transcription of prosodic and intonation features. ToBI has been adapted for many languages, including Spanish, with the SpToBI system being used to describe Spanish intonation contours (Prieto 2001; Beckman et al. 2002; Hualde 2003; Roseano 2010).

While the aforementioned researchers of Córdoba intonation all recognize the role of pitch in vowel lengthening, only Fontanella de Weinberg (1971) goes as far as describing the different pitch contours and how they align with the lengthened syllable. In that study, results showed that in the Spanish of Córdoba the pitch peak aligns with the pre-tonic syllable. However, more recent work by the author (Lang 2010) was unable to replicate this finding. In Lang (2010), the fundamental frequency (F0) of the pre-tonic vowel and tonic vowel segments were measured and their means were compared to determine their pitch differences, and it was found that the tonic vowel had a significantly higher mean pitch (F0) when compared to the pre-tonic pitch in a t-test in phrase-finally placed words of declarative utterances taken from naturally produced recordings ($p < .01$). This pattern instead is more similar to standard Spanish. A follow-up pilot study observed both pre-tonic vowel lengthening and the alignment of the peak in the tonic syllable (Lang-Rigal 2012). However, in both Lang (2010) and Lang-Rigal (2012) the design and number of stimuli made it difficult to draw firm conclusions about peak alignment. Since

acoustic analyses of Córdoba Spanish is limited and contradictory, the present experiment does not test pitch changes, intonation, or peak alignment, and instead focuses only vowel lengthening to begin isolating the most important cues in the identification of Córdoba Spanish. The acoustic analyses performed in the second experiment (chapter 5: Acoustic analysis of the *tonada cordobesa*) will provide an improved understanding of the role of intonation in the production of this dialect. The methodology for the Dialect Identification task tests the hypotheses described above with a perception test in which stimuli with both long and short pre-tonic vowel durations are categorized by speaker's region of origin. This study is the first to test the association of vowel length with Córdoba dialect identity.

Although all listeners in this experiment undergo the same treatment and hear the same stimuli, some variation is expected in listener responses. That is, an effect of the listener's background is hypothesized to occur, and so this experiment seeks to answer a second, and final, research question:

Research Question (2): *Which attributes of the listener influence accuracy in identifying speaker region?*

Two listener attributes are expected to be the most important in heightening sensitivity and thus increasing accuracy in identifying speakers based on their region of origin: the listener's region of origin and the listener's affiliation with the dialect group. Listeners from the same region as the speakers are hypothesized to be more accurate in identifying the speaker's region of origin; likewise, listeners who have experience or affiliation with the Córdoba dialect through friends or family from Córdoba or having visited the region

are expected to be more accurate. Previous research has found evidence for improved performance on tasks identifying listeners' region of origin for listeners with significant linguistic experience with or exposure to the dialect of the stimulus (Peters et al. 2002; Clopper and Pisoni 2004, *inter alia*). These listener attributes will be considered in the analyses that follow.

4.2 METHODOLOGY

4.2.1 Stimuli

Speakers

Speakers were recruited from three target regions: Córdoba, Buenos Aires, and Tucumán (representing Central, Littoral, and Northwest dialects, respectively). Speakers included both males and females, and varied from age 18-63, although the range of speakers recorded in Córdoba (n=12) was greater than in Buenos Aires (n=4) or Tucumán (n=4) (Table 4.1). All stimuli were collected in spontaneous, naturalistic conversations between the speaker and the author in 2009 and 2010. Speaker characteristics and the nature of the speaker-author interaction are described for each region in turn.

All Córdoba speakers included in this study shared the following characteristics: had lived their entire lives in Córdoba Capital, had parents who were both from the province of Córdoba, had not spent more than 3 months outside of Córdoba, and were not fluent in any language other than Spanish. The recordings of Córdoba speakers were collected during a sociolinguistic interview conducted by the author requiring that the subjects perform multiple speaking tasks. This study utilizes only the initial part of the interview in which speakers responded to questions about their background information in an oral questionnaire. Participants discussed their work, study, travel, and language

experience in response to open-ended questions orally presented by the interviewer. For the present study, these speakers are grouped by their regional origin and sex; those from Córdoba are additionally grouped by age, and each age/sex grouping is balanced by the speaker's estimated social class, either upper middle class or working middle class (Table 4.1).

<i>Speaker origin</i>	<i>sex</i>	
	<i>Male</i>	<i>Female</i>
CORDOBA		
Younger (19-32)	2	2
Middle-aged(33-47)	2	2
Older(48-64)	2	2
<i>(Total CO)</i>		12
BUENOS AIRES	2	2
TUCUMAN	2	2
<i>(Total BA, TU)</i>		8
Total all speakers		20

Table 4.1 Speaker groups for Dialect Identification test

The speaker age categories—young (18-32), middle-aged (33-47), and older (48+)—is relative to the year in which the recording was made, 2010.⁸ The estimated social class of each Córdoba speaker is based on three social measures: highest attained educational level, current and previous jobs, and current and previous neighborhoods of residence. Since this measure is difficult to quantify in a precise and divisible measure, and no speaker appeared to be either destitute or extremely rich, speakers were considered to belong to one of two groups within the middle class: upper middle or

⁸ The division of speakers into three age groups is as follows: speakers born during or after the late 1970s dictatorship (ages 19-32) were categorized as young; middle-aged includes those speakers who were born between the early 1960s and the dictatorship (ages 33-47); and older speakers were those speakers whose education and experience included both social movements (ages 48+).

working middle class. This division avoided the creation of more designations than these measures could accurately yield, while still providing the opportunity to examine the role of socio-economic class with respect to vowel lengthening and pitch.

To match the naturalistic, unelicited, spontaneous speech speaking style of the Córdoba tokens, the recordings from Buenos Aires and Tucumán are also all spontaneous and naturally produced. Unlike the Córdoba interviews, the Buenos Aires and Tucumán interviews involved a role play where the interviewer described a scenario and assigned a role to the participant, asking them to react naturally in the imagined interactions. For example, the researcher's oral elicitation *Estás en tu casa con tu hija, María, que está mirando tele. Decile que salís un momento a comprar*, "You are in your house with your daughter, María, who is watching TV. Tell her that you are leaving for a minute to buy something" generally elicited an oral response approximating *María, salgo un momento a comprar* "María, I'm going out for a minute to buy something". This role-play interview was designed by Prieto (2001) to elicit a variety of naturally produced intonation curves, and was adapted from Catalan to different dialects of Spanish including Rio Plate Spanish (see Gabriel et al. 2010).

Token selection

Multiple criteria were employed in the selection of tokens from the speaker interviews for the Dialect Identification perception task. The first criterion for token selection was the origin of the speakers, as described in the previous section. A representative sampling of age, social class, and gender was also included to ensure the authenticity of tokens and avoid a potential pitfall of the Matched-Guise Technique (Garrett 2003).

The second criterion for token selection was content, which had to be neutral to avoid the inclusion of any personally or locally identifying information. This step excluded a large part of the Córdoba recordings as they primarily consisted of speakers describing their life, their job, neighborhood, education level, etc. The third criterion was the exclusion of content or phonetic information that could be considered dialectal. This included the use of *trabajo* instead of the more frequent Rio Plate *laburo* for “work” and the augmentative suffix *-azo*; also, deviations from typical Spanish class vocabulary—a measure of a standard or neutral variety – were excluded since they could be considered slang. The phonemes corresponding to *rr* (/r/, which may be assibilated in Córdoba) and *ll* and *y* (all forms of the alveopalatal fricative /ʝ/) were not included in any part of the stimuli, since the pronunciation of these is known to vary between Córdoba and other dialects (Colantoni 2005, 2006; Lang-Rigal 2012).

Next, stimuli had to include at least one multisyllabic word that is not stressed on the first syllable for the sake of measuring and testing pre-tonic vowel lengthening. For instance in the phrase *fuimos a una casa bonita* “we went to a pretty house” only the word *bonita* /bo.'ni.ta/), is both multisyllabic and not stressed on the first syllable (unlike *casa* /'ka.sa/ and *fuimos* /'fwi.mos/); thus *bonita* would be the only potential target word within this token. This requirement ensured that the pre-tonic vowel lengthening phenomenon would have a prosodic place in the stimuli. It is important to note here that while most tokens contain only one word that qualifies for pre-tonic vowel lengthening (i.e., is multisyllabic without initial stress), some tokens containing more than one of these word types were retained in the stimuli to test the potential influence of the non-manipulated word on listener perception; thus, since only one of the two words is

manipulated, the strength of this single change will be revealed in the context of a potentially competing item within the same stimulus.

For the fourth criterion, total syllable length was considered in order to control for the amount of linguistic information available to the listener. For each token, the total number of syllables ranged from four to nine syllables. Too much information allows listener to use other linguistic cues (besides vowel-duration) to determine the speaker's origin, and an auditory stimulus that is too short risks not providing enough information for the listener to make a reliable decision. For the perception of a rhythmic feature, such as vowel duration in pre-tonic position, the minimum information necessary for the perception of this phenomenon is the syllables surrounding this multisyllabic segment, which must contain minimally the word in which lengthening occurs.

The fifth criterion in stimuli selection considered the number of syllables in the token. This had to be somewhat flexible to allow for variation in intonation type. Previous studies have shown that pre-tonic vowel lengthening occurs most frequently in phrase final position, so this consideration stipulates that the minimum stimuli length must be a multisyllabic word; however, despite Yorio's (1973) and Fontanella de Weinberg's (1971) conclusions that this lengthening only occurs at the end of an intonational phrase, the current study includes tokens in which the target word occurs in phrase final, utterance final, and phrase medial positions. This is to test the possibility that pre-tonic lengthening can be perceived medially within an intonational phrase or utterance. For short excerpts, the token itself is either part of an intonational phrase, a complete intonational phrase, or an utterance (albeit a very short one). The token may occur at the beginning, middle, or end of the intonational phrase and/or utterance; if it is the first two of these options, it is considered utterance medial, while the latter position is

referred to here as utterance final. All utterances are declarative and non-focused. Finally, the position of stress within the word is taken into consideration for each stimulus, to provide a balanced presentation of tonic and paroxytonic words.

For the Dialect Identification task in particular, the stimuli selection follows a few additional considerations. Since the initial token selection resulted in about twice as many tokens as were needed after applying the criteria mentioned above, further tokens were eliminated from the final selection based on the following limitations, listed here in their order of application. All tokens containing a diphthong or hiatus in pre-tonic or tonic position were eliminated since they would influence vowel duration. All possible combinations of monophthong vowels were permitted, however, despite the inherent duration differences for different vowel shapes. For example a word like *casita* /ka.'si.ta/ has /a/ in pre-tonic position and /i/ in tonic position; due to these inherent differences, the low, back vowel /a/ is inherently longer in duration than the front, high /i/. Using naturalistic speech and controlling for all other criteria made this necessary, and it is not expected that such durational differences will significantly influence the decisions and measures recorded in the current experiments.

Next, the word class of the target word in the token was considered so as to include a mix of nouns, (e.g. *casita*), as well as conjugated verbs, (e.g. *nací*) and infinitive verbs, (e.g. *pensar*), since lengthening occurs across word classes. The next criterion for elimination focused on the quality of the excerpts, which varied greatly since they consist of spontaneous speech recorded in differing naturalistic environments, including cafes, homes, and offices. This resulted in the elimination of potential excerpts in which the token word was produced with a word following it, thus necessitating the

sound file to be suddenly cut-off, or potentially causing the word to sound shortened, as well as sound files presenting distracting background noise.

The Dialect Identification tokens were selected with the goal of creating a balanced set of stimuli for each speaker group such that speaker and linguistic variation would be maximized and repetition in the task would be minimized. Forty tokens of naturalistic speech were selected: 24 tokens for the experimental (Córdoba) group, and 16 tokens from the control/distractor groups (Buenos Aires and Tucumán, see Table 4.3). This allowed for two tokens of speech per speaker, and the use of twelve speakers balanced across the social categories within the Córdoba stimuli (3 age groups X 2 social classes X 2 sex X 2 tokens = 24), and four speakers from each of the other two regions (4 speakers X 2 regions X 2 tokens = 16) (see Table 4.1 for speaker categories, and Table 4.2 for a list of each token).

Table 4.2 Natural stimuli for Dialect Identification experiment with speaker origin and target word.

Token#	SpeakerID	Speaker region	Target word	Complete token
id_01	YUM1	Córdoba	pensar	más se puede pensar,
id_03	YUM2	Córdoba	películas	películas,
id_05	YWM1	Córdoba	cocina	Así en la cocina.
id_07	YWM2	Córdoba	secundaria	en la secundaria...
id_09	YWF1	Córdoba	pasado	viernes pasado...
id_11	YWF2	Córdoba	semanas	un par de semanas...
id_13	YUF1	Córdoba	visitar	le fui a visitar.
id_15	YUF2	Córdoba	semanas	tres semanas, no más
id_17	AUF1	Córdoba	Argentina	dentro de la Argentina.
id_19	AUF2	Córdoba	traducir	pero no lo sé traducir...
id_21	AUM1	Córdoba	secundaria	en la secundaria.
id_23	AUM2	Córdoba	escuchar	Escuchar...tres.
id_25	AWF1	Córdoba	costó	me costó mas, eh,
id_27	AWF2	Córdoba	termina	vamos a ver cómo termina.

Table 4.2 (continued)

id_29	AWM1	Córdoba	aprenderlo	tenes que aprenderlo.
id_31	AWM2	Córdoba	películas	por las películas y
id_33	OWM1	Córdoba	humanos	Somos humanos.
id_35	OWM2	Córdoba	primero	O sea, el primero.
id_37	OUM1	Córdoba	escuchar	Escuchar, uno...
id_39	OUM2	Córdoba	Malvinas	volví de Malvinas...
id_41	OWF1	Córdoba	pasado	el anio pasado...
id_43	OWF2	Córdoba	tener	tenés que tener...
id_45	OUF1	Córdoba	neonatal	En el neonatal,
id_47	OUF2	Córdoba	poquito	siempre un poquito...
id_49	BAF1	Buenos Aires	peligroso	es peligroso.
id_51	BAF2	Buenos Aires	bicicleta	andando en bicicleta.
id_53	BAF3	Buenos Aires	problema	tanto problema.
id_55	BAF4	Buenos Aires	manera	Porque de cualquier manera
id_57	BAM1	Buenos Aires	empanadas	hoy comi empanadas.
id_59	BAM2	Buenos Aires	minutos	vuelvo en cinco minutos.
id_61	BAM3	Buenos Aires	hacer	que tengo cosas que hacer.
id_63	BAM4	Buenos Aires	sarcástico	un abuelo sarcástico.
id_65	TUF1	Tucumán	pregunta	parece otra pregunta.
id_67	TUF2	Tucumán	conozco	que no conozco.
id_69	TUF3	Tucumán	contenta	Está contenta,
id_71	TUF4	Tucumán	vecinos	Todos los vecinos,
id_73	TUM1	Tucumán	Marina	hoy vi a Marina...
id_75	TUM2	Tucumán	semana	fin de semana y,
id_77	TUM3	Tucumán	contando	Me estaba contando que
id_79	TUM4	Tucumán	seguro	No estoy muy seguro.

Token manipulation

Lastly, tokens were normalized in *Praat* (Boersma & Weenik 2010) since the recordings varied in quality. Some of the stimuli had come from recordings in which the speaker's voice was heard in only one channel (or in one earphone); in these cases, this channel was extracted in *Praat*, greatly reducing any background or machine noise in the

recording, so that the speaker's voice is heard without background noise. All recordings were converted to 44100 KHz and to stereo sound, so that stimuli would be heard in both earphone pieces. The intensity was found to be acceptable for all tokens, and all tokens were selected on the basis of being intelligible, which was tested on several Argentine pilot listeners before data collection began.

Tokens were saved in their original form, and a copy was made of each for duration manipulation in *Praat*. Manipulating spontaneous speech in *Praat* improves upon some traditional approaches. Having speakers naturally produce a matched pair can lead to more 'contrived' variants and other problems of authenticity and irregularity, such as Accent-authenticity or Mimicking-authenticity (Garret et al. 2003); this is avoided here by using computer manipulation. For manipulation of Córdoba (experimental) tokens, the original sound file was submitted to *Praat* "Manipulation" function to change the duration of the pre-tonic vowel of the target word within the token. In the manipulated file, the spectrogram does not appear and only the waveform can be seen, so the latter was used to determine the boundary between the pre-tonic vowel and the surrounding segments. The beginning of the pre-tonic vowel was marked at the zero-crossing of the first complex wave following the preceding consonant. Likewise, the offset of the pre-tonic vowel was marked at the zero-crossing of the first wave of the following consonant. This boundary was set at the first wave cycle that is greater than the one preceding it to mark the onset of the vowel, and at the end of the last wave cycle before it reduces in amplitude, for the vowel offset.

To make the duration manipulation, the onset and the offset of the pre-tonic vowel were marked with duration points, which set a moveable point for the manipulation. The duration between these points (the onset and offset) was noted, and entered into a

spreadsheet as the original, natural duration of the pre-tonic vowel. At this point, two more ‘duration points’ were added on the manipulation bar, immediately next to the onset/offset points, and within the duration of the vowel. These were the two points that were moved to change the duration of the vowel; the onset/offset points remain in place so that the duration of the rest of the stimuli remains 1, which is the duration proportion. To shorten the duration (for the Córdoba speaker tokens), the two inside points were pulled down to 0.50, which reduces the proportion of the duration of that segment by 50%, or half. The manipulated sound object is then resynthesized in *Praat* to create a new sound file, identical to the natural one but with the duration of the pre-tonic vowel reduced by 50% (Figures 4.1 and 4.2).

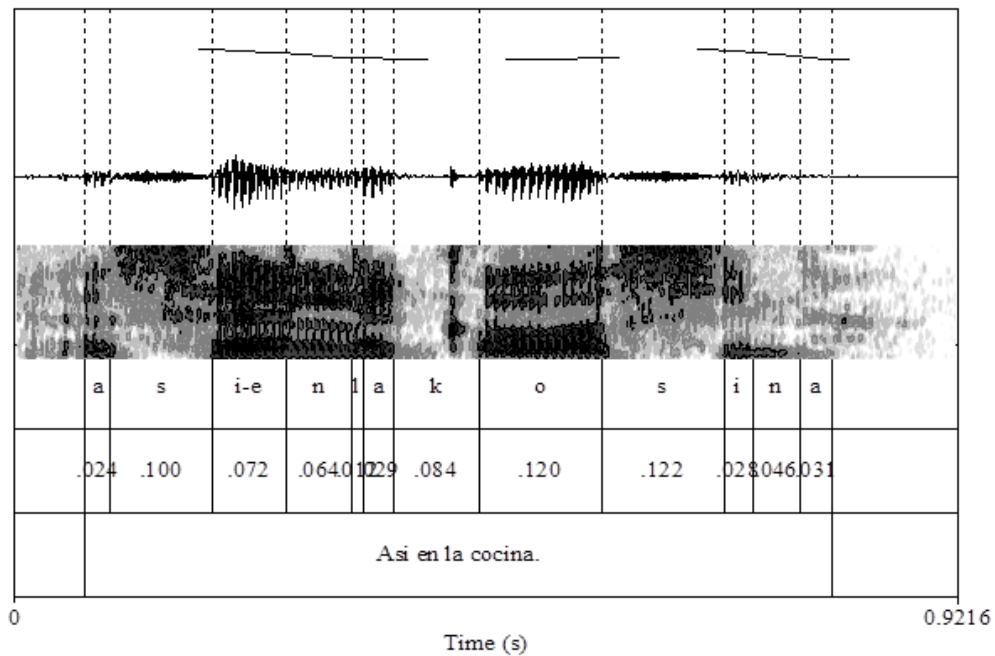


Figure 4.1 Original (natural) token for Córdoba speaker used in the Dialect Identification task: *Así en la cocina* “Like this in the kitchen.” Note the naturally produced pre-tonic /o/ in the target word *cocina*.

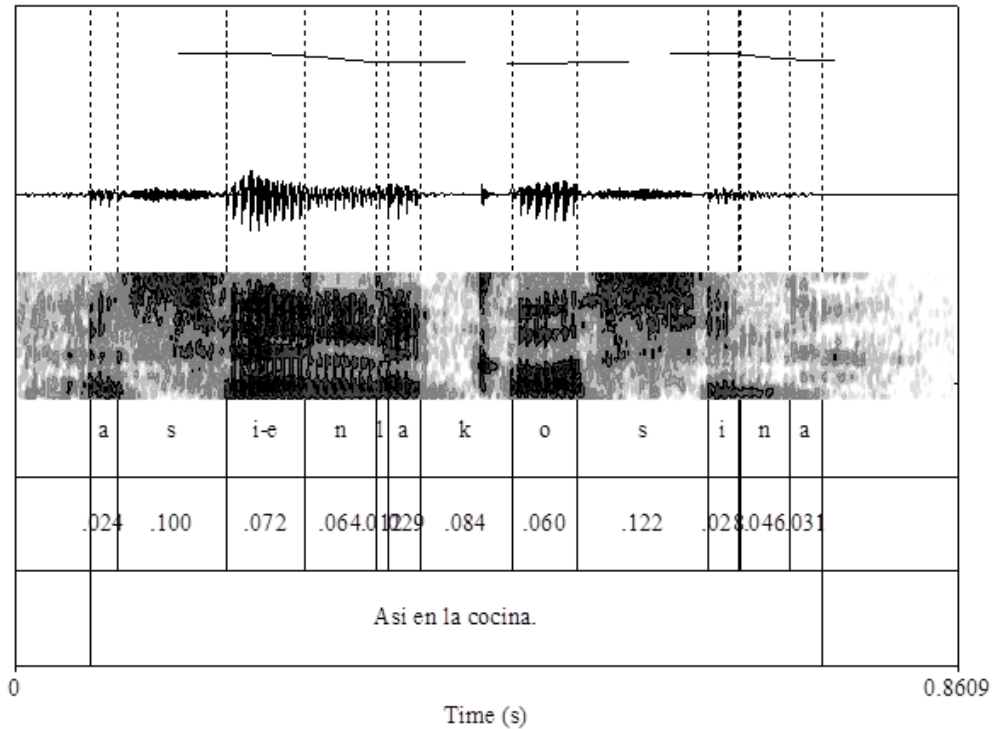


Figure 4.2 Manipulated token for Córdoba speaker used in the Dialect Identification task: *Así en la cocina* “Like this in the kitchen”. Note the shortened duration of pre-tonic /o/ of *cocina*.

The duration of the new file was then verified by hand by measuring the vowel in the waveform. The new duration was noted, and all manipulated Córdoba vowels were 50%, or half, of the original, within 5 milliseconds (ms).⁹

For the manipulation of Buenos Aires and Tucumán (control/distractor) tokens the files were submitted to the same procedure as the Córdoba stimuli, but instead of reducing the pre-tonic vowel duration by 50%, it was increased by 100%, or doubled in

⁹ This small variation is the result of two factors. In adding the two inside points there may be up to 3ms between each of the two points from the onset/offset points, and this duration would not be figured into the 50% manipulation. Also, the 50% manipulation is determined by dragging the cursor on the mouse pad, and so may be between 4.99ms and 5.01ms. These inconsistencies are due to the program and the operator and were unavoidable for this experiment.

duration. This was achieved by raising the two points on the duration line in the opposite direction as described above, from the baseline ratio of 1 to 2 in the *Praat* duration manipulation window. This procedure was more difficult to carry out, however, because certain sound files contained pre-tonic vowels that were either so short, or so reduced in vowel quality, that the waveform did not always have repeating or complex wave cycles during the duration of the vowel. This made finding the boundary between the pre-tonic vowel and surrounding consonants less clear. In these cases, the consonant was determined by a flat or striated waveform, and the vowel onset and offset were placed in between. The location of the consonant was confirmed auditorily, and similar to the procedure with the Córdoba tokens, the manipulated vowel was re-measured in the resulting sound file. If any imprecision hindered some of the tokens, the degree of difference is less than 10ms and thus too short to significantly influence perception; the minimal duration time for one syllable to be perceived as longer than the neighboring syllable is 30ms (for Buenos Aires Spanish; Toledo 1988, 2000a). The lack of effect of some of these manipulations due to this very reason will be further discussed in the results section of this chapter.

In sum, each stimulus consists of one intonational phrase (declarative neutral) and contains a target word, which is multisyllabic and not stress-initial. The target is either phrase-medial or phrase-final. All monophthong vowels were included in pre-tonic and tonic positions of the target word. Speakers from a variety of age, sex, and social class groups were purposely included, and potential tokens were excluded if they contained any feature that could be considered slang, that was particular to a specific Argentine dialect, or that made reference places or personal information. These naturalistic tokens were manipulated in *Praat* to create longer and shorter pre-tonic vowels for a matched-

guise perception test. The resulting tokens (n=80) represent three speaker origins (Córdoba, Tucumán, or Buenos Aires) and two pre-tonic vowel durations for each token (the natural duration and the manipulated duration (either shortened or lengthened), see Table 4.3).

Regional origin/token type	Natural	Manipulated
Córdoba	24	24
Buenos Aires	8	8
Tucumán	8	8
<i>Totals</i>	<i>40</i>	<i>40</i>
<i>Total tokens = 80</i>		

Table 4.3 Token type by speaker region (n=3) and treatment (natural vs. manipulated)

4.2.2 Procedure

Recruitment

The subjects for this experiment were voluntary participants in an online survey that was distributed through the author’s social networks using a “snowball method” to reach Argentine listeners. Recruitment of subjects was accomplished entirely online, by use of a descriptive message and URL link which directly connected the internet user to the website hosting the survey; the message was sent in personal emails, posted to the researcher’s Facebook community, and shared in a University-wide listserv; the messages for each of these types of communication can be viewed in Appendix A. Furthermore, the recruitment allowed and encouraged potential and actual participants to share these messages, or create their own, and to copy and paste the link to the survey so it could be

made available to their own social networks, with the intention of reaching the greatest number of Argentine adults as possible within an 8 week timeline (September-October, 2013).

While no one was prohibited from taking the survey, the two target subject groups of primary consideration in this analysis were speakers originating from Córdoba (province) and speakers originating from Buenos Aires (province). In order to participate, subjects had to be adults (18 or older) and native speakers of Argentine Spanish. They had to have headphones and access to the internet on a computer, and they were asked to take the survey in a quiet, low-distraction environment. Those speakers who are indeed Argentine, but claim one of the many other provinces as their place of residence and/or identity, were included in many of the analyses, but not when specific listener groups (i.e. Córdoba listeners) are mentioned. More specific characteristics of the subjects are included in the description of the written questionnaire.

Completion of Dialect Identification task

The online survey is accessed at the URL lablinguistica.com, which was created for the purpose of this study. All written and spoken speech in the survey and the consent form are presented in the subject's native language, Spanish. The survey was composed of three sections, two perception tests and a demographic questionnaire. These sections follow an introduction page that described the research project and obtained subject consent by clicking "next" at the bottom of the page (see Appendix C for the English translation).

*1. Para participar en este estudio, debes ser adulto, hablante nativo del español de Argentina y tener una audición normal.
Si tenés problemas de audición, es posible que encuentres este cuestionario demasiado difícil ya que requiere escuchar grabaciones de hablantes argentinos.*

2. *Para poder participar, vas a necesitar el uso de una computadora con conexión a internet y audífonos. También, debés asegurar que tu entorno sea lo más callado y tranquilo posible, porque vas a tener que escuchar con mucha atención y concentración; sin embargo no tiene respuestas ni “correctas” ni “incorrectas”, todo depende de tu opinión.*

3. *Te llevará entre 20 a 40 minutos completar el cuestionario, pero podés pararlo para descansar en cualquier momento. Si necesitás tomar una pausa más larga, tenés la opción de guardar tus respuestas y terminarlo en otro momento. En este caso, se te mandará por email un enlace con tu cuestionario incompleto. Solo intenta completarlo todo en el mismo día.*

The rest of the instructions and information from the original information and consent page in Spanish, and the English translations, can be found in Appendices B and C, respectively. After reading the instructions and clicking to consent to the study, the subjects began the Dialect Identification test described in this chapter. Both the manipulated and the natural tokens were presented (n=80, 4-9 syllables each token) in a pseudo-randomized order that was regenerated for each participant. This order was not entirely random because it did not permit a stimuli pair (i.e. the natural and the manipulated versions of the same recording) to occur sequentially. A minimum of 4 tokens were required between matched pairs to prevent listeners from easily mapping the two recordings to the same speaker.

Participants responded to the prompt *¿De qué region viene?* “Which region does [he/she] come from?” and were forced to select one of the three different dialect regions from which the speakers originated (Córdoba, Buenos Aires, or Tucumán); see Illustration 4.1.



Illustration 4.1 Screen shot from the online survey: Dialect Identification task answer form.

The selection of region is scaled to three points of certainty, so the listener determined if the speaker was *definitivamente* “definitely,” *probablemente* “probably”, or *tal vez* “perhaps” from the dialect region selected. These three choices of certainty were visually ordered, with the most certain (*definitivamente*) closest to the name of the region. The three region names formed triangular points, and the least certain option (*tal vez*) is closest to the center of the triangle for all three regions.

Listeners could play the token more than once in the case that they did not hear the token well the first time, but were encouraged to answer quickly and after one listen if possible. Participants were allowed as much time as they needed to complete all sections, but they were forced to submit an answer for each question before advancing to the next question. Listeners could not go back to a previous page and/or change their answers once they had advanced to the next page and next stimulus. This was true for the entirety

of the survey to ensure no questions were skipped or changed. The estimated time to complete the Dialect Identification test was 10 minutes.

Questionnaire

The perception test was accompanied by a written questionnaire investigating the language experience of each listener, and it included the subject's regional affiliation and that of their family, friends, and co-workers; the subject's history of travel within and outside of Argentina, and in particular to Córdoba; their knowledge of and experience with Spanish dialects and other languages; and their beliefs towards language use and variation. The stimuli for the questionnaire consist of written questions presented on a computer with multiple choice options for responses. The original Spanish version and an English translation may be found in Appendices D and E, respectively.

Questionnaire items were divided into three sections by topic. The first section, titled *General* ("General"), asked the participant's sex, education level, and current occupation. If the subject affirmed that he or she was a student, the questionnaire automatically asked for the professions of the participant's parents. The second section, *Lugares* "Places" was concerned with the participant's origins. It asked the participant to provide the city and province of both where he or she then resided, and where he or she subject grew up, if it is different from where he or she was currently living. Additionally it asked the participant where (city and province) he or she considered him or herself to be from, specifically by asking *Si alguien de otra provincia de Argentina te preguntara de dónde sos, que le dirías?* "If someone from another province of Argentina were to ask

you where you are from, what would you tell them?” The questions from the *Lugares* section appeared in the online survey as they are posed below (see Appendix E, “Places” for the English translation of this segment).

B. LUGARES

1. *Dónde vivís actualmente? (ciudad)_____ (provincia)_____*
2. *Te criaste aquí (en donde vivís actualmente)? Sí No*
- (Si la respuesta es ‘no’), dónde te criaste? (ciudad, provincia) Si has vivido en más de una ciudad, escribí el lugar más importante para vos (con el cual te sentís más identificado)
(ciudad)_____ (provincia)_____
3. *Si alguien de otra provincia de Argentina te preguntara de dónde sos, que le dirías?*
(ciudad)_____ (provincia)_____
4. *De dónde es tu madre? (ciudad)_____ (provincia)_____*
y tu padre? (ciudad)_____ (provincia)_____
5. *Tenés familia que vive en Córdoba (provincia o ciudad)? Sí No*
6. *Tenés amigos que viven en Córdoba (provincia o ciudad)? Sí No*
7. *Has visitado alguna vez la provincia de Córdoba? Sí No*
- (Si la respuesta es ‘sí’) Cuántas veces? 1-5 5-10 10+
8. *Has viajado a otros países de habla hispana? Sí No*
- (Si la respuesta es ‘sí’) Te quedaste más de un mes? Sí No

The fourth question pertaining to *Lugares* requested the participant to list where his or her mother and father were from. The responses for each of these questions required both the city and province to be provided, allowing for an open response for city and a drop-down list for province. Because of the possibility that non-Argentines are able to complete this survey, and for the Argentines to enter foreign current or past places of residence, the option *otro país* “other country” was included in the drop-down list in addition to the provinces of Argentina, and the possibility to write any city helped participants give honest and accurate answers.

In brief, these questions were used to determine the participant’s regional affiliation. This section also asked the participant if they had traveled to Córdoba, and if

yes, how many times and did they have friends or family there. It also asked if the participant had traveled to any other Spanish-speaking country. The questions pertaining to Córdoba were aimed towards the non-Cordoban participants, to evaluate the potential effect of having personal ties to and/or experience traveling within Córdoba. This was important to more accurately distinguish among non-Cordoban listeners and the possibility that their language attitudes towards Cordobans were positively influenced by familial or other ties to the region (see, for example, Peters et al. 2002; Clopper and Pisoni 2004, *inter alia*).

The third and final section, *Idioma* (“Language”), consisted of eight questions about the participant’s views on language. Specifically it asked if the participant was good at distinguishing between different dialects of Spanish, and if they are usually able to tell which province an Argentine is from by their accent. Lastly the questionnaire asked if the participant believed he or she has a nice sounding accent and if he or she believed the accent they have is favorably viewed by other Argentines. The purpose of these questions was to gather direct measures of language attitudes with regard to the speaker’s own regional variety, and their meta-linguistic awareness of dialect stereotypes.

These questions were presented in the sequence described above, in 4.2.2, after the participant had completed the two perception tests. The order of the tasks was fixed, and participants were not able to leave any fields empty in this, or any task. Upon completing the written questionnaire, participants reached the final page of the online survey. On this page they received their overall accuracy score (as a percentage) from the dialect identification questions, and they were also given an opportunity to write a question or comment here. This page also included the researcher’s name and email

address in addition to the comment box. Lastly, a written message thanked them for their participation and asked them to please share the survey freely with others.

4.2.3 Subjects

Over 100 people consented to and began the online survey. Only subjects who completed all three tasks (the Dialect Identification task and the written questionnaire) and who claimed Argentina as their country of “identity” in the questionnaire were included in the analysis; this yielded 63 adults of Argentine origin with normal hearing were included in the final analysis (Table 4.2).

Of these sixty-three subjects, twenty-one are from the province of Buenos Aires, fourteen are from Córdoba, nine are from Tucumán, eight are from Santa Fe, and the other eleven are from a variety of provinces that were not consistent enough to make any other groupings based on province. These provinces include: Jujuy, Misiones, Rio Negro, Santa Cruz, Santiago del Estero, and Neuquen. This results in five listener groups: Córdoba, Buenos Aires, Tucumán, Santa Fe, and Other.

Twenty-one of these subjects were male and forty-two female. The ages of the subjects ranged from 18 to 66, with the majority in the 26-40 age group. The education level of these subjects is skewed towards higher levels, with 54 (of 63) subjects having completed at least some university-level education. The professions of the subjects match this education level, with the majority of participants selecting professional employment (n=43) and the second largest group being current students (n=19). The third-highest number of participants in this study was in the homemaker category. Other, less common selections included state employee, managerial, skilled, unskilled laborer, retired, and unemployed.

Region of origin/identity		Job (self or parent)	
Buenos Aires,Capital Federal	21	unskilled laborer	0
Córdoba	14	skilled laborer	0
Tucumán	9	state employee	1
Santa Fe	8	managerial	1
Jujuy	4	professional	43
Misiones	2	unemployed	3
Rio Negro	2	student	19
Santa Cruz	1		
Age		Education level	
18-25	5	primary	0
26-40	42	secondary	5
41-55	14	tertiary	4
56+	2	university (incomplete)	16
Sex		university (complete)	18
Male	21	postgraduate	20
Female	42		

Table 4.2 Listener (n=63) features based on questionnaire responses.

4.2.4 Analysis

The analysis of the Dialect Identification test is fairly straight-forward, as there is a single question repeated across all stimuli—“Where do you think this speaker is from?” (see Illustration 4.1, section 4.2.2). The naturalistic stimuli have known correct answers, since the origin of the speakers is confirmed; however the manipulated stimuli present unnatural speech and require special consideration. The hypothesis of this study proposes that longer pre-tonic vowel durations are associated with a Cordoban accent and shorter durations with a Buenos Aires or Tucumán accent. Thus, the stimuli with a lengthened pre-tonic vowel duration are expected to induce the perception of an accent closer to that of Córdoba than any other choice, and those stimuli with a shortened pre-tonic vowel are

expected to disprefer the perception of a Córdoba accent, regardless of the speaker. This leaves the other two options, Buenos Aires and Tucumán, as viable choices for shortened-stimuli. In sum, the response for a given listener, or listener group, is compared against these standards for the three different token types: natural, manipulated long, and manipulated short.

The responses include a two-way measure: 1) region and 2) certainty. The measure of certainty is not reported in the following analyses. The primary reason for recording certainty was mainly psychological, aimed at providing the subject a means of expressing doubt and general insecurity about his or her answer in a forced-choice task. These responses were recoded as either 1 or 0 to be tested with a two-way repeated-measures ANOVA, where 1=an accurate response (i.e., the response region matches actual speaker origin) and 0=incorrect response (i.e., the region does not match speaker's actual origin). Thus, the accuracy is expected to be higher for all speakers in the natural samples and lower in the manipulated samples.

The averages for each listener were then grouped according to his or her region of origin and identity. First, a procedure for determining listener regional affiliation was used to create listener groups. Since origin is not so easily defined, the questionnaire used three separate questions to gain information about the participant's residence and regional affiliation. Instead of asking for the participant to list all places he or she has lived and/or to give a chronological account of previous residences, which become tiresome questions to complete if one has moved many times, the questions attempted to get directly at the participant's self-identity with respect to their place of origin, since this is what the study is more concerned with. Thus, to categorize the listeners for the Dialect Identification analysis, subjects were grouped by the province they provided for the question "If you

were asked where you are from, by another Argentine, what would you tell him or her?” This question is formulated to limit the participant’s response to one city and province, since people that have moved during their lifetime may have a more elaborate response, such as, “I grew up in X but am now living in Y, although my family is originally from Z.” The responses to this question were checked against the other origin questions “Where are you from?” and “Did you grow up there? If not, where did you grow up?” If the participant responded that he or she did not grow up in the same place they were then living in, then the response to the second part, “Where did you grow up?” was checked against the identity question described previously. For 61 of the 63 participants the answers to these two questions (“Where did you grow up?” and “Where would you say you are from?”) did not vary. This was considered to be a strong enough rate of coincidence, and so for all purposes the two questions are treated as synonymous for the participants.

For each listener, average accuracy was calculated for each of the six token types, which include three regions and two token types (natural vs manipulated). In addition to accuracy, the binary-coded data allowed for the calculation of mismatched responses. This count focuses on responses to the manipulated stimuli only, since these prompted the most misidentifications. For each of the manipulated tokens (n=40) the responses were counted and grouped by origin, not counting the accurate responses since the purpose is to determine for which region a given speaker was misidentified. For instance, for each manipulated token originating from a Córdoba speaker, the number of Buenos Aires identifications and Tucumán identifications (i.e., misidentifications) was counted and averaged for each of the three listener groups and for all listeners.

To investigate the influence of certain listener attributes on dialect identification, the same two-way repeated-measures ANOVA tests were re-run, with the listeners organized into different groupings. For this analysis, instead of basing listener classification on their self-report of origin and identity, listeners were grouped according to their affinity with Córdoba speakers. An affinity score was calculated by adding up their “yes” responses to three questions on the questionnaire regarding their experience with this dialect. Those questions were: (1) Do you have family in Córdoba?; (2) Do you have friends in Córdoba?; and (3) Have you ever visited Córdoba? If the participant answered “yes” to all three questions, he or she received a high score of affinity, two “yes” answers receives a medium score of affinity, and one or zero receives a low score.

4.3 RESULTS AND DISCUSSION

4.3.1 Speaker dialect accuracy

The analysis of Dialect Identification considers the responses to each stimulus as either correct or incorrect and response averages are grouped based on the stimuli characteristics of token type (2) and speaker regions (3) for a total of six stimuli groups, which are calculated for each subject ($n=63$). Each of the main effects (token type=2, speaker region=3) and the interaction of the main effects was found to be significant in the two-way repeated-measures ANOVA (Figure 4.4).

When all speaker regions are considered, the natural tokens resulted in significantly higher accuracy (59%) relative to the manipulated tokens (35% accuracy; ($F(1,62) = 223.7, p<.01$). When the two token types are considered together, speaker region (Córdoba, Buenos Aires, Tucumán) proved to be significantly different ($F(2,62) = 76.4, p<.01$). The interaction of token type and speaker region is also significant

($F(2,62)=19.7, p<.01$). The average accuracy for the Córdoba speaker stimuli is 57.3% for the natural (unchanged) tokens, and 27.9% for the manipulated tokens with a shortened pre-tonic vowel. The accuracy was highest in responses to the Buenos Aires speaker stimuli, averaging 80.6% correct identification across all listeners; this is significantly different from the identification of the manipulated tokens from the same speakers, in which an average accuracy of 51.8% was attained. For the Tucumán stimuli, the averages for both natural and manipulated tokens were low when all listener groups were combined: 39.3% accuracy for the natural tokens and 29.6% for manipulated tokens. Mean accuracy for each dialect group for natural and manipulated tokens is shown in Figure 4.4. Post-hoc (LSD) tests found significant differences between all regions for natural tokens and significant differences between Córdoba and Buenos Aires speakers ($p<.01$), and Buenos Aires and Tucumán speakers for manipulated tokens ($p<.01$).

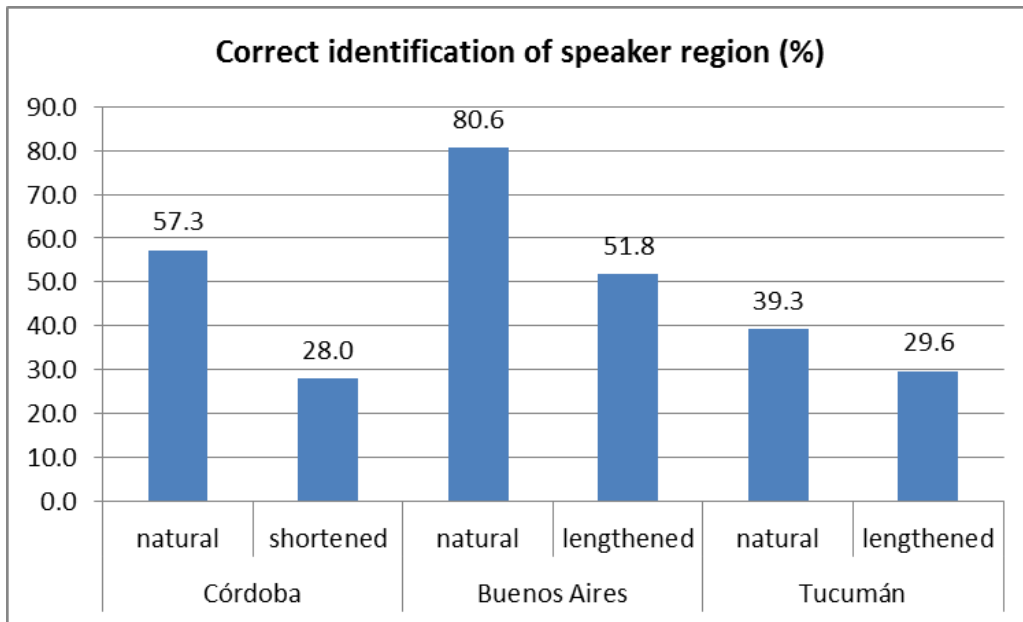


Figure 4.4 Accuracy averages for all listeners based on speaker origin and token type.

4.3.2 Pre-tonic vowel length and Córdoba-ness

The most important implication of the Dialect Identification results is in the difference in accuracy for natural and manipulated speech tokens. Recall that the manipulated tokens differed from the natural tokens in only one respect – the vowel duration of the pre-tonic vowel of the target word. The results for the stimuli from Córdoba speakers demonstrate that reducing the pre-tonic vowel duration by half significantly influences the accuracy for identifying that speaker’s province of origin, since the shortened (manipulated) versions of the Córdoba tokens resulted in a very low accuracy rate (<40%), with the majority of the responses to these tokens (>60%) nearly equally divided between the two other options, Buenos Aires and Tucumán. This finding very strongly suggests that longer pre-tonic vowel duration is associated with speakers from Córdoba and is supported by the finding that the shortening of pre-tonic vowel

duration reduces dialect identification to below chance (50%) accuracy. The results for dialect identification accuracy of the stimuli from the other speaker groups show the same effect to be true. The lengthening of pre-tonic vowel duration in the manipulated versions of tokens for the Buenos Aires and Tucumán speakers also hindered accurate dialect identification. Nearly half of the manipulated Buenos Aires speaker stimuli were misidentified, and of those most (68%) were believed to be from Córdoba. The results for the lengthened Tucumán tokens are even more notable: these were misidentified at the highest rate and received the highest proportion of Córdoba responses, composing 60.2% of the total responses, or 87.5% of the misidentified responses.

These results suggest that pre-tonic vowel duration serves as a cue for identifying a speaker as being from Córdoba, even when the pitch and other segmental and linguistic features are unchanged. There are always doubts when comparing the perception of natural speech to (computer) manipulated speech, as is done in this experiment. However, this is not considered to be a problem here since the duration manipulation does not disturb other segmental features or result in unnatural sounding speech. Moreover, in the piloting of this experiment, listeners were unable to identify which stimuli were manipulated and which were not. In fact, at no point in time did any participants show awareness that any of the stimuli had undergone manipulation, although many commented that the task, in general, was difficult.

In speech perception it has been suggested that duration differences of less than 30ms make it difficult to distinguish neighboring syllables (Toledo 1988, 2000a). Those tokens with already short pre-tonic vowel durations were manipulated to create an also very short (<30ms) vowel duration and were not expected to result in any significant perceptual reaction, accounting for some of the low accuracy rates of identification across

tokens of all types. Similarly, an unusually long pre-tonic vowel duration when shortened still may be ‘long’ relative to the tonic vowel and so be perceived as Cordoban-sounding despite the manipulation. Having relied on naturally produced speech with a broad range of natural variation resulted in some tokens being more or less impacted by the manipulation, which, in turn, influenced their proportional significance within the syllables of the token. Thus, a very short pre-tonic duration when doubled may still have been short relative to the tonic vowel duration in the same word, leading to a decreased effect on the perception of pre-tonic lengthening that was intended for the manipulated stimuli. Consequently, when results for individual stimuli were considered, some displayed accuracy averages that do not follow the trend for the majority of the data, which is attributed to the inherent, natural differences between the stimuli. These particular stimuli are analyzed in detail in chapter 5 to determine the prosodic, intonational, or linguistic factors influencing their perception.

One of the Buenos Aires tokens was consistently misidentified in its natural version (i.e. listeners did not think this speaker was from Buenos Aires). Further analysis of this particular stimulus revealed that the duration of the pre-tonic vowel relative to the tonic vowel did not in fact reflect the duration proportion that is expected and usually found for all other stimuli from the Buenos Aires speakers: the pre-tonic vowel for this token is actually longer than the tonic vowel and has an almost equal (.906) proportion, which is to be expected for a Córdoba speaker (based on the results shown in this study and in Lang (2010)). This additional post-hoc observation supports the overall finding from this experiment that longer pre-tonic vowel duration, roughly as long as the tonic vowel and double that expected for standard varieties, is associated with a Córdoba origin.

4.3.3 Listeners grouped by origin

When listeners are divided by region of origin the accuracy of listener identification shows some significant differences between certain groupings, and very little difference between others. The grouping of listener origin is based on the province selected as the subject's place of origin and identify with origin on the questionnaire. This resulted in four groups with a minimum of eight listeners per group. The creation of a fifth group (Other) allows for the inclusion of Argentines originating from provinces not represented in these other four groups. These listeners are included in the analysis for "All listeners" and in this overall analysis as well to provide some insight into how a group with mixed origins performs. The averages in Figure 4.5 show listener groups arranged from least to most accurate response.

The effect of listener region on identification accuracy was tested with a series of ANOVAs that analyzed each token type separately and considered interactions between token type and listener group. In general, identification accuracy improves slightly when the listener group origin matches that of the speaker group. For natural Córdoba tokens, the mean accuracy was 57.5% and there were no significant differences for the listener regions, ($F(4,62)=1.277$). For the manipulated Córdoba tokens there was a main effect for listener region ($F(4,62)=4.523$, $p<.01$). The highest accuracy was for the Córdoba listeners (40%), followed by Other (27%), Buenos Aires (26%), Santa Fe (22%), and Tucumán (21%). A post-hoc (LSD) test showed significant differences in accuracy between Córdoba listeners and all groups except Other ($p<.01$, see Figure 4.5). The high accuracy of the Other group may be due to the fact that many of the individual speakers in this mixed group are from provinces neighboring Córdoba, and so are closer to the Córdoba listener group than any other listener group. This interpretation supports the

belief that listener experience with the speaker dialect, specifically living within in it, positively influences the identification of these speakers (Clopper & Pisoni 2004).

Now we move on to the responses to the Buenos Aires speakers. The natural Buenos Aires tokens received the highest accuracy averages for all listener groups (80%), with a significant main effect for listener region ($F(4,62) = 5.365, p = .001$). Buenos Aires listeners scored significantly more accurately (89.3%) than Córdoba (70%) and Tucumán (68%) listeners in a post-hoc LCD test ($p < .01$). Buenos Aires listeners outperformed listeners from Santa Fe (86%) and Other (83%) only in a one-tailed test ($p < .05$). For the manipulated Buenos Aires tokens (overall mean accuracy = 51.7%) there were no significant differences between any listener groups ($F(4,62) = 0.986$).

Lastly, the responses to the Tucumán speakers received the lowest accuracy averages for all groups (42%), excepting the Tucumán listeners. For the natural tokens, listener groups performed significantly differently from one another ($F(4,62) = 6.726, p < .01$). In a post-hoc (LSD) analysis, Tucumán listener accuracy (61.1%) is found to be significantly higher than all other listener groups (Other = 47%, Córdoba = 37%, Santa Fe = 36%, and Buenos Aires = 29%; $p < .01$). The second highest scoring group, Other (47%), scored significantly higher than Buenos Aires listeners (29%, $p < .01$). The manipulated Tucumán tokens were difficult for all other listener groups (mean = 30.3%), with no significant differences between them ($F(4,62) = .209$).

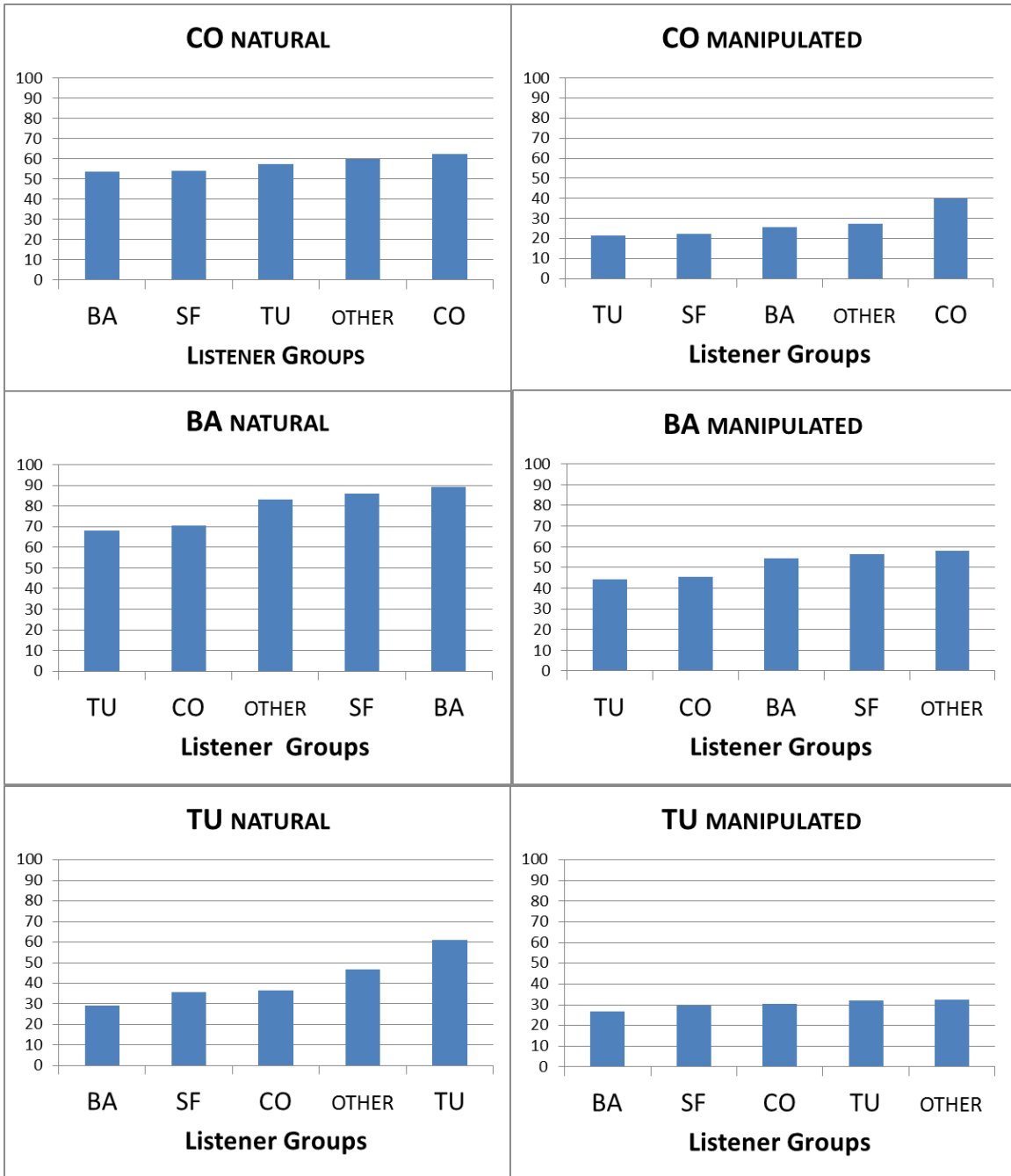


Figure 4.5 Listener groups (n=5) are ordered from least to most accurate (% correct) for each token type, based on Speaker Region and vowel duration.

Presumably, the increased familiarity with the Tucumán dialect for the Tucumán listeners and those from the Other provinces (some of whom are from the same or a neighboring dialect zone) led to a significantly higher recognition of the Tucumán speakers in this test. Buenos Aires listeners, over 1000 miles away, would be less likely to have enough exposure to speakers of this dialect to be able to identify any linguistic markers of regional identity. Probably one of the more salient acoustic markers of the Northwest dialect is the assibilation of the /r/ (Fontanella de Weinberg & Donni de Mirandi 2000; Rojas 2000; Fernández Lávaque & del Valle Rodas 2003). This variant is produced as a trill in other varieties of Spanish including the Littoral zone of Argentina. The phonetic environments for its assibilated or trilled production are as a single consonant, *r*, in word-initial position, *rojo*, or doubled, *rr*, in intervocalic position, *perro*. Words containing *r* in these phonetic environments were purposely excluded from the stimuli used in this experiment to avoid introducing additional regionally-marked variation. However the use of the assibilated variant may be declining in Argentine varieties outside of Buenos Aires in favor of the trill, while assibilated palatals, or the alveopalatal fricative [ʒ] characteristic of Argentine Spanish and Buenos Aires Spanish in particular, have also been spreading in these same dialects (Donni de Mirande 2000; Colantoni 2005). Donni de Mirande (2000) cites the center of the capital cities of Tucumán and Córdoba as those zones where the assibilated palatal (or alveopalatal fricative) is penetrating the dialects outside of Buenos Aires, and this is precisely where the speakers recorded for these studies come from.

There is still reason to believe that the pronunciation of the alveopalatal fricative allows for socially meaningful variation. The primary evidence is from the research on the devoicing of this phoneme [ʒ]~[ʃ] in younger, female speakers in Buenos Aires (Wolf

and Jimenez 1977; Fontanella de Weinberg 1985; Chang 2008; Rohena-Madrado 2013). A pilot study by the author (Lang-Rigal 2012) suggests that the alveopalatal fricative, which was the preferred variant for younger speakers from Buenos Aires, Córdoba (capital), and San Miguel de Tucumán, showed dialectal and sex differences in the devoicing of this phoneme, which is likely to maintain some regional distinction. However, phonetic environments for *y ll* were purposely excluded from these stimuli to avoid providing this regional clue to listeners.

What other acoustic features made the Buenos Aires speakers more readily identifiable than the other groups? This variety is not the only one that has a known set of linguistic features that distinguish it from the other varieties in Argentina. For instance, the provincial varieties in the Northwest dialect zone are characterized by their aspiration of /s/, elision of word-final /r/, syncope of intervocalic /d/, in addition to syntactic and lexical tokens (Rojas 2000; Fernández Lávaque & del Valle Rodas 2003; Martorell de Laconi 2006). Furthermore, the Northwest dialect displays an intonation, or *cantito*, to use Rojas' words, that distinguishes between the provinces of Tucumán, Salta, and Jujuy, but also characterize these areas together (as a dialect zone) to differentiate this area from others, in particular Buenos Aires:

...Toda esta zona [el noroeste] tiene un “cantito” similar, acompañado del alargamiento de las vocales tónicas. Esta característica se acentúa más cuando menor es el nivel sociocultural del hablante, pero lamentablemente aún no ha podido estudiarse con detenimiento. (Rojas 2000:146)

‘...This whole zone [the northwest] has a similar “song”, accompanied by lengthening of the tonic vowels. This characteristic is accented more as the sociocultural level of the speaker is less, but sadly it hasn't yet received careful study.’ (my translation)

The results of this study show that listener experience as indicated by province of origin influences dialect identification such that accuracy increases when listeners identify the natural speech from speakers from their home province. This finding is unsurprising, as increased experience with specific speaker features has been shown to improve one's ability to identify novel speakers with these same features (c.f. Clopper & Pisoni 2004, *inter alia*). The influence of listener origin allowed Córdoba listeners to outperform other listener groups in correctly identifying speakers of Córdoba origin even for manipulated tokens, when the cue of pre-tonic vowel lengthening was “removed”. This suggests that other linguistic features are indeed present and associated to the Córdoba dialect; however, it appears that the only listeners privileged to this sound-meaning association are those of the same dialect zone – Córdoba.

4.3.4 Listeners grouped by experience

Analyses of variance were re-run using a different method for grouping listeners: they are organized according to their affinity to Córdoba speakers (based on having friends, family, and experience traveling to Córdoba) into three groups of low, medium, and high affinity. Using accuracy as a dependent measure, no main effects were found for the Affinity variable when analyzing the Córdoba speaker tokens – for both natural and manipulated versions. The Low Affinity group did show a lower accuracy average (53.7%) for the natural Córdoba tokens than the Medium Affinity (59.1%) and High Affinity (58.5%) groups; however, since these differences are not significant ($F(2,62) = .994$), we can make no conclusions about this listener feature.

While Clopper (2006), Peters et al. (2002), and other researchers have found that listener experience, apart from listener origin, may increase accuracy in identifying a speaker's regional dialect, this positive effect of listener experience was not found when

listeners in the present study were grouped by experience (i.e., associating with Córdoba speakers and province, described here as “Affinity”). It is likely that the present study fails to capture a true representation of “experience” in the questions it presents to listeners, or that simple associations to Córdoba speakers (i.e. having friends or family from Córdoba) does not directly affect the amount exposure to the dialect. Clopper and Pisoni’s 2004 study used the subject’s present and past places of residency to account for differences in dialect categorization. Perhaps residence should be viewed as similar to origin and identification, as the present study does, and be likened less with affiliation to speakers of a given dialect; nonetheless, other types of listener experience merit consideration in perception research.

4.3.5 Dialect misidentification

In these short excerpts of speech the experimental manipulation of either lengthening or shortening the pre-tonic vowel duration of the target word resulted in duration changes ranging from an 18ms to 100ms difference between the natural and manipulated pre-tonic vowel lengths, since natural durations ranged from 36ms to 190ms. For the manipulation, the natural duration was either doubled or halved, depending on the treatment/speaker group. In this section we consider the responses to the manipulated tokens only to assess the direction of the response. While manipulated tokens did not all result in a misidentified speaker the majority of these tokens were not accurately identified, the proportions of which vary depending on the original region of the speaker (Figure 4.6).

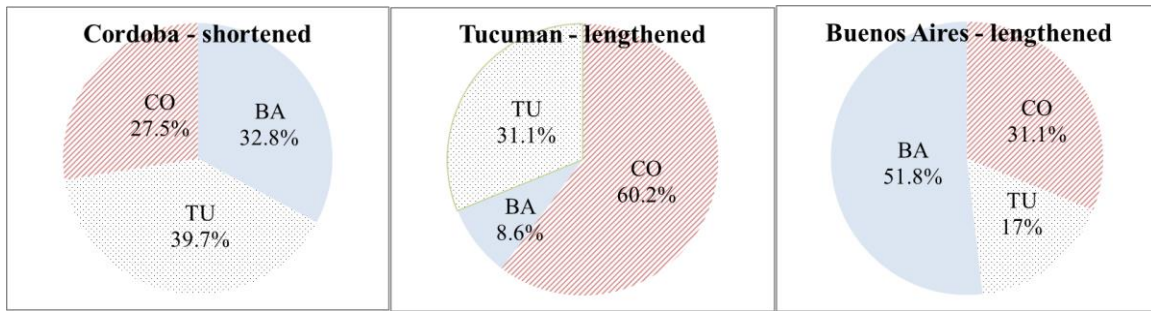


Figure 4.6 Proportions of Speaker Region identifications for manipulated tokens

For Córdoba speakers, a little over 70% of the manipulated tokens were misidentified, and these responses were fairly closely divided between the other two dialect regions, Buenos Aires (32.8%) or Tucumán (39.7%). The majority of the manipulated (lengthened) tokens from the Tucumán speakers were misidentified as Córdoba (60.2%), and only a small percent, 8.6%, of the lengthened Tucumán tokens were identified as from Buenos Aires. The manipulated (lengthened) tokens from Buenos Aires speakers received the lowest proportion of misidentification, at 48.2% total, the majority of these were perceived as Córdoba speakers (31.1% of the total tokens from this group).

4.3.6 Recognizability and identity

Another interesting topic raised by the results of this dialect identification task is that of dialect recognizability and speaker identity. Receiving the highest accuracy rates, Buenos Aires speakers are assumed to be the most recognizable of those speakers investigated here. This was the only group whose accuracy remained near 50% (chance identification) even when their speech was manipulated, with doubling of the pre-tonic vowel duration. Why these speakers are more recognizable than the others may be indicative of both linguistic and social factors, and the interaction of the two. For

instance, the intonation of Buenos Aires Spanish specifically (not extending to the other dialect zones of Argentina) has been described as having some salient contours (Kaisse 2001; Colantoni and Gurlekian 2004, *inter alia*). Although these stimuli present very short excerpts of speech (around 1 second) they still convey intonational information, which may make these speakers easier to recognize than the others. This assumption is complicated by the fact that the intonation for Córdoba and Tucumán (Northwest) dialects is not well described in the linguistic literature, and so if there are unique contours they have yet to be described by linguists.

However, increased exposure to the dialect does not account for the fact that Buenos Aires speakers are identified more accurately than matching listener-speaker groups. For example, Córdoba listeners identified Buenos Aires speakers at an accuracy of 70% and their fellow speakers from Córdoba at an accuracy of only 62%. The effect of exposure and familiarity is discounted by these figures, which consistently place Buenos Aires speakers at a higher rate of identification relative to all other token types across listener groups (see section 4.3.3 and Figure 4.5 above for detailed results). Instead, this recognizability is most likely indicative of a linguistic feature that marks Buenos Aires speakers more distinctly than Córdoba or Tucumán speakers. As previous research suggests, the intonation and prosody of Buenos Aires Spanish may be the source of this saliency, and these features merit further investigation into their perception.

An additional explanation for the greater recognition of Buenos Aires speakers is a social one. The Littoral dialect is simply more present throughout Argentina, in terms of the number of speakers and its diffusion through mass media. Increased recognizability confirms the dominance of this dialect over the others in Argentina, while the unrecognizability of the Tucumán speakers as revealed by this experiment shows the

opposite to be true. A lack of exposure to Tucumán speakers, who are relatively more isolated and fewer in number, is suggested by the fact that they are the only listeners who could accurately identify features of the Tucumán speakers in this experiment. The recognizability of a single dialect feature (like pre-tonic vowel duration) or a set of dialect features is bound to influence how listeners perceive their own, and others' identity. Speakers show that they are conscious of linguistic differences by pointing out and defining them, much as the website explaining the rules of the *tonada cordobesa* cited in chapter 1 has done for the pre-tonic vowel lengthening in this dialect. The explicit linking of form (e.g. *long vowel*) and meaning (e.g. *Córdoba speaker*) through these types of media can make both speakers and listeners more aware of this speech feature and the identity it signifies, thus helping them decide on dialect identification. The mapping of identity to these particular linguistic features could be said to depend upon the recognition of their form.

That Tucumán speakers were virtually unrecognizable even in the natural tokens of this experiment becomes even more interesting when we take into account how the Tucumán participants view their own dialect, as evidenced by their responses to the questionnaire. There, each participant was asked if they believed their own dialect to be perceived as *lindo* “nice” by other Argentines. The Tucumán group provided the most *no* responses to this question, versus only 10% and 16% from Córdoba and Buenos Aires subjects, respectively. In an ongoing language attitude study by the author, the aesthetic evaluations that Argentine listeners provided for anonymous speakers from Córdoba, Buenos Aires, and Tucumán also reflect a negative opinion of Tucumán speakers' accent when compared to the same evaluation made for Córdoba and Buenos Aires speakers. This was measured by the proportion of responses listener-judges made to the question

¿Cómo suena el acento [de esta persona]? “How does [this person’s] accent sound?” following a natural speech sample from speakers originating from these provinces. The Tucumán speaker stimuli used in this exploratory survey received a higher percentage of *feo* “ugly” evaluations (8.2%) compared to the 1.9% for Buenos Aires speakers. Accordingly, the accent rating *lindo* “nice” was significantly lower for speakers perceived to be from Tucumán (25.7%) than those speakers perceived as being from Buenos Aires (34.4%, Pearson chi-square = .003, df = 4, value = 15.8, in Lang-Rigal 2014).

These results for dialect recognition and attitude result in a regional variety (Buenos Aires) being highly salient and at the same time positively esteemed by Argentines of the same and other regions. Tucumán speakers, on the other hand, appear to have a more neutral-sounding dialect, in that they are not readily assigned to any one region in the dialect identification task, and yet they suffer in evaluations of aesthetic value. This would suggest that strongly marked linguistic variants versus neutrality do not coincide with other ideologies of a linguistic standard in Argentina. This is supported by research exploring the correlation between positive evaluations of social status and varieties perceived to be un-marked and more standard, while low social status and high solidarity (attractiveness and integrity traits) are assigned to dialects perceived to be non-standard, and thus resulting in a covert prestige (c.f. the language attitude studies by Labov et al. 1968; Giles 1971, 1973; Preston 1999a). Clearly, dialect identification has implications going far beyond accuracy. The acoustic measurements of the stimuli used in the Dialect Identification task will be discussed in the chapters to follow, and such analyses will contribute to answering the greater questions posed by this dissertation regarding the socially meaningful linguistic variance of this dialectal variation.

Chapter 5: Acoustic Analysis of *La tonada cordobesa*

5.1 INTRODUCTION

Previous research on the *tonada cordobesa* described a lengthened pre-tonic vowel and tonal features that accompany this lengthening (Malmberg 1950; Vidal de Battini 1964; Fontanella de Weinberg 1971; Yorio 1973). Fontanella de Weinberg (1971) provides the most in depth description of the acoustic features, categorizing the different intonation glides, peak heights, and boundary tones that anchor to the lengthened syllable when it is in pre-nuclear position. While Yorio's (1973) analysis confirms many of Fontanella de Weinberg's results, the acoustic properties of this variety remain to be confirmed with non-impressionistic measures. Lang's (2010) findings suggest that tonal movement and peaks are not confined to the lengthened pre-tonic syllable, but may be occurring later than Fontanella de Weinberg suggests, specifically, in the tonic syllable. The intonation of Córdoba Spanish has been described by linguists interested in this dialect and by the laypeople for whom these acoustic traits are meaningful, yet it remains to be investigated through quantifiable perception measures that address the saliency of the dialect, its linguistic features, and the social meaning these features subsume. This dissertation is the first study to undertake redressing these omissions as its objective.

The second component of this dissertation focuses on the acoustic features that characterize the audio stimuli used in the Dialect Identification task, the features of which have been shown to directly influence how listeners perceive these speakers. This approach is unique in that the tokens measured for production are directly connected to

the perception task, so the production results can be immediately analyzed in the context of perception, for instance, in analyzing specifically those tokens that were rated as salient in the identification of Córdoba identity.

In the remaining discussion of this section of chapter 5, the experiment's objectives are stated with research questions and hypotheses and are contextualized by relevant sources and observations. Next, section 5.2 details the methodology for measuring and analyzing the acoustic features of interest. The subsections cover the general characteristics of stimuli, duration and pitch measurements, the syllable timing analysis, the linguistic analysis, and the selection of perception tokens for acoustic analysis. As the focus of this chapter is to provide a variety of approaches for analyzing the acoustic features of the *tonada cordobesa*, the methods and analysis section is extensive. Lastly, the results from these analyses are detailed in section 5.3, which focuses specifically on pre-tonic vowel lengthening, peak alignment, syllable timing, and finally, individual speaker variation.

5.1.1 Research Questions

Four research questions motivate the acoustic analyses performed for the *tonada cordobesa*, with special attention to the influence of these features in the perception of Cordoban Spanish. The first objective of our acoustic analysis is to ascertain the incidence of pre-tonic vowel lengthening in the Córdoba speakers' productions:

Research Question (1): *How does vowel duration of the pre-tonic syllable (the one believed to be lengthened to produce the effect of the tonada) compare to the durations of the surrounding syllables (i.e., the pre-pre-tonic and the tonic syllables)?*

The pre-tonic durations of the Córdoba speakers are expected to be significantly longer than those of the Buenos Aires and Tucumán speakers. This is based on the evidence and observations of past linguistic studies, including that of the author, in which the pre-tonic syllable is lengthened (Lang 2010; Fontanella de Weinberg 1971; Yorio 1973; Malmberg 1950; Vidal de Battini 1964).

The question of the degree of lengthening of this syllable has been determined by Lang (2010) to be on average the same duration as the tonic syllable. This result was produced in a controlled comparison within nuclear positioned words with the same monosyllabic vowel in pre-tonic and tonic position across a variety of speakers producing spontaneous naturalistic speech. The lengthening of the pre-tonic syllable to reach that of the tonic syllable is viewed in this research as a significant deviation from the expected prosodic proportions in neutral utterances, considering that increased duration is a correlate of stress in Spanish, along with an increase in pitch and intensity (Hualde 2005). However, these durational effects may also affect the syllables adjacent to the stressed syllable. Of the syllable positions, the pre-tonic one is believed to be most susceptible to this spread of duration (Hualde & Chitoran 2003, in Hualde 2005:244). Thus, lengthening of the pre-tonic syllable is not rare for Spanish, but it is argued here that the extent to which it is lengthened in the *tonada cordobesa* is unusual. Additionally, this feature is expected to correlate with the listener's dialect identification and to show differences in the perception of individual tokens and/or speakers that are not evident in the grouped results reported in Chapter 4 for the Dialect Identification test. The acoustic features analyzed in this section are intended to contribute to this analysis by identifying differences in production and perception within a dialect group.

The role of vowel duration is discussed in previous chapters of this dissertation as co-occurring with a secondary prosodic feature of interest—pitch—and is addressed in the second research question:

Research Question (2): *Does pitch alignment play a part in the tonada? How does the pitch align relative to the tonic and pre-tonic syllables? Does this differ from Buenos Aires Spanish?*

Pitch alignment is not expected to play a role in the identification of the speaker's region of origin, as in this dissertation pitch is hypothesized to be secondary in importance to durational differences in the production and perception of the *tonada cordobesa*. This hypothesis does not directly contradict Fontanella de Weinberg (1971) and Yorio (1973); in fact these studies do not make any statements confirming the perception of the dialect, but only express beliefs about pitch being physically anchored to the *tonada*. I interpret this to mean that the pitch curve is anchored to the pre-tonic syllable (where the lengthening occurs), as opposed to the tonic syllable, as is typical for Spanish (Hualde 2005). It is predicted that the pitch will still be anchored to the tonic syllable and will reach its peak within it, and not within the lengthened pre-tonic syllable, as Fontanella de Weinberg suggests (1971). Instead, the pitch is expected to align with the tonic syllable, as was suggested in two previous studies by the author (Lang 2010; Lang-Rigal 2012).

Llisterri et al. (2005) found that the correlates most important for the perception of stress are pitch, duration, and intensity, but duration and intensity were not enough to result in the perception of stress without the cue of pitch accent. I believe this to be the case for the *tonada cordobesa*, justifying the shift of duration only to the pre-tonic

syllable, while pitch remains anchored to the stressed syllable, maintaining its essential property of stress.

However, the pitch contours analyzed in these tokens of speech are expected to reveal differences that render the *tonada cordobesa* different from pitch contours typical of Buenos Aires or Tucumán. For Buenos Aires speakers, the pre-nuclear peak of declarative neutral utterances usually shows early peak alignment, while the nuclear peak is aligned within the stressed syllable (Toledo 1989, 2000b; Sosa 1999; Colantoni and Gurlekian 2004; Colantoni 2011; Peskova et al. 2012). Kaisse (2001) in particular noted the “long fall” for Buenos Aires Spanish, which describes a particular tonal feature of dropping within the stressed syllable after reaching a relatively high peak, all within the same syllable (attested also in Colantoni 2011). The tokens used for both of the perception tests in this dissertation contain declarative, neutral utterances. Utterance types were controlled for, but differences are still expected to occur between speakers and speaker groups, primarily based on dialect.

The remaining two research questions probe several linguistic variables that could potentially correlate with the vowel lengthening phenomenon of the *tonada cordobesa*.

Research Question (3): *What other supra-segmental features, not already known to differ between Córdoba and Buenos Aires, may influence listener perception?*

One other supra-segmental feature is analyzed in this experiment: the phrasing of the syllables. The grouping of syllables and the measurement of their timing within the phrase may reveal further characteristics making this dialect so acoustically salient, and there may be a relationship between the grouping of syllables and the lengthened syllable

or tonic syllable. We expect to find a rhythmic pattern in the timing of syllables, accounting for the *cantito* of the *tonada cordobesa*.

Research Question (4): *Is pre-tonic vowel lengthening conditioned by syntactic, morphological, or other linguistic features of speech, evident in the utterances used in the perception test?*

While the data available for our acoustic analysis provide a limited set of tokens, linguistic features of the target word and token are considered for the possible existence of any pattern related to vowel lengthening. These include the syllable type, word type, position of stress in the word, position of the word in the intonational utterance, and the utterance type. Of these features, syllable type, word type, and the position of the stress in the word are not expected to have any effect on vowel lengthening. When combining the position of the word in the utterance and the utterance type, pre-tonic vowel lengthening is expected for words at the edge of internal and external boundaries, based on the observations of Fontanella de Weinberg (1971) and Yorio (1973). Unfortunately, this research design does not provide a large number or variety of intonational contours among the tokens, and so analysis of the intonational contour is unlikely to produce results affirming this pattern. Due to the limited number of tokens available for quantitative analyses, the objective is to provide a thorough description of the tokens so that the perception results may be better interpreted, and any patterns explaining pre-tonic vowel lengthening may be identified for further analysis. These results will add to the few foundational studies on the *tonada cordobesa* from which future research may draw.

5.2 METHODOLOGY

The methodology for the acoustical analysis fulfills the research objectives described in the Introduction, and as such, draws upon several approaches. The two principle steps take measurements of the acoustic features of interest for all tokens, and combine the perception results with the description of the acoustic features to determine if any explanatory patterns emerge. Here we will describe how measurements are taken and the process of selecting tokens for analysis with the acoustic results.

5.2.1 General characteristics of stimuli

The Dialect Identification task consists of 80 auditory stimuli, half of which are manipulated copies in which the pre-tonic vowel duration of the target word within a stimulus has been either lengthened or shortened depending on the speaker's region of origin (see Table 4.2 for a list of the 40 natural stimuli). The duration of each token ranges from 0.641 seconds (641 milliseconds) to 1.818 seconds (1,818 milliseconds) for the natural stimuli and averages 1.108 seconds (1,108 milliseconds); the manipulated versions of these stimuli vary slightly from these durations.

5.2.2 Duration measurements

Short sound files for 40 utterances from the Dialect Identification were examined in *Praat* using textgrids to mark segments for duration. The pre-tonic and tonic vowels occurring in the target word were marked at the onset and offset for duration measurements. In order to segment the vowel of the target syllable, it was necessary to determine vowel-consonant, and sometimes vowel-vowel, boundaries. This required setting guidelines to consistently choose the same point for vowel and consonant onsets.

Method for determining phoneme boundaries

All boundaries were marked at the zero crossing point of the onset for all segments. Both the waveform and spectrogram were used to determine the boundaries between phonemes. In vowel-vowel boundaries where the vowels differ in quality, the waveform was examined first, placing the boundary for the onset of the second vowel halfway through the waveform valley, so at the lowest point mid-wave. If the waveform showed no such dip, then the spectrogram was examined and the boundary was placed halfway through the transition of the second formant, first by visually locating the offset and onset of the steady state of each of the two vowels and then marking the boundary at the place equally distant between them. There were a couple of cases in which two identical vowels occurred in sequence across a word boundary containing the target word (as in ...*una_amiga*...). In these cases, a brief drop in intensity in the waveform was used and the boundary was placed in the middle.

The boundary between vowels and voiced nasal or liquid consonants, such as /n/, /m/, or /l/, or highly weakened [ð], is treated similarly, and the first formant is used primarily to determine this boundary, if it is visibly lighter. For boundaries between vowels and nasals and flapped or trilled /r/, the first complete wave cycle where that pattern deviates from the one before it in wave shape was found and the interval was placed at the zero crossing at the beginning of that first “new” wave. When this transition is less clear and the wave patterns don’t change form abruptly (because the approximant is weakened to be produced like a vowel, as in [β] or [ð]), the peak height in the waveform was examined and the first peak higher than the one preceding it was counted to indicate the change from the consonant to the vowel. Conversely from a vowel to a voiced,

weakened consonant, the boundary would be placed at the first peak decreasing in height from the one preceding, indicating a change in intensity.

In measuring voiceless plosives, such as /p/, /t/, /k/, the onset was determined to begin at the offset of the preceding voiced segment, or, if word initial, at the first irregular waves in the waveform. This includes the pause before the plosion. The offset of the plosive determined the onset of the following vowel, which was placed at the first zero crossing of the first wave in a repeating pattern. The irregular waves from the plosion were included as part of the plosive segment. The flap [ɾ] was treated similarly, using the surrounding vowel offset and onset with the waveform and formants to determine this segment. Many of the coda /s/ phonemes are aspirated, so these boundaries were determined similarly to those of plosives. Between aspiration and a plosive the noise present in the aspiration is used to determine the aspirated segment, and the offset is placed at the outer edge of the last vertical striation. If this was not clear enough, the waveform was used to mark the boundary at the last zero crossing of the aspirated energy. In cases where the boundary was not clear because the consonant was too weakened, or the vowel-vowel boundary shared the same vowel or did not show a visible change in formants, the target word was discarded and no measurements were made or included in this analysis.

Measurements of Dialect Identification tokens

All 40 natural tokens were analyzed in *Praat*, and text grids were made so that durations and pitch could be measured for each token. The text grid was fit with three interval tiers for measuring duration and one point tier for marking points for pitch measurements and alignment. The first tier, and first step, divided the token into phonemes, the second tier grouped syllables, and the third tier words. For this first step,

the entire token was segmented into phonemes, finding the boundaries between consonants and vowels in coarticulated speech (described above). These tokens had very few pauses, so many segments were coarticulated. For each word in the token, the duration of the tonic vowel was measured. For the target word, the word was divided into phonemes and syllables, which were marked pre-pre-tonic, pre-tonic, tonic, and post-tonic. Anything after the post-tonic was not included, but rarely occurred. Most target words did not contain all of these syllables, but all had at least a pre-tonic and tonic syllable. For the pre-tonic syllable, the durations of each consonant was also noted separately, marked as consonant onset and consonant coda (if present), in order to test for consonant lengthening in this syllable. In the tonic syllable, the duration of the vowel and the entire syllable were noted, including the durations of any consonants (vowel + any consonant onsets or codas). For all measurements, the segment was selected in Praat and the reading (in seconds) was recorded to the third decimal, rounding up when the fourth and fifth decimal digits were 55 or greater. This method of rounding up applied to all readings and measurements in this dissertation.

5.2.3 Pitch measurements

Next, the pitch was measured with an approach adapted from Colantoni (2011). This was done using a point tier to mark three points. The pitch measurements yielded three time measurements, marking point 1 at the onset of the tonic syllable, point 2 at the valley, or lowest point of the pitch before rising, and point 3 at the peak, or the highest point before leveling off and/or dropping. At each of these three time points, the time and the fundamental frequency (ERB) were noted. Lastly, the syllable in which the highest point (the peak) occurs and the boundary tone, if any, was noted.

Now we will explain step by step how these points were determined using the sound file together with the textgrid in which phonemes were segmented and syllables marked. To see the most continuous contour while enhancing the tonal movements, which were generally small, the *Praat* pitch window was set with ‘pitch settings’ to maximize pitch differences while fitting in highs and lows within the middle of the window. For most men this set the low at 30 Hz and the high at 200 Hz, and for most women the low was set at 50 Hz and the high at 350 Hz, but it was adjusted for each speaker before examining the curve and marking these points. Also, the view window was set to include the whole token, which was around 1 second in duration. An example of the waveform, pitch track, and textgrid for token id_05 *Así en la cocina* is shown in Figure 5.1.

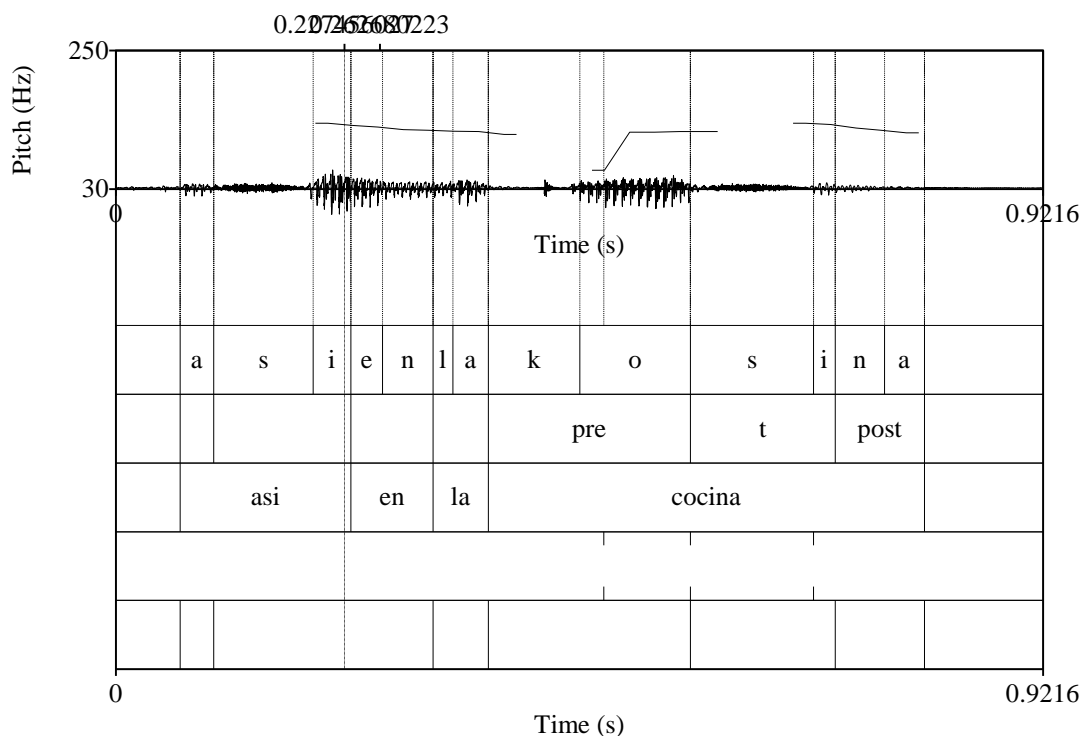


Figure 5.1 Pitch track, waveform, and textgrid for natural token id_05.

First, the onset of the tonic syllable was marked on the point tier, following the segmentation already performed for the duration measurements. The time and fundamental frequency (if any, since many words begin in a voiceless consonant) was noted for this pitch point. The second point was placed at the bottom of the valley. This is defined here as the lowest point immediately preceding the rise leading to the peak within the target word, which is in nuclear position. The valley may occur over vowels and nasals, but any pitch readings over other consonants were not included in this measure. This was to avoid marking the pitch reading in a location where it could be skewed by some consonants. Generally, the more voiced consonants meant the greater the segment that could be selected, as occurred with the target word *semana*. Usually, only the vowel part of the segment was viewed in the pitch measure, since many target words contained voiceless consonants, like *poquito*.

Before doing measuring the minimum and maximum pitch points, the pitch settings were adjusted to maximize the view of pitch movement by setting the highest minimum and lowest maximum for the pitch window. This aided in visually locating the highs and lows across the duration of the target word. The lowest point was meant to mark the valley before the rise of the pitch, and so first the peak was visually located, the segment of the target word preceding the peak was highlighted in the *Praat* window, and the command “Move cursor to minimum pitch” was used to find this point. The time point and the fundamental frequency (in ERB) were recorded for this second point. The third point marked the highest peak of the nuclear accent, also ignoring peaks over consonants, and using the *Praat* command “Move cursor to maximum pitch” to find the exact maximum point if the peak is broad. Lastly, the syllable in which the peak occurs was noted, whether it was in the pre-tonic, tonic, or post-tonic syllable, and if there was a

boundary tone after the target word (which is true for most tokens), the type of boundary tone was noted (L% or H%), as this information is important for understanding the general pitch characteristics of this analysis.

Disturbances in the pitch contour, causing it to rise suddenly, were noted for instance after a voiceless consonant like /s/ or /t/. These caused a pitch rise in the onset of the vowel following it, which was often the pre-tonic or tonic vowel. To avoid counting this elevation as a false peak, the pitch contour was evaluated starting after this rise. If after decreasing from the consonant rise the pitch rises again, even slightly, it would be counted as the peak. If the contour was only falling, then the contour was evaluated before this consonantal rise. In many cases of Córdoba and Buenos Aires speakers the contours were overall flat and with a deaccented pitch, making the location of a peak difficult to identify, especially where vowels were between voiceless elements, leaving an absence of measurable pitch or altered pitch readings. Three of the tokens were unmeasurable due to creaky voice or devoicing over too much of the target word, leaving no perceptible F0 reading.

For each token the internal phrase boundary, if any, was noted. Internal phrasing that is marked both by the presence of a LH% boundary and a short pause (Hualde 2005:272) was not common in these speech tokens. The majority of the tokens fit the broader description of internal phrasing in which an intonational break marks the division of two phrases, which would be incomplete sentences considered individually. Also, the break between these intonation groups is often made by a high boundary tone (H%) and a level or rising pitch at the end of the intonational group generally marks continuation, not finality. These are marked in the data as H%.

5.2.4 Syllable timing analysis

One final analysis of supra-segmental features deemed important for the production and perception of the *tonada cordobesa* was an analysis of phrasing. Phrasing considers how the syllables are divided across an utterance and which are prominent auditorily or impressionistically. Although a principle goal of this research is to provide experimental and acoustical evidence for these phenomenon, this analysis intends to substantiate the claims made in the previous, impressionistic studies regarding rhythm and to provide a phrasal level view of the prosodic outcomes of vowel lengthening. The method for this analysis is simple: each token is first divided into syllables by auditory assessment, so vowel assimilation across word boundaries results in fewer syllables than the underlying form for some syllable combinations. Then, auditory analysis confirms the prominent syllables, defining these syllables as those anchoring the timing between all other syllables. The rhythmic beat of a metronome aided in this step; prominent syllables were those that fell on the beat, non-prominent syllables fit in between the beats. The prominent syllables were marked with a diacritic for stress, “ ’ ”, and perceived vowel lengthening was marked with a colon, “ : ”. The end result of this auditory transcription looked like this: /'ma/se/pwe/pen:/'sar/ (id_01 *Más se puede pensar*), which notes the loss of a syllable that accompanies lenition, reducing *puede* to [pwe]. It was not important at this point to use narrow phonetic transcription. As seen in this example, most tokens had two such prominent syllables, with the second corresponding to the nuclear syllable, or the last stressed syllable of the utterance.

Four tokens were discarded, as they were the only ones to contain an intermediate boundary within the token: id_15 *tres semanas, no más*, id_23 *escuchar, tres*, id_35 *o*

sea, el primero, and *id_37 escuchar, uno.* All other tokens (n=18) represented one intonational phrase, or a partial phrase.

After an auditory impression of actually “hearing” these syllables as prominent and equally spaced, as if anchoring an overall rhythm, this organization was confirmed in *Praat*. The sound file was opened with an annotation window and an interval tier was used to mark off each phonetically produced syllable and the prominent points that had been marked in the auditory transcription. The phonetic segments already created for the duration measurements were used to find these syllable boundaries, which did not always correspond to the underlying form; for example, the token *así en la cocina* resulted in six syllables— /a/sjen/la/ko/si/na/— instead of seven.

In order to determine if these lengthened and prominent-sounding syllables were organized rhythmically in time, the duration mid-point was taken for each utterance, or token. To do this, the total duration of the utterance was divided in half and the mid-point was placed at the nearest syllable boundary within 40 milliseconds. If the mid-point of the utterance fell in the middle of a syllable and not within 40 milliseconds of either the onset or offset of the syllable, the duration mid-point for the utterance was marked halfway through that syllable, to maintain the most precise (within 40 millisecond) representation of the durational distribution of the syllables. This gives insight into the timing organization of the utterance, with regard to the number of syllables, the salient syllables, and the lengthened syllables.

The tokens were grouped by their number of (phonetic) syllables, which ranged from four to eight, with most utterances having five or six syllables. A visual examination found patterns of distribution for the features of interest.

5.2.5 Linguistic analysis

Other linguistic features are included in this analysis, and have been coded for each of the 40 Dialect Identification tokens. Some of the linguistic factors used in these analyses focus on the target word in the token (that which was manipulated in the experimental treatment of pre-tonic vowel duration) and even more specifically on the pre-tonic syllable of the target word. The linguistic factors and their frequency counts among the tokens are listed in Table 5.1. These features are meant to be used in conjunction with the other analyses; they are not in themselves an object of examination due to the low frequency of each type and combination of each type among the data.

The method of determining the first four linguistic features of the stimuli is straightforward. First, the target words in these tokens were categorized according to the position of stress within the word: nine were oxytone and thus had stress on the final syllable of the word, (e.g. *pensar*). Thirteen were paroxytone, with stress on the penultimate syllable (e.g. *Argentina*), and two were proparoxytone, with stress on the third syllable from the end (e.g. *película*) (see Table 5.1). Next, syllable number varied from four to nine syllables in the entire token. Third, of the target words, seven had closed syllables in pre-tonic position, and the other seventeen had open syllables. Fourth, The word type of the tokens included eleven nouns, three adjectives, seven infinitive verbs (e.g. *tener*), one preterit verb, one verb in the present tense, and one adverb (Table 5.1).

1. Target word – stress type	Oxytone = 9 Paroxytone = 13 Proparoxytone = 2
2. Total syllables in token	Min. = 4 Max. = 9 Avg. 6.5
3. Pre-tonic syllable type	Closed = 7 Open = 17
4. Target word class	Noun = 11 Adjective = 3 Verb, infinitive = 7 Verb, preterite = 1 Verb, present = 1 Adverb = 1
5. Position of the token in intonational context	Phrasal (P) = 6 Phrase final (Pfinal) = 4 Utterance (U) = 4 Utterance final (Ufinal) = 4 Phrase and Utterance final (PUfinal)= 3 Utterance medial (Umedial) = 3
6. Intonational phrase type	Neutral declarative = 22 Declarative enumeration = 2

Table 5.1 Linguistic features and their distribution counts across the Córdoba speaker tokens (n=24) in the Dialect Identification task.

The intonational position of the token within the greater context is described as follows: The token may constitute an entire intonational phrase, (P), which includes the beginning to the end of an entire phrase contained within an utterance, but not in utterance final position. The phrase type token (P) may end as a discontinued list, ellipsis (...), or short pause (comma). If the beginning part of the phrase is not included in the token, but the final part is, then it is considered phrase final, or (Pfinal). Some tokens constitute an entire utterance, (U), marked by a full stop at the end and preceding it. More commonly these short utterances contain only the final part of an utterance, (Ufinal),

which is differentiated from P and Pfinal by terminating in a long pause and completing the grammatical sentence, but this segment is preceded by other phrases or words. In some cases, the token is an entire phrase that occurs at the end of an utterance, and so it is marked with both codes, (PUfinal). Thus far, all of these intonational types characterize finality and place the token, and thus the target word, in final position of a phrase or utterance. The last position describing these tokens is a medial one, (Umedial). These tokens (of which there are only four) occur at the beginning or middle of an utterance and/or reach across phrasal boundaries, including the end of one phrase and the beginning of another, for instance *o sea, el primero*. Even if the token contains an end of a phrase, it also contains the beginning of another one, and so is not counted as a final-type of intonation.

The last measure also deals with intonation and describes the contour type of the token. This was controlled to include only declarative and neutral utterances, in which all information is new; contrast or focus is not used in any elements. For two tokens, however, the intonation differs since they occurred within an utterance that enumerated single word responses as these speakers gave ratings for specific skills (reading, writing, etc.) (e.g. *Escuchar, uno... eh, Hablar, uno. Y escribir, tres.*). As all of these tokens from Córdoba speakers were collected during sociolinguistic interviews in which speakers responded to open-ended questions about their lives, the declarative neutral intonation was frequent. But the enumeration style was used in response to an interview question asking informants to rate their language proficiency along a numerical scale.

The variation observed across all tokens with respect to these linguistic features provides a nuanced and complex view to the perception of individual tokens. Broad generalizations are not possible in this type of analysis. Instead, these linguistic features

may give explanatory force to the larger patterns seen with prosodic variables and perception responses.

5.2.6 Perception token selection

To analyze the productions of the speakers, excerpts of speech were first selected, as described in section 4.2.1. These stimuli were presented in a perception test of dialect identification, as described in section 4.2.2. Whereas all tokens used in the experiment are measured for duration and intensity, and the results are reported in this chapter, additional statistical analysis on the production measures are also informed by the results from the perception tests.

One of the objectives of this analysis was to use the perception results to determine the specific tokens that are perceived as sounding more or less Cordoban, and to discover how this correlates to their acoustical characteristics. The selection of the tokens was determined by the listeners' ability to accurately identify the speakers despite manipulation of their speech. This is considered a positive identification. A second type of response is also of interest in the selection, the listener's *inability* to accurately identify a speaker, even in natural (un-manipulated speech), referred to here as a negative identification. The prominence of these two types of identification is dependent on a dichotic relationship between the natural and manipulated stimuli, in which the natural stimuli are consistently identified correctly and the manipulated stimuli are consistently identified incorrectly. Since this pattern was found to be significant in the ANOVA tests in the Dialect Identification analysis, the use of the listeners' results was determined to be consistent enough to provide the next step in selecting tokens for acoustic measurement.

Both positive and negative identifications present interesting results of perception. A positive identification means there were other acoustic cues more prominent than the

pre-tonic vowel duration, and that mark the regional identity of the speaker even though these cues were distorted by the manipulated signals. A negative identification shows the opposite: the failure to identify a speaker's region of origin even when all signals were uncontradictory (left untouched). The reasons for either type of identification are discussed in the final section of this chapter. For this analysis, we use the 50% accuracy mark to determine what is considered an accurate response (50% or greater) or an inaccurate response (<50%). The average accuracy rates from across all listener groups were used. A natural token with an accuracy rate of less than 50% was marked for a negative identification. A manipulated token with an accuracy rate of 50% or greater was marked for a positive identification. These tokens were then traced to the speaker and the utterance.

5.3 RESULTS AND DISCUSSION

This section reports the results of the acoustic measurements performed on the speech stimuli. They are presented as qualitative analyses as the large amount of variation within tokens and the small amount of total tokens to be measured does not allow for tests of statistical significance. The measures are presented and discussed individually, although many measures will necessarily be discussed together.

5.3.1 Pre-tonic vowel duration

The longest and shortest pre-tonic vowel durations from tokens in the Dialect Identification stimuli are from Córdoba speakers, at .194 seconds and .035 seconds respectively. The average for this group (109ms, n=24) is nearly double that of Buenos Aires speakers (59ms, n=8), and about 50% longer than the average of the Tucumán speakers (72ms, n=8); see Table 5.2. It is justified to say that the naturalistic data in this

study support the evidence for significant pre-tonic vowel lengthening in the Córdoba dialect.

Pretonic Vowel	Córdoba	Buenos Aires	Tucumán	All tokens
Min Nat. Dur (ms)	35	47	59	35
Max Nat. Dur (ms)	194	75	102	194
Avg Nat. Dur (ms)	109	59	72	91

Table 5.2 Minimum, maximum, and mean pre-tonic vowel durations for dialect groups and across all tokens.

While the author’s previous study (Lang 2010) measured only vowels in pre-tonic and tonic positions, this dissertation measures also the syllable, taking into account the potential for duration variation in the consonants. Furthermore, measures of the pre-pre-tonic syllable and the post-tonic syllable (when they are present in the target word) are used to calculate the ratios of the relative durational differences of the pre-tonic and tonic syllables – not only to each other, but to these other syllables which have been shown to lengthen in certain contexts. For instance, final lengthening that marks a tonal boundary occurs in narrow focus intonation in Spanish (Face 2000; Hualde 2005; Prieto 2010), and in neutral declarative intonation in the Buenos Aires “long fall” (Kaisse 2001; Colantoni and Gurlekian 2004; Colantoni 2011).

The longest pre-pre-tonic syllable is found among the Buenos Aires speakers, and the pre-pre-/pre-tonic ratio shows it is indeed longer than the pre-tonic vowel for these tokens. The Tucumán tokens did not have target words containing a syllable in pre-pre-tonic position, and so are not included in this measure. The ratio of the pre-pre-tonic syllable for Córdoba speakers (.526) indicates that this syllable is nearly half of the duration of the pre-tonic syllable across all measured tokens (n=9).

The pre-tonic syllable durations show a pattern similar to those of the pre-tonic vowel durations, in that Córdoba has the longest duration on average, which is nearly double of that of Buenos Aires speakers but only about 9% longer than the average for the Tucumán speakers (Table 6.3). When compared to isolated syllables the relative lengthening is not apparent; as we look at the durations of the surrounding syllables and their ratios, the duration for Tucumán speaker tokens does not seem as remarkable.

The tonic syllables are longer on average for the Córdoba speaker tokens than the Buenos Aires speakers, but longest of all groups for the Tucumán speakers, at 228ms. For the Tucumán tokens the tonic syllable presents the longest syllable, which is expected for standard dialects of Spanish as well. The post-tonic syllable is nearly as long as the tonic in the Tucumán tokens, but this may be due to two outliers, (at_73, at_75) which contain an intonational boundary unlike all others. These tokens show an exaggerated final lengthening, used stylistically by a single speaker to mark continuation at an internal boundary; the lengthening affects the last syllable of the token, which was the post-tonic syllable. This led to two measures within this group (out of 8) that were unusually long; the vowel of one in particular (at_73, the last /a/ of *Marina*) was 459ms long. The token, *hoy vi a Marina...* stretched this final vowel throughout the pause, before the speaker finished the utterance, in what is intonationally a declarative neutral statement. The post-tonic syllable measurements for these two tokens likely influenced the mean for the Tucumán group affecting the tonic/post-tonic ratio as well (Table 5.3).

	Córdoba		Buenos Aires		Tucumán	
	Duration (ms)	n tokens	Duration (ms)	n tokens	Duration (ms)	n tokens
Prepre-tonic Syllable	112	9	162	3	-	0
Pre-tonic Syllable	213	24	133	8	195	8
Tonic Syllable	182	24	158	8	228	8
Post-tonic Syllable	146	16	201	7	222	8
Ratios						
Prepre/Pretonic	.526		1.434		-	
Pretonic/Tonic	1.170		0.842		0.855	
Tonic/Posttonic	1.247		0.786		1.027	

Table 5.3 Duration averages for four syllable positions and three speaker groups and the ratios of duration averages.

The ratios for the pre-tonic and tonic syllable reveal Córdoba as the only group in which the average pre-tonic syllable is longer than the tonic vowel within the same word, with a ratio of 1.170, while for the Buenos Aires and Tucumán speakers the pre-tonic syllable is .842 and .855 as long as the tonic syllable, respectively. Despite the Tucumán pre-tonic syllable duration being quite long, the tonic syllable duration is even longer, 228ms, maintaining the tonic syllable as the longest syllable in the word.

The post-tonic syllable is shortest for the Córdoba speakers in duration, 146ms, compared to the means for Buenos Aires and Tucumán speakers (201ms and 222ms, respectively). The ratios show that the post-tonic syllable is shorter than the tonic syllable for the Córdoba group and the Tucumán group, but the Buenos Aires speakers actually have a post-tonic syllable that is longer than the tonic syllable on average. Colantoni (2011) found that the BAS group had the lowest ratio differences of tonic to other syllable durations as well as a tonic duration closest to the pre-tonic than the other varieties (Western San Juan, Central, and Northeastern dialects). However, Colantoni

also reported that her Buenos Aires data revealed overall more final lengthening, including the tonic and post-tonic syllable. Pešková et al. (2012) investigate syllable duration and peak alignment in a prosodic study of Buenos Aires Spanish speakers producing spontaneous speech and find a hierarchy of lengthening. The syllable types are ordered as follows from longest to shortest duration: nuclear syllables of oxytone words > nuclear syllables in proparoxytone and paroxytone words > pre-boundary syllables > pre-nuclear syllables. The results reported from the present study are drawn from measurements of syllables in nuclear position in oxytone, paroxytone and proparoxytone words, thus accounting for the two categories ranked for the longest duration. The lengthening of the Buenos Aires tokens, then, is consistent with the previous research reporting final lengthening which spreads across all final syllables, with little differences between them (compared to the Córdoba and Tucumán data).

What does pre-tonic lengthening mean for Córdoba Spanish? The lengthening of the pre-tonic vowel or syllable should not be correlated with a stress-shift, as Malmberg (1950) suggested. Although the stressed syllable (referred to as the tonic syllable here) is lengthened in Spanish, lengthening should be seen as only a correlate of stress; a longer duration cannot be taken to indicate a stressed syllable, nor vice versa (Hualde 2005:244). Additionally, the stressed syllable in Spanish does not necessarily have the highest pitch or an intonational peak, but rather this syllable serves as an anchoring point for pitch movements (Hualde 2005:244). There is no evidence in the present measurements that the correlates of stress are not present in the tonic syllable, nor that they have been transferred to the pre-tonic syllable. It appears that lengthening spreads from the tonic syllable to the pre-tonic syllable in nuclear position, which is the only position tested here. The remaining pitch analyses will further test these conclusions.

5.3.2 Peak alignment

The fundamental frequency (F0) was measured at three points in the target word of each token: 1) the onset of the stressed syllable, 2) the lowest point (the valley) before the peak, and 3) the peak, or highest point reached over the word discounting rises due to boundary tones. These points sometimes occurred in that order sequentially, although for many Córdoba and Tucumán tokens the valley began before the onset of the stressed syllable. These three points, onset, valley and peak, are plotted in Figure 5.2 for the averages across the tokens from the three dialect groups, with the F0 in ERB on the y-axis and the time latency (with 0 as the onset) on the x-axis.

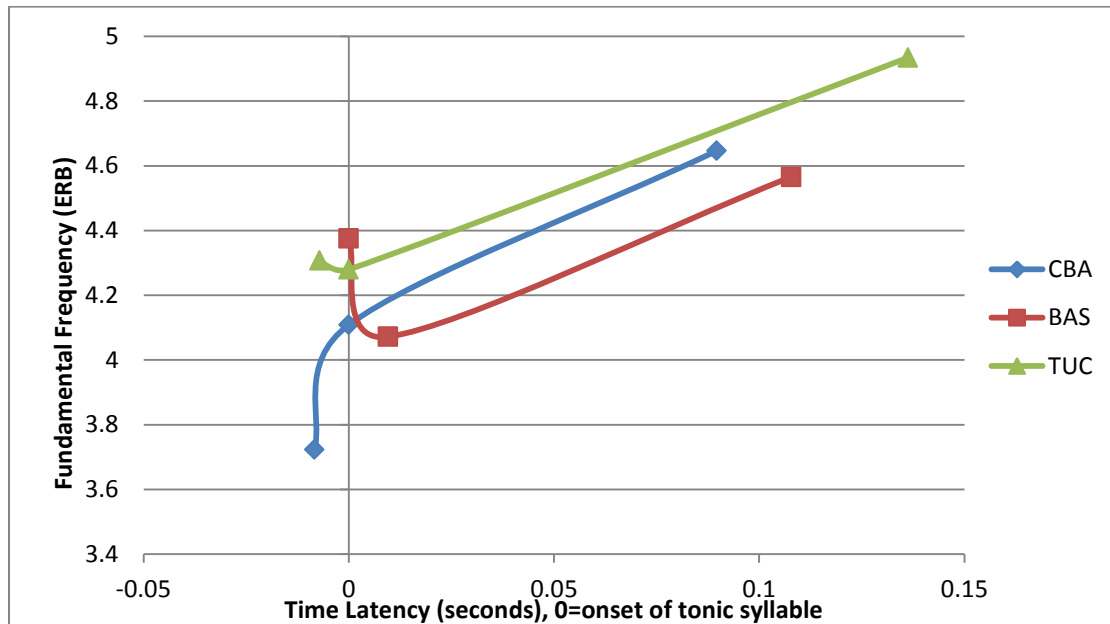


Figure 5.2 Nuclear pitch curves for Dialect Identification tokens.

The Córdoba data show a pitch curve unlike that of Buenos Aires and Tucumán speakers for the nuclear accent in these words, in that the valley is realized before the stressed syllable onset. The measurements shown on the graph indicate very small

differences of time latency between the three points for which the fundamental frequency was noted, and of course do not describe the rest of the pitch curve, but we can see immediately this difference of latency and ordering. The Buenos Aires and Tucumán pitch curves realize the valley, or at least the lowest point before the rise begins towards the peak, within the stressed syllable (i.e. after 0, on the graph). The Córdoba pitch curve contains this valley entirely outside of the stressed syllable: the pitch has already started to rise when the onset of the syllable begins at 0. Although all three dialects realize the peak within the stressed syllable, the difference of early valley alignment may account for the perception of an early stressed syllable, observed in the previous impressionistic work on the *tonada cordobesa* (c.f. Malmberg 1950; Vidal de Battin 1964; Fontanella de Weinberg 1971; Yorio 1973), and especially when combined with the pre-tonic vowel lengthening. Consequently, the early valley leads to an early peak, as indicated by the means for the Córdoba data in Figure 6.1. The Tucumán data account for the longest rise measured here, starting right at the onset of the stressed syllable and continuing for 136ms on average.

The means for peak latency in Figure 5.2 show that all three dialects reach the peak after the onset of the tonic syllable. On average, the Tucumán speakers reach this peak the latest, and Córdoba speakers the earliest. The Tucumán tokens were by far the most consistent, with 7/8 tokens reaching the peak in the tonic syllable. In the eighth case the peak was post-tonic. The other two dialect groups showed more diversity. Córdoba speakers reached the peak in the pre-tonic syllable in 5/23 tokens, the tonic in 13/23 tokens, and the post-tonic in the remaining 5/23 tokens. Buenos Aires tokens, though much fewer, showed a similar mixed distribution: 1 pre-tonic peak, 2 tonic, and 2 post-tonic (only 5 of 8 tokens were measurable for pitch). A multi-dialectal study of Argentine

Spanish intonation (Colantoni 2011) found that both Buenos Aires and Córdoba intonation curves showed faster rises to low peaks, which fell more steeply than the other dialects studied (Northeastern and Western Argentine varieties) in nuclear position for declarative utterances. Specifically, the Buenos Aires speakers in Colantoni's study showed early peak alignment but not early valley alignment, similar to the results reported in the present study. Both the valley and peak occurred within the tonic syllable. The valleys and rises may reveal an important difference between the three dialect groups. Córdoba tokens show the earliest valley and earliest peaks. The slope duration is about the same as that from Buenos Aires tokens, but these tonal events occur earlier. The Buenos Aires token slope fits the descriptions made by previous linguists. The valley and peak are close together (likely within the same syllable), and so the rise is fast and the peak alignment is early compared to standard Spanish for declarative neutral utterances (Kaisse 2001; Colantoni & Gurlekian 2004; Hualde 2005). For Tucumán speakers as well, these results are not surprising. This dialect has been described as having lengthened tonic syllables (Rojas 2000), which would allow time for the peak to be reached within this syllable.

5.3.3 Syllable timing

As is mentioned in the introduction and methodology of this chapter, other prosodic factors were considered in addition to duration and peak alignment. Of the potential candidates, intensity was discarded and phrasing was instead chosen, as the latter was deemed more likely to produce results that are relevant and unique to the *tonada cordobesa* as a prosodic and intonational phenomenon. The results from this analysis point to a pattern of prominence and lengthening, which appears to create a balanced distribution of stress across syllables in the tokens. This is to say, the prominent

syllables are distributed symmetrically in these utterances and the lengthened syllable is placed predictably before the last prominent syllable and at the durational midpoint of the utterance. The number of syllables thus is unequally distributed across the duration of the utterance. This leads to a pattern in which the first half of the utterance has more syllables than the second half, and lengthening occurs in the second half. Keep in mind that the syllables referred to here are those produced phonetically, or after processes of assimilation have reduced and combined syllables. If the number of syllables in the underlying form were counted, this would result in an even greater numerical imbalance of syllables between the two durational halves of the utterance.

The results for each of the tokens (n=20) are shown in Table 5.4. Each syllable is represented with its duration in seconds and the duration mid-point (within approximately 5-40ms) is shown with a vertical line. Not all 24 tokens were fit for this analysis, which included only those tokens that were positioned finally in the intonational phrase or utterance (P, Pfinal, U, Ufinal, or PUfinal) and had declarative, neutral intonation.

#	token#	transcription	Phrasal Position	Syll1	Syll2	Syll3	Syll4	Syll5	Syll6	Syll7	Syll8
1	id_01	más se puede pensar,	Pfinal	MA	se	pue	pen:	SAR			
				157	120	238	296	227			
2	id_13	le fui a visitar.	Ufinal	le	FUIA	vi	si:	TAR			
				78	150	60	113	142			
3	id_43	tenés que tener...	Phrase	TE	neh	que	te:	NER			
				74	100	120	231	174			
4	id_45	En el neonatal,	Phrase	E	nel	neo	na:	TAL			
				86	290	173	228	312			
5	id_07	la secundaria.	Phrase	la	SE	kun:	DA	ría			
				81	100	198	176	185			
6	id_09	viernes pasado...	Phrase	VIER	nes	pa:	SA	do			
				122	139	233	223	111			
7	id_33	Somos humanos.	Utterance	SO	moh	u:	MA	noh			
				201	142	117	139	170			
8	id_47	siempre un poquito...	Pfinal	SIEM	preun	po:	KI	to			
				268	197	224	218	38			
9	id_31	por las películas	Umedial	POR	la	pe:	LI	ku	la		
				96	115	164	103	73	53		
10	id_05	Así en la cocina.	Utterance	a	SIEN	la:	ko:	SI	na		
				34	218	55	201	144	89		
11	id_17	dentro de la Argentina.	P and U final	DEN	tro	lar:	gen:	TI	na		
				122	165	148	247	128	139		
12	id_29	tenés que aprenderlo.	Ufinal	TE	neh	kea:	pren:	DER	lo		
				89	100	89	307	110	128		
13	id_39	volví de Malvinas...	Pfinal	vol	VI	de	mal:	VI	nas		
				172	63	78	190	132	293		
14	id_41	el año pasado...	Pfinal	e	LA	nio	pa:	SA	do		
				20	86	182	223	147	84		
15	id_11	un par de semanas...	Ufinal	un	PAR	de	se:	MA	nas		
				90	141	60	215	148	167		
16	id_21	en la secundaria...	P and U final	EN	la	se	kun:	DA	ría		
				28	90	116	192	157	87		
17	id_19	pero no lo sé traducir...	Phrase	PE	ro	NO	lo	se	tra	du:	SIR
				103	60	115	102	162	202	120	299
18	id_27	vamos a ver cómo termina	P and U final	VA	moa	ver	KO	mo	ter:	MI	na
				80	162	82	161	113	296	188	161

Table 5.4 Tokens divided by syllables, durations of each noted below in seconds; the mid-point of the utterance duration is marked with a vertical line. Auditorily long vowels are marked by a colon and prominent syllables by capital letters.

The five-syllable tokens show two basic patterns visible at the end of the utterance. For instance in tokens 1-5 the last syllable of the utterance (and thus the word) is prominent, and is also in nuclear position of the phrase. In each case these are preceded by a lengthened pre-tonic syllable, which is preceded by the mid-point marker, thus dividing the segment in half with the long pre-tonic and tonic in the second half and all other syllables timed to make up the first half of the duration of the utterance. In tokens

6-8 we see almost the same pattern: only these nuclear positioned words are paroxytone instead of oxytone, and so a post-tonic syllable is also included in the second half of the utterance. The mid-point is then shifted to partway through the lengthened pre-tonic syllable. Tokens 1-8 all exhibit a balance that weights a lengthened pre-tonic and nuclear syllable nearly equally to the rest of the utterance, as regards the timing of the syllables. The post-tonic syllable does not equal the weight of the pre-tonic, and so about half of the duration of the latter is added to balance out the second half of the utterance with the first.

The six-syllable tokens also show a pattern related to the stress of the word in nuclear position. The sole token with a proparoxytone word, *películas*, in token 9, also shows the earliest duration mid-point, halfway through the lengthened pre-tonic /pe/ which is the third syllable in this utterance, leaving 3.5 syllables in the second half. Tokens 10-16 contain paroxytone words in nuclear position and show duration mid-points before or during the fourth syllable, which is the lengthened pre-tonic syllable. This divides the utterance like the five-syllable tokens mentioned above, with the first half having more syllables and the second half beginning with the lengthened pre-tonic vowel. Together with the nuclear syllable and any post elements, the pre-tonic vowel balances out the timing of the utterance.

There are only two tokens with seven-syllables, and like the previous examples they display an imbalanced number of syllables, with five in the first durational half and three in the second half. The second half is made up of the tonic, pre-tonic, and the pre-pre-tonic syllable in the oxytone nuclear word in token 17. While token 18 is a paroxytone word in the same position, the relative weights are balanced by the second half, which contains the pre-tonic, tonic, and post-tonic syllables.

It is remarkable that the division of the utterance is similar for tokens with five, six, or eight syllables. It seems the durational timing of the utterance concentrates all of the syllables preceding the pre-tonic and tonic syllables in the first half of the utterance, and allows these two syllables to form the second half of the utterance when the nuclear word is oxytone. When a post-tonic syllable is added to the nuclear (second) half, the boundary then cuts the lengthened pre-tonic syllable in half, as it would not “fit” with the tonic and post-tonic. Counted together they are too long except in tokens with eight syllables, in which these three final elements balance out the first five.

It appears that lengthening of the pre-tonic syllable is nearly obligatory in words in nuclear position, as suggested by Yorio (1973) for spontaneous speech, and in accordance with Fontanella de Weinberg’s (1971) description of the most frequent place for lengthening to occur. Lengthening in nuclear position and before boundaries is expected in all varieties of Spanish. This can be achieved by lengthening the tonic syllable, which is already stressed and thus longer than if it were elsewhere in the utterance. Lengthening can spread to surrounding syllables, and Hualde and Chitoran (2003) found it is more likely to spread to the pre-tonic syllable than other syllables. The pre-tonic syllable is certainly lengthened in the present study, and often it is twice as long as the tonic syllable in these data. The syllable timing is potentially controlled by lengthening the pre-tonic, and the tonic and post-tonic syllable are possible candidates for lengthening as well, in order to create a rhythmically balanced utterance centered on the pre-tonic syllable.

It remains uncertain what these observations signify for the rhythmic pattern of the *tonada cordobesa*. It seems as if the utterance is timed around the prominent or stressed syllables, balancing the nuclear constituents (tonic and pre-tonic, or tonic, post-

tonic and part of pre-tonic) against the prenuclear constituents. The lengthened pre-tonic syllable, in these cases, is timed to occur at the center of the utterance, so that perceptually, the elements before and after it sound equally proportioned, and the stress or prominence is equally distributed across the lengthened syllable. This finding seems strange, as it illustrates a timing of stress across unbalanced syllables, for a language that is syllable-timed and not stress-timed. English is stress-timed and, in turn, shows greater duration differences than Spanish between stressed and unstressed syllables. This leads to reduced vowels in unaccented syllables in English, while Spanish is known for vowel reduction only in a few dialectal varieties, Mexican and Andean (Lope Blanch 1966). Yorio (1973) suspected vowel reduction as one of the salient features characterizing the *tonada cordobesa*. He examined all vowels in his speech data and found some cases of reduction of /e/ (to [ə]) in unstressed vowels of spontaneous speech; read speech showed no reduction, nor did stressed syllables or high vowels, /i/ and /u/ (Yorio 1973). Vowel quality was not assessed in the present study, but it may be worthwhile to pursue investigation of the rhythmic qualities of the *tonada cordobesa* to better understand how stress and duration are realized at the phrasal level.

A large degree of lengthening is found to describe the syllable durations for Córdoba Spanish as well, both in the present study and in past research on the *tonada cordobesa* (Fontanella de Weinberg 1971; Yorio 1973; Lang 2010). While Fontanella de Weinberg's (1971) description of the prosody and intonation of Córdoba Spanish has been referenced throughout this dissertation, her observations on the combined features of lengthening, tone, and rhythm characterize a pattern for the *tonada cordobesa* that is also apparent in the rhythmic and durational conclusions resulting from the present data set. Fontanella de Weinberg found that Córdoba Spanish has a predominantly syllabic

rhythm (i.e., that which is expected for Spanish), but this rhythm may be altered by lengthening the pre-tonic syllable. In fact, she finds that this lengthening occurs nearly obligatorily at the end of the intonational phrase and is accompanied by a tonal glide. She additionally observes that when syllabic lengthening is present, that particular syllable (i.e., the pre-tonic) and those that follow it (i.e., the tonic and post-tonic syllables) constitute the *núcleo* “nucleus” of the pitch contour. Despite our differences in approach, this dissertation supports Fontanella de Weinberg’s conclusions that the *tonada cordobesa* has a rhythmic pattern that contradicts its syllable-timed nature. Further analyses are needed at this point to expand upon this finding, which is likely to contribute new insights to our understanding of the perceptual saliency of this dialect, and of Spanish prosody in general.

5.3.4 Perception and acoustic characteristics

The final part of the acoustic analysis returns to the perception results to add further dimensions of interpretation. The mean accuracy for Dialect Identification (chapter 4) was 57.3% and the average accuracy for each token range from 19% correct identification to 96.8% correct. Of the 24 Córdoba tokens (12 speakers) 11 were perceived as being from Córdoba less than 50% of the time (negative identification) and 2 tokens (1 speaker) received positive identifications and were correctly identified above a 50% rate for even the manipulated version of the token.

Of primary interest in this dissertation is the vowel lengthening phenomenon. The ratios of tonic/pre-tonic (T/Pre) syllable duration show that six of the eleven tokens did have a lengthened pre-tonic syllable, which was at least as long as the tonic. In looking at the other syllable duration ratios, unusual pre-pre-tonic (PP/Pre) ratios are found for two tokens in which the pre-tonic syllable is shorter than the pre-pre-tonic. In both of these

cases the pre-tonic was shorter than the tonic syllable as well. The post-tonic ratios (T/Post) are unexpectedly short for only one token, id_39, in which the tonic syllable is about half the duration of the post-tonic in this token.

Of the eleven negatively identified tokens, six speakers are represented, meaning in all but one case the speaker was negatively identified for both of his or her tokens in this experiment. Of these speakers four were rated upper-middle class, and two working-middle class. They are balanced in gender and tend towards the older age group more than young (Table 5.5).

token	speaker	transcription	target	Syll	%correct	PP /Pre	T/Pre	T/Post
id_13	YUF1	le fui a visitar.	visitar	6	22.2	0.531	1.257	.
id_15	YUF2	tres semanas, no más	semanas	6	26.9	.	0.917	1.006
id_17	AUF1	dentro de la Argentina.	Argentina	8	39.7	0.393	0.514	0.914
id_19	AUF2	pero no lo sé traducir...	traducir	8	39.7	1.566	2.318	.
id_21	AUM1	en la secundaria.	secundaria	7	14.3	0.604	0.818	1.805
id_23	AUM2	Escuchar...tres .	escuchar	7	30.1	0.380	1.209	.
id_25	AWF1	me costó mas, eh,	costó	5	15.9	.	0.226	.
id_33	OWM1	Somos humanos.	humanos	5	30.1	.	1.219	0.818
id_35	OWM2	O sea, el primero.	primero	7	49.2	.	0.487	1.418
id_37	OUM1	Escuchar, uno...	escuchar	5	19	1.139	2.504	.
id_39	OUM2	volví de Malvinas...	Malvinas	6	27	.	0.695	0.451

Table 5.5 Negatively identified tokens of Córdoba speakers and syllable duration ratios.

The tonic/pre-tonic syllable duration ratio is shown in Table 5.5, and cases in which this ratio indicates a longer pre-tonic syllable relative to the tonic are highlighted. This results in six of the eleven negatively identified tokens having a ratio of less than one, which is indicative of a tonic vowel that is shorter than the pre-tonic. This was expected to induce a correct identification of a Córdoba speaker. However, this was not the case for these tokens, and so other linguistic features must be responsible for their

misidentification. In these tokens pre-tonic syllables are usually longer than pre-pre-tonic syllables when they occur, which is also expected for this dialect.

The pitch curve for the target word in these negatively identified tokens (n=11) was compared to the correctly identified tokens (n=12) to explore possible differences in valley alignment and frequency, or peak alignment or frequency. The results for fundamental frequency at three time latency points are shown in Figure 6.2. For the negatively identified tokens (mis_ID) the valley occurs before the tonic syllable onset and rises quickly to reach an early peak, compared to the correctly identified (CBA_id) means. The latter show a valley aligned within the tonic syllable and occurring just after the onset, thus rising over a greater time to peak slightly higher than the misidentified tokens (Figure 5.3).

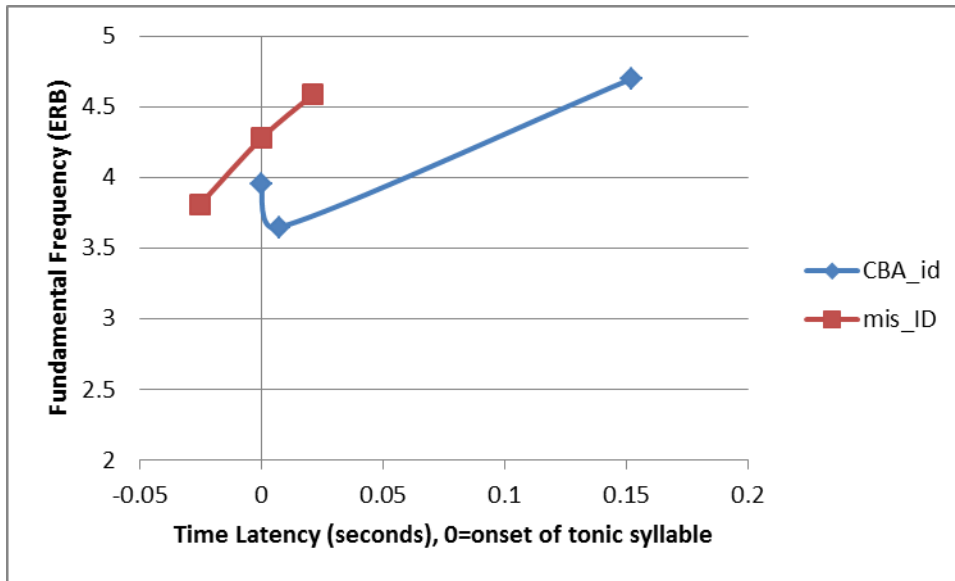


Figure 5.3 Comparison of nuclear pitch contours for correctly identified Córdoba speakers (CBA_id, n=12) and negatively identified Córdoba speakers (mis_ID, n=11).

The slope shown for the correctly identified Córdoba speakers is more similar in shape to that of the Buenos Aires speaker tokens (Figure 5.3), while the negatively identified Córdoba speakers show a slope more similar to the Córdoba data when combined. However, there is a difference in that the peak is reached much earlier in the misidentified speakers. In fact, the duration of the rise from valley to peak is only 46.5ms for these tokens, which is much faster than any other slope measured. All Córdoba tokens combined (n=23) average 98ms, which is about double that of the negatively identified tokens. This unusually fast slope may account for these tokens being misidentified, as such a contour would likely be difficult to perceive and so provide less acoustic information for the listener to determine the speaker's dialect. If this is the case, then perhaps the intonational contour is in fact as important a cue for dialect identity as pre-tonic vowel duration has proven to be. With so few cases in these limited linguistic

contexts we can only confirm this belief with an experimental test, similar to the Dialect Identification one, manipulating pitch in the perception of dialect.

The next tokens we are interested in are the positive identifications, or those tokens that, when manipulated and the pre-tonic vowel shortened, were still identified positively for a Córdoba origin above chance (>50%). Two of the manipulated tokens, id_06 and id_08 were positively identified for a Córdoba origin 79.3% and 66.7% of the time, respectively (Table 5.6). Both of these tokens came from the same speaker, YWM1 and are shown in Table 5.6. with their natural pairs, id_05 and id_07.

token	speaker	transcription	target	Syll	%correct	PP/Pre	T/Pre	T/Post
		Así en la						
id_05	YWM1	cocina.	cocina	7	96.8	.	0.716	1.618
id_06	Manipulated (shortened)				79.3	.	1.019	1.618
		En la						
id_07	YWM2	secundaria...	secundaria	7	96.8	0.510	0.889	0.951
id_08	Manipulated (shortened)				66.7	0.748	1.304	0.951

Table 5.6 Positively identified manipulated tokens (and their natural pairs) of Córdoba speakers and their syllable duration ratios.

The identification of the natural tokens was even higher, 96.8%, making this speaker the most *cordobés* of the group. He is a young male of working-middle class and shows pre-tonic vowel lengthening in both tokens, as indicated by the ratios. The manipulation, which affected only the duration of the pre-tonic syllable, changed only the ratios involving this syllable, which are marked in the table with bold, italic font. Shortening the pre-tonic vowel in these two tokens resulted in tonic/pre-tonic syllable ratios in which

the tonic syllable is longer than the pre-tonic, which would be expected for a more standard pronunciation. For token id_06 the tonic syllable is still barely longer than the tonic (ratio = 1.019), even though the pre-tonic has been halved. Token id_08 shows a greater difference between the two syllables. For this manipulated token the post-tonic syllable (185ms) is longest in the word, followed by the tonic (176ms), the pre-tonic (135ms), and the pre-pre-tonic (101ms) syllables. This results in an ordering where the syllables get longer throughout the word. For token id_06 the duration ordering is tonic (144ms), pre-tonic (141ms), and post-tonic (89ms) syllables, quite different from id_08, and yet both were positively identified. These two tokens both seem to have different slopes as well, with the valley of id_06 before the onset and rising rapidly to an earlier peak than id_08, whose valley is post-onset. It is hard to pinpoint what prosodic or intonational feature accounted for these two tokens being consistently associated with a Córdoba identity.

While this analysis has explored a variety of linguistic features, there are other characteristics, including voice quality, which remain open for exploration in these data. Furthermore, a speaker specific variable would account for the consistency of token identification for the same speaker. The possibilities have not been exhausted with this research, but these initial steps have already revealed several acoustic and social features characterizing the *tonada cordobesa*.

Chapter 6: Discussion and Conclusions

6.1 INTRODUCTION

This final chapter concludes our examination of the *tonada cordobesa* perception, the acoustical features that define it and the attitudes surrounding it. This dialect has proven to be worthy of this attention to its features. It has revealed prosodic and intonational realizations unique among Spanish dialects and socially indexed the meaning linked to these acoustic features. The fact that listeners are able to distinguish the dialect origin of these speakers in short samples of speech is complicated by the multiplicity of prosodic correlates found in the samples from Córdoba speakers. The complexities of the *tonada cordobesa* are further discussed in the remainder of this chapter.

The chapter begins by recapitulating the goals of the larger dissertation. The problems encountered in the data collection and analysis are then discussed. A summary of the results surrounding *la tonada cordobesa* and Córdoba identity ensues in section 6.2. Section 6.3 introduces the contributions this dissertation makes to dialect and prosody perception, Spanish dialectology and intonation as well as the theoretical implications of this research for the Spanish prosody. Sections 6.4 and 6.5 recount the general conclusions of the project and set out future directions of study.

6.1.1 Purpose and goals of the dissertation

This dissertation set out to investigate the linguistic characteristics of the *tonada cordobesa* through listener perception. The aim was to discover the importance of vowel lengthening in the discrimination of this dialect among Argentines and to describe the linguistic features that are associated with this dialect and that induce perception of a Córdoba identity. A perception test was designed to gather perceptual data on dialect

identification. This test was analyzed along with acoustical and linguistic features of speech samples from Córdoba, Buenos Aires and Tucumán speakers.

The research question motivating the experiment and analysis in this dissertation can be described as such: what linguistic features make the *tonada cordobesa* unique among dialects of Spanish and allow for the immediate identification of a speaker of this dialect? The specific goals of the experiments were to determine the durational differences of the pre-tonic syllable duration relative to other syllables and speakers. For a comparison of this dialect with Buenos Aires Spanish and other Argentine dialects, a nuclear peak contour was measured to examine the timing and height of the peak relative to the tonic syllable. An analysis of the syllable duration was also performed to view how the lengthened pre-tonic syllable was organized within a phrase or utterance.

The next set of goals was aimed at the social meaning indexed by these variables, and the pre-tonic vowel lengthening. More specifically, this dissertation tested different durations of pre-tonic vowels on a sample of Argentine Spanish speakers to determine the effect of a single linguistic variable on the identification of a speaker's dialect. Another objective of these analyses was to probe the influence of listener experience on the perception towards different speakers and dialects, particularly the listener's regional identity and affiliation with the Córdoba dialect.

6.1.2 Some problems in data collection analysis

Data collection for this research involved many steps: recording, recruitment of speakers and listeners, stimuli selection, stimuli manipulation, perception instrument design, acoustic measurements and statistical analyses, as well as the overall design of the experiment employed. There are some details within these different aspects that impaired the outcome of some results. These limitations are acknowledged here and

possible resolutions are suggested so that future studies may benefit from alternate ways of meeting the objectives of this line of research.

The most serious and avoidable problem in the data collection for this research was in the balance of tokens in both the Dialect Identification task. Córdoba speakers and thus Córdoba tokens far outnumbered Buenos Aires and Tucumán tokens which precluded firm conclusions regarding these other dialects. It also created an imbalance in the token presentation to the listeners. Although these tests are meant to challenge listener perception, they are not meant to influence perception in the direction of one dialect or another. This problem could have been avoided by using a balanced number of speakers and tokens from each of the three regions involved.

Several other flaws merit mentioning. In the creation of speaker groups for a perception test, one always faces the possibly problematic reality that there is no single or correct way of defining groups of speakers on a social basis. The speaker groups for this study are often categorized by dialect, which refers to the province each speaker resides in and has lived in for his or her life. Beyond the few experiential traits that were controlled, residing in a certain city does not reduce the other features that make each speaker unique. A great amount of speaker variation was intentionally introduced to the study, to avoid isolating a certain gender or age group in the *tonada cordobesa* study. While this allowed for a more natural illustration of different speakers using spontaneous naturalistic speech, the lack of control for linguistic and speaker traits limited the strength of the analyses. On the other hand, it does not err on providing contrived speech, read speech, or otherwise laboratory style speech in which a single speaker gives controlled linguistic output. Such data are readily analyzed with statistical tests but less clearly interpreted for its application to non-laboratory contexts (i.e., real life situations).

An additional concern of this project relates to the lack of control over the participant listener judges due to the online diffusion of the perception tests. This method allowed the experiments to reach a greater number of Argentine participants over a broad space (across several countries) while reducing the time and financial investment on the part of the researcher. Consequently, the researcher could not control the selection of subjects and relied on their responses to the questionnaire to determine which individuals qualified for inclusion in the study. The procedural aspect was also not controlled by the researcher. Subjects were asked to wear headphones but a question within the questionnaire confirmed that not all subjects wore headphones for the duration of the two perception tests. Therefore, their ability to hear the auditory stimuli may have been compromised by listening to stimuli through computer speakers, masking certain sounds, and/or completing the tests in a loud or distracting environment. However, one benefit of the researcher's absence during the survey was the avoidance of the observer effect. Although the subject was not engaged in speaking or recording in this study, the potential influence of the researcher's language and identity was avoided and subjects most likely performed this test in a familiar environment surrounded by familiar people.

6.2 SUMMARY OF RESULTS

6.2.1 *La tonada cordobesa* and Córdoba identity

Based on the acoustic analysis performed on samples of natural spontaneous speech and the consistent listener responses confirming the identity of speakers of this dialect in short excerpts of speech the Spanish of Córdoba, Argentina definitely qualifies as a *tonada* or accent. Measures of the pre-tonic vowel duration and syllable duration proved significantly longer in the Córdoba speaker tokens compared to Buenos Aires and

Tucumán speaker tokens. The comparison of syllables surrounding the pre-tonic syllable in the same word and expressed as ratios demonstrated patterns unique for each variety; Córdoba tokens showed the longest pre-tonic syllable, but a long pre-pre-tonic syllable, and a much shorter post-tonic syllable. There were relatively smaller differences between syllable durations in tokens from Buenos Aires speakers, while syllable durations from Tucumán speakers were longest in tonic and post-tonic positions.

Analyses of the peak and valley alignment in the nuclear word again revealed different patterns for each of these three dialect groups. Tucumán pitch curves rose the slowest, reached the peak the latest and were most consistently within the tonic syllable. Buenos Aires data displayed a fast rise to an early peak, which varied among these tokens from pre-tonic, tonic and post-tonic alignment. On average there was little latency between the valley and the peak. The curve for Córdoba speakers was the only one in which the valley alignment averaged early or before the onset of the stressed syllable and had combined with an early peak. The results for Tucumán and Buenos Aires intonation confirm the observations of previous studies (see chapter 2 for a full discussion). The intonation of the Córdoba speaker tokens, however, does not fully align with Fontanella de Weinberg's (1971) conclusions, instead showing a pattern of peak and valley alignment that occurs a little later in the lengthened syllable than she had described.

An acoustic analysis of the rhythmic timing of syllables, including the lengthened and stressed syllables found more unexpected results for the *tonada cordobesa*. Duration measures of each syllable in the intonational phrase reveal a pattern of distribution in which the lengthened syllable is timed to fall in the middle of the intonational phrase. Therefore, syllables preceding the nuclear grouping of pre-tonic and tonic syllable are shortened and balanced out durationally by longer pre-tonic and tonic syllables. These

observations are not able to affirm an organizational role of the lengthened pre-tonic syllable but suggest the importance of stress in the rhythmic timing of these syllables.

Manipulating a single linguistic variable associated to the *tonada cordobesa* such as a lengthened pre-tonic vowel resulted in a shift of dialect identification among Argentine listeners in a Dialect Identification task. When this vowel was artificially shortened using Praat voice software for manipulation to a duration, which is only half of that of the original production, listeners were significantly impaired in their ability to correctly identify Córdoba speakers. The opposite manipulation involved lengthening the pre-tonic vowel to double the original duration of speech tokens from Buenos Aires and Tucumán speakers. When all other linguistic features were kept the constant and manipulated tokens were presented along with their naturally produced (unmanipulated) pairs in pseudo-randomized order, the result was an induced perception of a Córdoba identity.

The tokens produced by Buenos Aires speakers were accurately identified at the highest rate for the three dialect groups, 80.6% versus 57.3% for Córdoba speakers. In these two groups the natural tokens were identified significantly better than the manipulated tokens which were 51.8% and 28% respectively. The increased accuracy in the identification of Buenos Aires speakers, in spite of token manipulation and the varied origins of the listeners, shows this dialect to present salient linguistic features that are readily recognized by listeners from all regions of Argentina. Identification of the Tucumán speakers proved the most difficult for listeners. The accuracy for natural and manipulated tokens, 39.3% versus 29.6% was not significantly different indicating that the linguistic features of this dialect are not well known outside of their immediate region. The results of individual listener groups categorized by their region of origin

show a significantly increased accuracy of Tucumán speaker identification by both Tucumán listeners and listeners from neighboring provinces. The results for all speakers substantiate the observation that pre-tonic vowel lengthening is associated to a Córdoba identity and that this cue in isolation is sufficient for influencing the perception of a speaker's dialect.

6.3 CONTRIBUTIONS AND THEORETICAL IMPLICATIONS

This project encompasses several areas that are currently unexplored for the Cordoban dialect of Spanish, or other Spanish dialects including prosody, perception, and dialect variation. It contributes to linguistics in each of these areas with its results and methodologies. The prosodic features of the *tonada cordobesa* are further revealed in this analysis, which finds empirical evidence for the production and the perception of a lengthened pre-tonic vowel and its association to this dialect. The vowel lengthening is 50% to 100% longer than is found in the Buenos Aires and Tucumán speakers recorded for this study; and when artificially added to these speech samples induces perception of a Córdoba speaker despite all other linguistic variables that were being held constant. To the knowledge of the author, the experimental method for testing prosodic duration was not used in any of the dialect identification studies cited in this dissertation or similar types of experimental and perceptual research.

In addition to the vowel lengthening in the *tonada cordobesa*, the results from this dissertation provide evidence that the pitch contour for this dialect may also be unusual for varieties of Spanish, building upon previous research that had relied upon auditory analysis. Even though it was a small set of data, the methodology applied in the acoustic analysis was able to reliably report tonal movement and alignment. Nuclear contours are often perceived auditorily to be more salient and to occur earlier than measures of

fundamental frequency found acoustically (Hualde 2005). For instance, in a standard-like intonational curve for a declarative, a neutral statement peaks and anchors to the tonic syllable. The duration increases as it rises in this syllable and it is perceived to align within it when in fact the peak occurs just after the tonic syllable in the post-tonic (see Hualde 2005). Thus, an impressionistic analysis alone is subject to these perceptual deficiencies and requires non-auditory means of substantiation. In the experiments described here, the tonal peak is to align in the tonic syllable which is later than previously thought.

A final contribution to the prosodic and intonational understanding of the *tonada cordobesa* is provided in this dissertation. A preliminary analysis of the syllable timing in the intonational phrase suggests a pattern that, if confirmed, would have important theoretical implications for our knowledge of Spanish stress and phonology. Instead of providing more phonetic evidence for duration as a cue to stress, this analysis supports the phonological representation of segmental timing. In particular, this finding raises the question whether the durational regularities in the *tonada cordobesa* belong to the internal representation that language users have of how their language should sound. The contributions of the acoustic analysis of the prosody and intonation of the *tonada cordobesa* reach beyond descriptive documentation for another dialect of Spanish and challenge the norms that characterize this language.

The methodological design of using perception results combined with production analysis contributes a different approach for examining acoustical saliency and attitudinal significance for a linguistic variant or set of variants. Language researchers are becoming increasingly aware of the imperative role perception has for any linguistic study. Generally, linguistic production comes first and foremost in the exploration of a new

variant and perception tests may follow as separate studies. These separate studies would use different data, speakers and populations than were previously employed for the production of that same variant. The methodology utilized here unites the two methods of analysis to discover what is acoustically and socially important in the dialect of interest, the *tonada cordobesa*.

6.4 CONCLUSIONS

The region of Córdoba figures significantly within the history and culture of Argentina and its vernacular presents a unique and very recognizable set of linguistic features. A lengthened pre-tonic vowel lends a saliency to the *tonada cordobesa* and is able to cue the perception of the speaker's regional origin among other perceived characteristics. The intonation accompanying this lengthening is also important in the perception and production of this regional variety contributing to the unique sounding rhythm and *cantito* for which it is named.

The *tonada cordobesa*, when compared to other dialect varieties, in particular, those spoken by Buenos Aires and Tucumán residents, exposes a diverse set of prosodic and intonational characteristics. Although this research has focused on a particular dialect, the sociolinguistic situation presented in Córdoba exists throughout the world wherever regional dialects are in contact defining and distinguishing speakers from one another and from the standard dialect. This is a dynamic that influences interpersonal relations on very small and large scales, between two speakers or two nations.

6.5 FUTURE DIRECTIONS OF RESEARCH

There are a number of avenues for future research in the topics presented in this dissertation. First, the attitudes associated with the *tonada cordobesa* are likely to reveal

further social perceptions linking the prosodic features of the dialect to existing stereotypes of the speakers and region. An ongoing investigation by the author (Lang-Rigal 2014) uses speech samples to elicit attitude measures towards Córdoba as well as Buenos Aires and Tucumán speakers. Listener judges rate Córdoba speakers as *gracioso* “funny” but not *culta* “cultured,” while Buenos Aires speakers are more frequently assessed as *serio* “serious” and *culta* “cultured” but are also deemed *egoísta* “selfish,” confirming some popular stereotypes of these regions. These divisions, which also classify Córdoba and Tucumán (but not Buenos Aires speakers) as *pueblerina* “small-town,” further support the division of social status traits between speakers of dominant, more standard varieties and those of non-standard varieties, even though the latter are more positively viewed in terms of integrity and attractiveness traits, and hence covert prestige (Labov et al. 1968; Giles et al. 1982; Preston 1999a). Additional analyses of these data may provide new insights into the language attitudes maintained by Córdoba listeners and listeners from other regions, in particular Buenos Aires. Continued investigation into these two different and distinguishable dialects—especially the perception of, attitudes towards, and social status of each dialect—will inform our understanding of identity and diversity within Argentina, and will further probe the dynamic between dominant and less-dominant varieties.

Additional measures of language attitude, such as a survey directly eliciting attitudes and similar to those of Solé (1987) and Rodriguez-Louro (2013), would benefit from being more inclusive of speakers and dialects outside of Buenos Aires. The website that hosted the dissertation experiment was created to serve these purposes and can be used for the development of future surveys and perception tests shared with a wide, Internet audience.


The attitudes toward the standard language and other language attitudes of Argentine speakers can also be pursued through more indirect methods. A specific idea would employ the matched guise method for the speech tokens used in the language attitudes perception test of this survey. As pre-tonic lengthening was examined in the Dialect Identification task of this dissertation different guises of the same speaker could elicit attitudes towards a specific linguistic feature. A socially marked variant such as the assibilated /r/ or the devoiced and voiced alveopalatal fricatives [ʃ] and [ʒ] would likely induce a change in perception of the speaker's characteristics revealing attitudes towards the perceived dialect in a matched-guise presentation of alternating variants. The challenge in using multiple copies of the same voice and token is avoiding recognition by the listener, thus tokens would have to be very short and the questions regarding the speaker limited. This would provide insight into both the perception of the linguistic cues and their indexical meaning.


Other research directions continue along the path of perception, dialect identification and the indexicality of linguistic variants. Here, the role of vowel lengthening was measured by manipulating duration, but the perception of supra-segmental features can be done by masking techniques that allow for more control of other linguistic variables. For instance, the intonation contour of an auditory stimulus can be removed, leaving behind only phonetic and rhythmic information. This approach, when combined with a matched-guise format similar to the Dialect Identification task, may reduce the identification accuracy of Buenos Aires speakers, as intonation was very likely informing the perception of listeners even when the prosody was altered. An opposite technique removes all segmental information leaving only the intonation with undecipherable speech, and posing the question: is intonation a reliable cue for the

perception of a Córdoba/Buenos Aires/other dialect speaker? Either of these methods would contribute to the findings presented in this dissertation about pre-tonic vowel lengthening. Pre-tonic lengthening is shown to significantly influence perception of a Córdoba dialect when applied to speakers from other provinces and when absent in the speech of Córdoba speakers. The role of intonation was not systematically tested in this research and yet is significant in distinguishing between dialects. Given the unique intonational contours of Buenos Aires Spanish, it can be expected that the Central dialect of Córdoba shares some of these suprasegmental features and is also characterized by a unique intonation that has yet to be discovered.

Appendices

Appendix A. Images of messages for recruiting participants: The first two messages were posted on Facebook, the third is an announcement from a University-wide listserv sharing events will all members of the University of Texas at Austin.



Jennifer Lang Rigal shared a link.
9 hours ago 

A mis queridos amigos Argentinos: necesito su ayuda!!! como saben, estoy estudiando los dialectos argentinos hace unos años, y ahora estoy haciendo el proyecto mas importante para mí - mi tesis doctoral, y si me sale bien me dejarán graduarme, por fin!! Todo el mundo puede participar, se trata de una encuesta en el internet en que escuchás grabaciones de personas de diferentes ciudades de argentina y contestás una preguntas. Toma 30 minutos en total, pero podés tomar pausas cuando quieras. Es bastante interesante, creo yo! y tu participación - además de servir como gran ayuda a mí- ayudará a generar atención y comprensión de la linda variación de lengua, personas, y regiones que uds tienen. Muchísimas gracias a los amigos que ya lo han hecho, y a los amigos de ellos también!! Y como somos todos conectados, lee la ** abajo antes de comenzar, por favor.
Un gran abrazo a todos, (la) Jenny

<http://lablinguistica.com/>

**Si reconocés a una de las personas en las grabaciones, favor de escribir el nombre de él o ella en la sección "Comentarios" al final del estudio, asi puedo eliminar estas respuestas específicas de tus datos. Gracias!

f Argentinos en Austin Q



RECENT POSTS



Jennifer Lang Rigal

Amigos Argentinos: necesito su ayuda!!! Estoy haciendo un estudio sobre los dialectos argentinos para mi tesis doctoral acá en UT. Necesito participantes de origen Argentino, no importa si ya no vivís allá. La encuesta te pide escuchar a unas grabaciones y adivinar de dónde es el hablante. La encuesta está online, solo necesitás internet, unos audífonos y 30 minutos para hacerlo! Tu participación, además de ayudarme a recibirme (por fin!), ayuda a generar atención y comprensión de la variación de lengua y personas que uds tienen en Argentina. Muchísimas gracias por leer, y mil gracias si participás o si pasás el enlace a otras personas.... 😊 saludos, Jennifer <http://lablinguistica.com/>



Lab Linguistica
lablinguistica.com

¿Sabés distinguir un porteño de otro argentino, solo por su acento? ¿Conocés los dialectos regionales de Argentina? ¿Podés reconocer el habla de un cordobés

Like · Comment · Unfollow Post · Share · 8 minutes ago · Edited

What starts here changes the world

Know Events, a service of University Communications, is a gateway to the university community. It provides information to students, faculty, and staff about events and activities taking place at The University of Texas at Austin each day. Information about the following day's events and activities are listed in this e-mail. Submissions must be received by noon, two business days prior to an event.

LISTINGS for Wednesday, Oct. 9

Argentine dialects study seeks participants
 Description: Researchers seek Argentine participants to complete a fun and fast (30 minutes) listening test about dialects in Argentina. You must be an adult and from Argentina to participate. Visit the link below to begin or for more details and contact info. The study is part of dissertation research on linguistic variation in Argentina. All Argentine adults welcome to participate.
 Time: All-day event
 Location: Online
 Admission: Free
 URL: <http://lablinguistica.com/>

Appendix B: Consent and Introduction page on website (Spanish version)

Universidad de Texas en Austin

Facultad de español y portugués

Programa de Doctorado en lingüística del español

Título de investigación: La percepción de dialectos argentinos del español. La percepción de dialectos del español hablado en Argentina.

Sabés distinguir un porteño de otro argentino, solo por su acento? Conocés los dialectos regionales de Argentina? Podés reconocer un cordobés inmediatamente? Este estudio está diseñado con el propósito de probar estas interrogantes. Es parte de mi tesis doctoral*, y estaría muy agradecida de contar con tu participación. Solo se requiere que escuches varias grabaciones cortas, y que contestes unas preguntas, como por ejemplo, ¿esta persona te suena cordobesa? O ¿qué tipo de personalidad tiene esta persona? Hay muchas cosas que podemos adivinar con solo escuchar el acento de una persona, y ese es el tema principal de mi estudio. Si te interesa participar, por favor leé la información siguiente...

1. Para participar en este estudio, debés ser adulto, hablante nativo del español de Argentina y tener una audición normal.

Si tenés problemas de audición, es posible que encuentres este cuestionario demasiado difícil ya que requiere escuchar grabaciones de hablantes argentinos.

2. Para poder participar, vas a necesitar el uso de una computadora con conexión a internet y audífonos. También, debés asegurar que tu entorno sea lo más callado y tranquilo posible, porque vas a tener que escuchar con mucha atención y concentración; sin embargo no tiene respuestas ni “correctas” ni “incorrectas”, todo depende de tu opinión.

3. Te llevará entre 20 a 40 minutos completar el cuestionario, pero podés pararlo para descansar en cualquier momento. Si necesitás tomar una pausa más larga, tenés la opción de guardar tus respuestas y terminarlo en otro momento. En este caso, se te mandará por email un enlace con tu cuestionario incompleto. Solo intenta completarlo todo en el mismo día.

4. Nota importante: Tus respuestas serán anónimas, y además, el estudio no pide ninguna información personal como para identificarte, como por ejemplo, tu nombre. Todos los datos se mantendrán privados y confidenciales por parte de la investigadora.

5. La finalidad de este estudio es investigar como perciben los hablantes del español de Argentina los diferentes dialectos del mismo. Esto me ayudará a determinar cuáles son los factores clave en la percepción de estos dialectos. Tu participación no presenta ningún riesgo ni beneficio conocido. Tu participación es voluntaria. Podés rechazar contestar cualquiera de las preguntas, y tenés el derecho de retirar tu participación en cualquier

momento. El retirarte del estudio no afectará de ninguna manera tu relación con la Universidad de Texas. Si decidís no participar simplemente podés parar el estudio cerrando la ventana en la que está el cuestionario.

*Este estudio es llevado a cabo por Jennifer Lang-Rigal, una candidata de doctorado en lingüística hispana en la Universidad de Texas en Austin, EEUU. Ante cualquiera pregunta, duda, o comentario, podés escribirle al siguiente email: cba.jlang@gmail.com, o podés contactar la oficina de apoyo a la investigación (Office of Research Support), The University of Texas at Austin, P.O. Box 7426, Austin, TX 78713, (512) 471-8871, orsc@uts.cc.utexas.edu.

Si aceptás participar y das tu permiso para usar la información proveída en el cuestionario, por favor hacé clic en el botón “próximo” al final de esta página. Si no, hacé clic en la X para cerrar esta ventana.

Próximo

Appendix C: Consent and Introduction page on website (English version)

University of Texas at Austin

Department of Spanish and Portuguese

Doctorate in Spanish Linguistics

Study: Dialect Perception in Argentine Spanish

Do you know how to distinguish a Buenos Aires native from another Argentine, only by his or her accent? Are you familiar with the regional dialects of Argentina? Can you recognize a Córdoba native immediately? This study is designed purposefully to test these things. It is part of my doctoral dissertation*, and I would be very grateful to have your participation. It only requires that you listen to several short recordings and that you answer some questions, for example, Does this person sound Cordoban to you?, or What kind of personality do you think this person has? There is a lot we can guess by only listening to the accent of someone, and that is the main topic of my study. If you are interested in participating, please read the following information...

1. To participate in this study you must be an adult native speaker of Argentine Spanish with normal hearing.
If you have hearing problems, you may find this survey too difficult as it requires listening to short recordings of Argentine speakers.
2. To be able to participate, you will need the use of a computer with internet connection and headphones. Also, you should make sure that your surroundings are as quiet and calm as possible, because you are going to have to listen very closely and with concentration; nevertheless, there are no “right” or “wrong” answers. It all depends on your judgment.
3. The survey will take between 20 to 40 minutes to complete, but you may stop and rest at any time. If you wish to take a longer break, you may save your answers and continue working on it at another time. A link to your saved survey will be emailed to you. Just try and complete it within the same day.
4. Important note: Your answers will be anonymous, and also, the study does not ask you for your name, or any other personally identifying information. All data is maintained private and confidential by the researcher.

5. The purpose of this study is to investigate the perception of different dialects of Argentine Spanish, by speakers of Argentine Spanish. This will help me determine what phonetic and psycho-social factors are important in dialect perception. Your participation presents no known risks or benefits. Your participation in this study is voluntary. You may decline to answer any question and you have the right to withdraw from participation at any time. Withdrawal will not affect your relationship with The University of Texas in any way. If you do not want to participate either simply stop participating or close the browser window.

*This study is being conducted by Jennifer Lang-Rigal, a doctoral candidate in Spanish Linguistics at the University of Texas at Austin, USA. For any questions or comments, write the researcher at: cba.jlang@gmail.com, or you may contact the Office of Research Support, The University of Texas at Austin, P.O. Box 7426, Austin, TX 78713, (512) 471-8871, orsc@uts.cc.utexas.edu

If you accept to participate and grant your permission to use the information herein provided, please click on the “Next” button at the bottom of this page. If not, click on the X to close and exit this window.

Next

Appendix D. Written questionnaire completed by each subject: this is the exact Spanish text that appears in the online survey.

A. GENERAL

1. Sexo M F

2. En qué año naciste? (drop-down list)

3. Hasta que nivel educativo has completado?

Primaria

Secundaria

Terciario

Universidad (incompleta,o en curso)

Universidad (completa)

Posgrado (Maestría,Doctorado, u otro diploma avanzado)

4. Sos estudiante actualmente? Sí No

- (Si la respuesta de 4 es 'sí') Qué tipo de trabajo hacen tus padres? (eligí una categoría por padre)

Obrero non-especializado

Obrero especializado, p.ej. carpintero

Empleado municipal

Encargado o gerente

Profesional

Desempleado

Estudiante

Jubilado

Ama de casa

- (Si la respuesta es 'no'), Qué tipo de trabajo hacés vos?

Obrero non-especializado

Obrero especializado, p.ej. carpintero

Empleado municipal

Encargado o gerente

Profesional

Desempleado

Estudiante

Jubilado

Ama de casa

B. LUGARES

1. Dónde vivís actualmente? (ciudad)_____ (provincia)_____

2. Te criaste aquí (en donde vivís actualmente)? Sí No

- (Si la respuesta es 'no'), dónde te criaste? (ciudad, provincia) Si has vivido en más de una ciudad, escribí el lugar más importante para vos (con el cual te sentís más identificado)

(ciudad)_____ (provincia)_____

3. Si alguien de otra provincia de Argentina te preguntara de dónde sos, que le dirías? (ciudad)_____ (provincia)_____

4. De dónde es tu madre? (ciudad)_____ (provincia)_____

y tu padre? (ciudad)_____ (provincia)_____

5. Tenés familia que vive en Córdoba (provincia o ciudad)? Sí No

6. Tenés amigos que viven en Córdoba (provincia o ciudad)? Sí No

7. Has visitado alguna vez la provincia de Córdoba? Si No

- (Si la respuesta es 'sí') Cuántas veces? 1-5 5-10 10+

8. Has viajado a otros países de habla hispana? Sí No

- (Si la respuesta es 'sí') Te quedaste más de un mes? Sí No

C. IDIOMA

1. ¿Usaste audífonos durante esta encuesta? Sí No

2. Sos bueno/a para distinguir entre los diferentes dialectos del español (de América Latina) Sí No

3. Normalmente sabés distinguir el origen (regional) de una persona argentina? Sí
No

4. Creés que tu acento se estima favorablemente por personas que vienen de otras regiones de Argentina? Sí No No sé

Y de otros países? Sí No No sé

5. Creés personalmente que tu acento es lindo, en relación a otros acentos del español?

Sí No No sé

(Next Page)

Porcentaje de respuestas correctas:

47%

(No te preocupes si no está muy alto! Hasta ahora el promedio es alrededor de 55%, esta prueba es difícil a propósito:)

Muchísimas gracias por tu participación, y otra vez gracias si compartís esta encuesta con otra persona!! Se apreciará eternamente tu ayuda y apoyo con este proyecto,

Jennifer Lang-Rigal

Por favor dejá cualquier comentario o pregunta aquí

(si querés recibir alguna información, dejáme tu email también):Jennifer Lang-Rigal

Enviar

Toda la información que se escribe aquí, tanto los resultados como cualquier otro dato que se provee en esta encuesta son privados y serán revisados únicamente por la investigadora

Appendix E. English translation of Written Questionnaire text (presented in Spanish as part of the online perception test).

A. BASIC

1. Sex M F

2. Age

3. What is the highest level of schooling you have completed?

Elementary Secondary University (partial) University (licenciatura)
University (Master, Doctorate, or other advanced degree)

4. Are you currently a student? Y N

. (If answer is Y) What jobs do your parents do? (check one for each parent)

. (If answer is N) What job(s) do you have? (check one for each job)

**Transitions: "now we're going to ask a few questions about where you come from"

B. PLACES

1. Where do you live now? (city, province)

2. Did you grow up there? Y N

. (If answer to 2 is N) Where did you grow up? (city, province) (if you've lived in more than 1 place, list them in order of importance to you and your formation).

3. If someone from another province of Argentina were to ask you where you are from, what would you answer? (city, province)

4. Where is your mother from? (city, province) and your father? (city, province)

5. Do you have family that lives in Córdoba? Y N

6. Do you have friends that live in Córdoba? Y N

7. Have you ever visited Córdoba? Y N

a. (If answer to 7 is Y) How many times? 1-5 5-10 10+

8. Have you traveled to other Spanish speaking countries? Y N

a. (If answer to 8 is Y) Did you stay longer than one month? Y N

**The last 4 questions are about language, then you are finished!

C. LANGUAGE

1. Are you good at distinguishing between different dialects of Spanish from other countries? Y N

2. Can you usually tell where someone is from within Argentina? Y N

3. Do you think your accent of Spanish is positively viewed by people a. from outside of your province?

Y N b. from outside of your country? Y N

4. Do you personally think your accent is nice, relative to other accents of Spanish? Y N

Please leave questions or comments here (and if you want me to answer you, leave your email as well):

(All comments and questions, as well as all results and answers you provide are private and will be seen only by the researcher)

Thank you so much for your participation, and thank you again if you share this survey with someone else!! Your help will be eternally appreciated,

Jennifer Lang-Rigal

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