

Orthographic Loyalty in the Spanish of Northern Mexican Speakers

by

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ABSTRACT

This study analyzes the Spanish of native speakers from Northern Mexico in order to ascertain the presence of the voiced labiodental fricative segment [v] when the sound is orthographically represented with the letter 'v'. The study examines some of the internal and external factors that predict the labiodental fricative pronunciation of the letter 'v'. This study is based on the theoretical framework of phonology as described by Piñeros (2009) and Hualde (2005).

The study examined all instances in the data when a sound is written with the letter 'v' to investigate if the sound is pronounced as the faithful voiced plosive bilabial allophone [b] of the phoneme /b/, the spirantized allophone [β], or the voiced labiodental fricative allophone [v]. Four speakers, a male and a female with an incomplete secondary education, and a male and a female with a graduate level education participated in the study. All participants were interviewed for one hour, read a word list, and read a paragraph provided by the researcher.

The researcher coded the data using the phonetic analysis software Praat and all data were statistically analyzed using the multivariate software analysis program Goldvarb X in order to investigate the presence of the voiced labiodental fricative allophone [v] and predict what internal and external factors most influence its production.

From this study it is obvious that the most influential factor favoring the realization of the labiodental fricative allophone [v] is orthography. When the phonetic segment was represented with the grapheme <v>, the phonetic

realization was more likely to be the labiodental fricative [v]. The level of education of the speaker and the formality of the stylistic setting were also determined to be influential factors. Speakers with a higher degree of education and stylistic settings with a higher degree of formality favored the realization of the labiodental fricative [v]. With regards to the internal factors, rather than external factors, a preceding phonological segment of a vowel or fricative dental [s] also favored the realization of the labiodental fricative [v].

DEDICATION

This thesis is dedicated to my grandparents who have always supported me throughout my academic endeavors, and any other adventures I might embark upon.

I also dedicated this thesis to my loving husband, without whose support I never would have made it through graduate school. I hope I can be as wonderful a wife to you as you have been a husband to me. Thanks for being my rock.

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Every American school child knows the importance of spelling. From an early grade, spelling tests and bees where students are placed in front of a crowd to spell a word correctly are part of the young child's academic world. The reason that spelling bees often receive national attention and are described as an intense competition is because often words are not spelled to match the phonetics of their pronunciation. While the Spanish language is more phonemic in its spellings than say French or English, there still exist times when one sound can be represented by multiple letters. For example the voiced velar plosive [g] can be written with the letter <g> if followed by a low mid-vowel but it has to be written 'gu' before the high vowels [i] and [e]. Some sounds have bigger differences, for example the focus of this study, the voiced bilabial plosive /b/. While this phoneme has several variants, which will be discussed later, the sound can only be orthographically represented two ways: with the letter or the letter <v>. Normally this does not influence the pronunciation of the words; *vaso* and *beso* are pronounced [bá.so] and [bé.so], respectively. However, some native speakers will pronounce with distinct sounds the orthographically different letters. In order to distinguish words written with the letter <v> from those written with the letter , the presence of a voiced labiodental fricative has been noted, even though modern Spanish lacks such a phoneme in its phonemic inventory (Hualde, 2005; Lope Blanch, 1988). Hualde (2005) even mentions that teachers in Latin America will stress the pronunciation of a voiced labiodental fricative for words that are written with the letter <v> in order to help students memorize the correct spelling (p. 5).

How does this early conditioning to pronounce the letter and <v> differently, when the standard Spanish pronunciation of both is the same, affect the students' pronunciation once they have left the classroom? Would a person with less education be less likely to produce these distinct pronunciations? This is a phenomenon that has been little explored.

Despite the presence of a voiced labiodental fricative that differs from the prescribed standard, little investigation has been conducted on the phenomenon. Few studies have investigated the presence or pervasiveness of the pronunciation of the letter <v> as the voiced labiodental fricative. To the best of my knowledge, only a handful of studies have been carried out on the topic. The studies range from general overviews to historical linguistics papers, but no variationist studies analyzing the speech of actual native speakers have been done. Even broadening the research to include any studies of the voiced bilabial plosive phoneme /b/ yields few results. More studies must be done in order to ascertain the extent of the presence of the voiced labiodental fricative in Spanish. There are many questions left unanswered by such a lack of research.

This study attempts to fill in some of the gaps in the study of the voiced bilabial plosive phoneme and its orthographic representation in Spanish, specifically the presence of the voiced labiodental fricative variant that can be pronounced when the phoneme /b/ is orthographically represented with the letter 'v'. The northern Mexican dialect, sometimes referred to as Sonoran, was chosen for this study because of the lack of studies on that particular dialect. Although

the Spanish of northern Mexico is quite different from the surrounding areas, “little systematic study of the speech of northern Mexico has been conducted to date” (Curc6, 2007, p. 114). I will begin with an overview of phonological theory on the voiced bilabial plosive phoneme and the voiced labiodental fricative allophone as well as discuss some of the few previous studies that have been done. I will discuss the results arrived at, finally, I will discuss the results of my findings and what implications they have on the study of Spanish sociolinguistics.

REVIEW OF LITERATURE

Theoretical Framework

Phonetics is the study of speech sounds, as a basic definition. Each sound that is produced in a language is represented by a phoneme. Phonemes are the building blocks of a conversation; their realizations strung together in a specific order create recognizable words, which create sentences and so forth. The defining nature of a phoneme is that it is contrastive (Hualde, 2005). This means that if the realization of a phoneme is exchanged with that of another phoneme in an otherwise identical sequence, the meaning of the linguistic unit will change. For example, in Spanish both /g/ and /d/ are phonemes. If the /g/ in *lago* or /l6.go/ is exchanged for /d/, the word changes to *lado* or /l6.do/, which has a completely different meaning, ‘lake’ vs. ‘side’ respectively. The realization of one phoneme cannot be interchanged with the realization of another phoneme without affecting the meaning of the word. A phoneme, however, is a mental unit of the

phonological inventory, it is what the speaker has in their mind; they make a conscious decision to use the /g/ phoneme instead of the /d/ because they want to say 'lake'. What they actually articulate, and what is heard by the listener is the realization of that phoneme. However, sometimes, e.g. when the aforementioned phoneme's articulation is intervocalic, what the speaker actually pronounces is not the faithful realization¹ of the phoneme /g/, which would be the occlusive segment [g], but because of the influence of the surrounding sounds, the realization of the /g/ phoneme will be pronounced more openly as the fricative [ɣ]. The multiple realizations can be referred to as allophones. An allophone is the specific articulation of a specific phoneme (Piñeros, 2009). Allophones can be interchanged in an otherwise identical sequence without changing the meaning of the word. Some allophones have complementary distribution, where the allophone pronounced is conditioned by the surrounding sounds, or a more free distribution (Hualde, 2005). This will be discussed in detail further on.

All consonantal phonemes are articulatorily defined by three characteristics: whether they are voiced or voiceless, meaning whether or not the vocal cords vibrate, their manner of articulation, or the degree of obstruction that is created in their articulation, and place of articulation, or where that obstruction occurs, if there is an obstruction at all (Hualde, 2005, p. 41-42). In this study, the focus is the voiced labiodental fricative [v] and the voiced bilabial plosive [b].

¹ Faithful is used here as defined by Piñeros (2009) where a faithful allophone

The binary allophony of /b/. Plosives are so named for the explosion of air that occurs after the complete occlusion of air inside the oral cavity. The voicedness of the plosives comes from vibrating the vocal cords before that air is released (Hualde, 2005, p. 42). Hualde (2005) focuses his chapter on plosives on their allophonic distribution, although what he gives is a much-generalized overview without considering regional differences. Focusing on the voiced bilabial plosive, the phoneme is so named because during the occlusion phase, the lips never separate, impeding the flow of air. He states that the voiced plosive [b] is found after pauses, after nasals, and that everywhere else it is realized as the approximant allophone [β] (2005, pp. 138). He caveats though, by stating that:

It is important to realize that the complementary distribution between two allophones...is a simplification of reality. What we have is a continuum of phonetic realization where at one extreme we have complete closure and at the other extreme complete deletion of the consonant (Hualde, 2005, p. 145).

The approximant is similar to the voiced plosive in that the vocal cords still vibrate and the place of the occlusion (in this case the lips) is the same, but the occlusion is not complete. Hualde negates that the lack of occlusion could produce a fricative allophone. He states that spectrographic analysis of unfaithful allophones of voiced plosives lack the “aperiodic energy or noise that defines fricative articulation,” (2005, p. 141). This distinguishes Hualde from other phoneticians, such as Piñeros (2009) that consider the phoneme /b/ to have three distinct realizations, which will be discussed later in the next section. Actually, according to Hualde, the more open the pronunciation, the more vowel-like the

allophone becomes (p. 142). He also discusses the influence of the location of the segment within the syllable; when plosives are located in the coda, the contrast between voiced and voiceless is neutralized where the approximant of the voiced is the standard (2005, p. 146). Finally, Hualde describes some regional variation; most relevant to this study is that in some areas of Central America and Colombia “the tendency is to pronounce plosives after all consonants and even glides,” (2005, p. 145).

Hualde’s description of fricative sounds is very general, he only discusses the fricative phonemes, not allophonic variations. He does state the number of fricative phonemes will vary from dialect to dialect (2005, p. 153). Fricatives are so named for the partially impeded flow of air that occurs at the place of articulation. Fricatives are not as strong a consonant as plosive because the air continually escapes from the oral cavity and is never completely stopped (2005, p. 152). Hualde mainly discusses the phonological phenomenon of the phoneme /s/ and /θ/, mainly aspiration and deletion. He only references the voiceless labiodental fricative /f/, and does not mention the voiced labiodental fricative [v] at all.

As Hualde himself states, the biggest flaw in his text is that the guidelines for allophonic distribution are idealized and do not take into account dialectal variation. His guidelines are also very limited in the number of allophones that it presents for each phoneme. This study will also compare his generalized distributions with the data collected from northern Mexican speakers to see if the

distributions will still be accurate when applied to data consisting of recorded speech. It will also look to see if other allophones (like the voiced labiodental fricative) can be found.

The ternary allophony of /b/. Piñeros (2009) disagrees with Hualde on the number of allophones that are associated with the plosive phonemes. Piñeros asserts that both an approximant and a fricative are possible. He states that the lips maintain a slight degree of openness that can vary from almost completely closed, which produces a fricative like vibration of the air, or sufficiently open to not impede the air at all, which results in the approximant allophone (2009, p. 313). He claims that the openness of the previous sound is what most influences the realization of the plosive as an approximant or fricative allophone. Fricatives are more common after a high vowel, where the oral cavity is more closed, while the approximants will occur after a low vowel, where the mouth is more open (2009, p. 313).

Piñeros describes the fricative phonemes in Spanish as limited compared to English. In English there is a voiced and voiceless contrast in addition to the place of articulation of the segment, while Spanish lacks the voiced and voiceless distinction (2009, p. 267). This does not mean that the voiced fricatives do not exist, but merely that they are a product of assimilation of voicing, which will be discussed in the next paragraph. Piñeros does describe the voiced labiodental fricative [v], but as an allophone of the voiceless /f/, not as an allophone of /b/. Piñeros describes the production of the voiceless labiodental fricative /f/ as the

lower lip retracting to touch the edge of the upper teeth, and the pressure of the buildup of air in the oral cavity causing air to escape with force through the small spaces in between the lower lip and upper teeth (2009, p. 270). This pressure is very important so that the air can achieve the required velocity to produce the turbulent sound associated with fricative phonemes. If the vibration of the vocal cords is added to this process of articulation, the voiced labiodental fricative [v] will be pronounced.

With regards to the distribution of the fricative phonemes and allophones, Piñeros states that the onset of the syllable is the most favorable position. The labiodental fricative /f/ is the only fricative in the Spanish language that can form an onset cluster, and only with a liquid (2009, p. 275). However, the labiodental fricative is extremely rare in the coda of a syllable, except for words borrowed from other languages like *afgano*, *chef*, or *rosbif*. It is these instances where the fricative is located in the coda of the syllable that sonorization, or the vibrating of the vocal cords, can occur. When a fricative in the coda is followed by a voiced consonant, the vocal cords will vibrate during the production of the fricative as well (Piñeros 2009, p. 276). Piñeros maintains that there is no contrastive difference between /b/ and /v/, thus the voiced labiodental fricative [v] is an unfaithful allophone of the voiceless labiodental fricative /f/, and not a phoneme (2009, p. 279). Currently, the voiced labiodental fricative [v] is not recognized by any phonetic textbook as a possible allophone of the voiced bilabial /b/.

Piñeros provides excellent descriptions of the various phenomena that affect the voiced plosive, but quantitative research is needed to support his claims. His claims regarding the lack of connection between the voiced labiodental fricative [v] and the voiced bilabial plosive [b] also need to be tested. The results of the current study will be compared with Piñeros' hypotheses to see if they hold true for northern Mexican speech.

Previous Studies

The historical presence of the voiced labiodental phoneme [v]. The voiced labiodental phoneme /v/ is not a sound that recently just appeared in certain Spanish dialects. The sound was a phoneme at one point in Spanish. Martínez-Gil attempts to refute the *Stop-Spirant Contrast Hypothesis* as put forth by Dámaso Alonso (1949, 1962, as cited in Martínez-Gil, 1998), and examines the historic changes in the voiced plosives and their corresponding graphemes (1998). The *Stop-Spirant Contrast Hypothesis* basically states that in Old Spanish, the stop phonemes /b, d, g/ had distinct spirantized versions [β, δ, γ] that were contrastive in the intervocalic position (Martínez-Gil, 1998, p. 284). Dámaso Alonso states that this distinction underlies the medieval *b – u/v* spelling distinction (Martínez-Gil, 1998, p. 285). Martínez-Gil disagrees with this hypothesis, stating that the hypothesis put forth by Amado Alonso is more accurate (1980, p. 285). Amado Alonso's hypothesis is that the spelling distinction actually refers to a difference in bilabial and labiodental pronunciation,

not whether or not the sound is spirantized as Dámaso asserts (Martínez-Gil, 1998, p. 285). Martínez-Gil then supports the hypothesis of a bilabial-labiodental distinction by analyzing the processes of change for the original Latin to modern Spanish plosive phonemes (1998). Both voicing and spirantization occur in similar patterns, typically applied after nuclear vowels and not when preceded by a consonant or glide, word-initially after a pause, or when the stops were originally geminates (1998, p. 287). Martínez-Gil asserts that the presence of spirantization both in Old Spanish and modern Spanish suggests that the hypothesis of Amado Alonso is correct (1998, p. 296).

On the other hand, according to Dámaso Alonso, two allophones, [b] and [β], became contrastive, were represented with different graphemes, and then remerged again centuries later to be two allophones of the same phoneme, /b/, again. Martínez-Gil states that this process would be very unlikely and is not well supported in the case of the other two plosives /d/ and /g/, (1998, p. 294). Martínez-Gil also asserts that there is not enough difference between a stop and a spirant when place of articulation and voicedness are the same to establish auditory distinction (1998, p. 297). The presence of the spelling distinction is much more likely to represent a difference in the place of articulation, as put forth by Amado Alonso (Martínez-Gil, 1998, p. 296). There is also evidence from the end of the 15th century where grammarians are explaining the proper pronunciation of the voiced labiodental [v] (Martínez-Gil, 1998, p. 296). Support for the hypothesis that the graphemes *u/v* represented the labiodental [v] and not

the spirant [β] can be found in Old Spanish when word final plosives were devoiced. In the few cases where the devoicing phenomenon was represented orthographically, the grapheme *u/v* was systematically represented with the grapheme *f* which represented the voiceless labiodental: *nave-naf* ‘boat or ship’ (Martínez-Gil, 1998, p. 301-302). This phenomenon would be difficult to explain if the grapheme *u/v* represented the bilabial [β]. Finally, Martínez-Gil explains the historical processes that the voiced labials were subjugated to from Vulgar Latin to modern Spanish (1998). First, in Gallo- and Hispano-Romance languages, all intervocalic /b/ became /v/, and most labiovelar glides /w/ became /v/ as well (Martínez-Gil, 1998, p. 303). Then, in Hispano-Romance languages, /b/ became /v/ after liquids as well (1998, p. 304). Then, in Early Old Spanish, /v/ began to shift to /b/ word-initially and also after nasals, which is evident in some spelling differences from early documents such as *bivir/vivir* (1998, p. 308). Finally by around the 15th century, the labiodental /v/ had been bilabialized in all contexts (Martínez-Gil, 1998, p. 308). The presence of this historic phonemic distinction between /b/ and /v/ seems to make it possible for the labiodental sound to retain its presence in modern Spanish. Many linguists assert that a sound that has never existed in a language will not appear in said language; change can only occur based on what is possible within the language (Lipski, 1996). The existence (however long ago) of the labiodental makes it possible for it to be retained as an archaism in some dialects in order to reemerge more prominently in modern Spanish dialects. This study will analyze the presence of the labiodental [v] in

modern Spanish to see if it follows the historic phonemic patterns or if new patterns of presence have developed.

Synchronic presence of the voiced labiodental fricative [v]. Taking a historic phoneme and analyzing its presence in modern language is the focus of Lope Blanch's investigation into the labiodental [v] in Mexican Spanish (1988). He compares the old phoneme /v/ with the modern fricative labiodental [v] in order to ascertain if the occurrence of [v] is a vestige of sixteenth century Spanish or an all new phenomenon (1988, p.159). According to him, there was a labiodental phoneme /v/ that was present in Spanish until almost the seventeenth century, and that was maintained much longer in the American colonies than in Spain itself (1988, p. 153). Lope Blanch asserts that the labiodental phoneme /v/ never completely disappeared in some varieties of Northern Mexican Spanish (1988, p. 155). This allowed for the phoneme to emerge more frequently in the formal speech of politicians and radio hosts (1988, p. 155). Lope Blanch discredits the possible theories that it is the result of influence from either Nahuatl or another language, like English. He states that the phenomenon occurs in areas where a second language is not commonly spoken, and that since Nahuatl does not have the /v/ sound, influence from either language cannot be the exclusive reason for the phenomenon (Lope Blanch, 1988, p.160-162). As previously stated, he believes that the labiodental phoneme /v/ never completely disappeared from Spanish; in areas like California, southern Arizona, and northern Mexico, vestiges of the phoneme were maintained in formal and emphatic speech (1988, p. 155). If

this is the case, then the existence of the labiodental [v] is an archaism that has resurfaced and not a new phenomenon originating from English or Nahuatl influence. For his data, Lope Blanch analyzes the public speech of politicians and radio talk show hosts across Mexico. His hypothesis is that the allophone occurs in order to show the “knowledge of good spelling” of the speaker (1988, p.159). The speakers wanted to prove that they had an education, so they pronounced the fricative [v] when the voiced bilabial plosive phoneme was written with the letter <v>. Lope Blanch describes this variation as a phenomenon of hypercorrection, in which the speaker wants to conform to correct orthography and therefore uses a sound that does not exist as a contrastive phoneme in Spanish in order to stress the orthographical differences (and their knowledge of such differences) between sounds (Lope Blanch, 1988, p.159). Lope Blanch cites the fact that the speakers produced the fricative labiodental at a much higher frequency when reading off of a teleprompter as evidence that the phenomenon is orthographically influenced (1988, p.165). Lope Blanch also states that because the switch to the fricative from the plosive is so constant with the spelling of the word in which the sound appears, the fricative labiodental [v] is actually a phoneme in Mexican Spanish (1988, p.163). He prevaricates, however, by emphasizing that the phenomenon only occurs in formal context (1988, p.168). His final conclusion is that in formal or emphatic speech, the voiced plosive bilabial /b/ is almost exclusively realized as the fricative labiodental [v] when represented orthographically by the letter ‘v’ (Lope Blanch, 1988, p.169). While Lope Blanch states that the phenomenon only

occurs in formal speech, he does not cite examples or specific research to support these claims. The current study will further Lope Blanch's study by employing three different contexts of varying formality in which to test his assumptions.

Francisco Moreno Fernández agrees with Lope Blanch regarding the conservation of the labiodental sound [v] in the Spanish of the United States (and possibly Mexico). In his book "Historia social de las lenguas de España" (2005) he talks about US Spanish and the abundant archaisms that can be found in that dialect. He states that the Spanish of Texas has elements that were imported from Central Mexico around the time that Mexico gained independence from Spain (2005, p. 191). Specifically among these maintained archaisms he mentions the conservation of the labiodental [v]. However, Moreno Fernández, in contrast with Lope Blanch, states that the pronunciation of the labiodental [v] in place of the standard approximant [β] is conditioned, not by orthography, but by word frequency (p. 192). He states that high frequency words with the labiodental fricative [v] are evidence that the sound is an archaism that has resurfaced (p. 192). Spanish speakers learn the word as a whole piece, and not as a compilation of individual sounds, so archaisms in the language tend to be maintained (p. 193). He also states that the pronunciation of the labiodental [v] is more common in older speakers (p. 192). While this study does not refer to the northern Mexico dialect specifically, the proximity of the states studied as well as the similarities in the phenomenon studied make it applicable for comparison. This study will

attempt to provide statistical data that could refute or support the general claims made by Moreno Fernández for the specific case of the Northern Mexican variety.

In agreement with Moreno Fernández, Torres & Ferreira state that word frequency is the best predictor of the pronunciation of the labiodental [v] (2000). Torres & Ferreira examined the Spanish of 18 speakers from northern New Mexico, ages ranging from 18 to over 60. The speakers also had a varying degree of formal Spanish instruction (Torres & Ferreira, 2000, p. 7). They tested two hypotheses to see if the presence of the labiodental [v] was an archaism from Old Spanish, or influence from English language contact (Torres & Ferreira, 2000, p. 4). If the labiodental [v] was an archaism, they expected to find it more commonly produced in older speakers. If the labiodental [v] was an influence from English-language contact, they expected to find it more in younger and less proficient speakers (Torres & Ferreira, 2000, p. 3). They also tested English-Spanish cognates to see if the labiodental [v] in New Mexican Spanish was an example of English influence. Torres & Ferreira state that word frequency is the best indicator of whether or not the labiodental [v] is an archaism or not since words with higher frequency retain old language characteristics more than low frequency words (2000, p. 4). High frequency words become ingrained a speaker's mind as a unit, and not as a conjunction of morphemes and phonemes, while low frequency words are analyzed more by the speaker when they are employed (Torres & Ferreira, 2000, p. 4). Thus, language change happens first in low frequency words and then gradually, begins to affect higher frequency words. Torres & Ferreira

used a list of 48 words, cognates, non-cognates, high frequency, and low frequency words that were written with either *b* or *v*. They used videos of the speakers and judged the movements of the speakers' mouths in order to classify a sound as either labiodental or bilabial (Torres & Ferreira, 2000, p. 5). Their conclusions support both theories, the New Mexican labiodental [v] is both an archaism and a result of English influence (2000, p. 14). They found that younger speakers were the least likely to pronounce a labiodental overall, which contradicts the theory that the labiodental comes from English, and supports the theory that the labiodental is an archaism from Old Spanish (Torres & Ferreira, p. 7). However, in the case of cognates and word frequency, lower frequency words and English cognates written with the letter *v* were more likely to be realized as a labiodental, which supports the theory that the labiodental [v] is a result of English influence (Torres & Ferreira, 2000, p. 11). They also found that speakers with high levels of instruction in Spanish were less likely to produce the labiodental; while this logically coincides with the fact that formally, in Standard Spanish, the labiodental is disfavored, it contradicts with what Lope Blanch (1988) found. Torres & Ferreira conclude that the labiodental is both an archaism and a result of language contact (2000, p. 12). In the case of high frequency words, the labiodental [v] is the same labiodental [v] that was present in Old Spanish. This is supported by the use of other common archaisms such as *vide* and *sabore*, as well as declarations from the speakers that the words where they used the labiodental were ones that were taught to them by their grandmothers (Torres &

Ferreira, 2000, p. 11). When the labiodental is used in low frequency words and English cognates, then the labiodental [v] is the labiodental [v] from English (Torres & Ferreria, 2000, p. 13). Torres & Ferreira have made some interesting findings, that the labiodental [v] can be both an archaism and a result of language contact, which merits further study. Their study was broad, covering a range of ages, educations, and genders. Their results were more often than not, insignificant statistically due to lack of tokens in a particular factor group. The present study will narrow the extra-linguistic factors to create more tokens for each factor group so that more statistically significant data can be found. Also Torres & Ferreira only used a word list to ascertain their data, the present study will include three types of data collection to see if the patterns presented in simple word lists are maintained at the paragraph and discourse levels.

Mexico and the United States are not the only countries with native Spanish speakers where the voiced labiodental [v] can be found. Isbasescu (1970) found that the labiodental [v] was also prevalent in Cuban Spanish. She begins by describing the process by which the voiced labiodental /v/ lost its contrast with the voiced bilabial /b/ in Old Spanish. She states that it was in the intervocalic position where the bilabial /b/ was often pronounced as the bilabial approximant allophone [β], which is more similar in pronunciation to the labiodental fricative [v], that the two phonemes first lost their phonetic distinction (Isbasescu, 1970, p. 474). However, Isbasescu states the distinction was not lost in all dialects. Especially in southern Spanish dialects like *sevillano* the distinction went well

through the 18th century. The distinction was not maintained in normal speech, but instead in the speech of people who were influenced by orthography or who had a propensity for affected speech (Isbasescu, 1970, p. 475). In order to investigate the prevalence of the labiodental [v] in modern Spanish, in 1964 Isbasescu did a survey of Cuban youth. She found that the labiodental [v] did appear and generally corresponded orthographically with the grapheme *v*, which would indicate the intent to phonetically maintain the distinction between the grapheme and <v>. However, the labiodental [v] was also found when the corresponding grapheme was *b* (Isbasescu, 1970, p. 476). She concludes that the attempt of the speakers to maintain a phonetic distinction between the two graphemes results in confusion and hypercorrection where either phoneme can be found in any context (Isbasescu, 1970, p. 476). This would make the voiced labiodental fricative [v] an unfaithful allophone of the bilabial phoneme /b/ in Cuban Spanish. This study will look at the Spanish of northern Mexicans to see if they exhibit the same trends that Isbasescu found in Cuba.

Dalbor (1980) stresses the importance of continuing to look for new data and reinterpret old data in his article on the antiquated preconceptions of Spanish phonology. He states that new phenomena are often not recognized or accepted because they differ from the norm (Dalbor, 1980, p. 12). By ignoring new phenomena or believing that the researcher “didn’t hear what they thought they did”, or the speaker “didn’t really mean to say that”, important changes can be overlooked. Dalbor points out the presence of the voiced labiodental [v] as an

occurrence in all dialects of Spanish as one thing that is consistently ignored (Dalbor, 1980, p. 12). This study will follow Dalbor's lead and not ignore the presence of the voiced labiodental, but instead will investigate the prevalence of its realization and the factors that influence its production.

Justification

As previously mentioned, this study aims at filling the holes left by both the lack of research on the northern Mexican dialect in general and the contrast between the voiced labiodental /v/ and the voiced bilabial /b/ and their distribution in Spanish dialects. This study will also add detailed data to complement the general phonological overviews that are present in textbooks. This study focuses on northern Mexican adults' pronunciation of the voiced plosive phoneme /b/ specifically focusing on the prevalence of the voiced labiodental fricative [v] when the corresponding grapheme is <v>.

Research Questions

This study aims at answering the following questions:

1. What (if any) internal factors favor the production of the voiced labiodental [v]?
2. Does the level of education of the speaker affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?

3. Does gender affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?
4. Does the stylistic setting affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?

METHODOLOGY

Participants

Four speakers from Northern Mexico participated in this study; specifically all participants were from the Chihuahua or Sonora regions, two males and two females. Participants were asked personally by the researcher to participate. The remaining two participants were contacted at their places of work and asked to participate in the study. One female has a Bachelor's degree (or *licenciatura*) that was obtained in Mexico, and one male has a Bachelor's degree obtained in Mexico and a Master's obtained in Arizona; these participants will be referred to as 'educated' speakers. The female is currently a graduate student working on obtaining her Master's. The male speaker is an engineer for a government contracted research and development firm. The remaining male and female both have a high school diploma (or *bachillerato*), also obtained in Mexico; these speakers will be referred to as 'non-educated' speakers². The non-educated female speaker is a maid for private homes and various businesses. The

² 'Non-educated' in this study will be taken to mean only that the participants lack a college education.

non-educated male speaker loads the professional contractor's trucks at Home Depot. The speakers fall within an age range of 27 to 37 years old. Their time in the United States ranges from 5-15 years, however, all speakers consider themselves to be more proficient in Spanish than in English.

Instruments

All the subjects in this study participated in three tasks: they read a list of words, then a paragraph, and finally they participated in an hour-long interview with the researcher.³ The tasks are ordered so that they progress from the most formal (a word list) to the least formal, which is the interview. While an interview is not as informal as natural speech, it does allow for a change in formality from the formality of reading and represents the best natural speech that can be obtained when a participant knows that they are being studied. The interview followed a semi-structured format using a pre-designed set of questions. The question set was designed using Labov's conversational modules as described in Tagliamonte (2006). Labov's model calls for basic, demographic information to be asked at the beginning, and then as the interview progresses, for the interviewer to ask more personal questions. I let the subject steer the conversation, if they chose to begin a line of discussion that was not in the pre-designed module, the interviewer changed topics.

³ The word list, paragraph lists and guided questions can be found in Appendix B.

All data were recorded using a Berkin microphone that attaches to an iPod. The inconspicuous size of the microphone allows for participants to speak more freely. The data were then transferred as MP3 files to the researcher's computer. The interviews and readings all took place in common meeting areas such as coffee houses or restaurants.

Data Analysis

I transcribed all data and highlighted each instance of the voiced bilabial phoneme /b/. Tagliamonte (2006) recommends reducing high-frequency tokens to only five per speaker per hour. All words that contain one or more tokens were tallied and once there were five tokens, further occurrences of the word were excluded from analysis.⁴ I then coded the remaining data according to the internal factors such as allophone variants (voiced labiodental fricative, voiced bilabial plosive, or voiced bilabial approximant), part of syllable (onset, onset cluster or coda), preceding sound (lateral, nasal, /s/, other consonant, high vowel, low vowel, mid vowel, or pause), following sound (consonant, high vowel, mid vowel, low vowel or pause), whether or not the sound occurred intervocalically, and the external factors orthographic representation, gender, level of education, and formality (word list, paragraph reading, interview).

The Praat phonetic software program was used to code the voiced bilabial plosive /b/ as one of the allophone variants. Instances where the voiced bilabial

⁴ See Appendix C for the word frequency charts for each speaker.

phoneme /b/ was omitted or aspirated were removed from the data set. The spectrographs resulting from the Praat analysis were compared with spectrographs in Hualde's (2005) text to verify their classification as the voiced bilabial plosive allophone [b], the voiced bilabial approximant [β], or the voiced labiodental fricative [v].⁵

All data were then run through the multivariate analysis program Goldvarb X in order to ascertain which factors would best predict the realization of the voiced bilabial plosive phoneme /b/ as the voiced labiodental fricative [v]. The data were first analyzed in their entirety, including all internal and external factors; this data set will be referred to as the 'global analysis'. After an initial run of the global data set all six instances of the syllable final phoneme /b/ before a pause were removed from analysis due to knockouts⁶.

The data were then separated into four distinct analyses according to external factors (educated, non-educated, female, and male speakers), and were analyzed individually to determine what factors might predict the pronunciation of the voiced labiodental fricative among those specific groups of speakers.

In the educated speaker data group, the voiced labiodental fricative allophone [v] never occurred in an onset cluster, so the factor group 'part of syllable' was recoded, and the onset cluster tokens were combined with the onset tokens.

⁵ See Appendix D for examples of the spectrographs resulting from the Praat Analysis.

⁶ 100% or 0% occurrence of a variant in a factor group

In the non-educated speaker analysis, there was only one token of a voiced bilabial plosive /b/ in the coda of a syllable so it was removed from the data set so the ‘part of syllable’ factor group included only simple onset and onset cluster tokens. After the first run, five tokens were removed from the data set due to knockouts in the ‘preceding sound’ factor group. In the instances where the preceding sound was a constant that was not /s/, a lateral or a nasal, the phoneme /b/ was never realized as the voiced labiodental fricative [v].

In the analysis of the female speakers, the whole factor group ‘part of syllable’ was excluded due to knockouts in the onset cluster variable and a singleton⁷ in the coda variable. Recoding and/or combining factors would have left only one variable in the factor group, so the entire group was eliminated from the data set.

The initial run of data set for the analysis of male speakers did not contain any knockouts or singletons, so no recoding was required.

RESULTS

Global Analysis

The phoneme /b/ was most commonly realized as the voiced bilabial plosive allophone [b], the voiced bilabial approximant allophone [β], or the voiced labiodental fricative allophone [v].⁸

⁷ A single instance of a variable in a factor group.

⁸ There were instances of deletion and aspiration but there were very few cases and all were eliminated from data analysis due to knockouts.

1. Plosive:

- a. [b]ueno. Good.
- b. con[b]alecencia convalescence
- c. ...el [b]achillerato... ...high school diploma...

2. Approximant:

- a. me [β]oy... ... I go...
- b. a[β]solutamente... absolutely
- c. ...esta[β]a... ...it was...

3. Labiodental fricative:

- a. ...uni[v]ersidad... ...university...
- b. tele[v]isión television
- c. Profesor [v]ector Professor Vector

The labiodental fricative was present in 429 of the 1460 tokens, or 29% of the time. From simple observation, high frequency words such as ‘ver’, ‘novio’, ‘vez’, and ‘vivir’ were more likely to be pronounced with the labiodental fricative [v].

The results of the multivariate analysis can be found in Table 1.

Table 1
Global Analysis

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Global Analysis			
Corrected Mean			0.89
Log Likelihood			-464.434
Total N			1460
	Factor weight	%	N
Orthographically Represented with 'v'			
Yes	0.92	58	422
No	0.07	1	7
<i>Range</i>	85		
Preceding Phonological Segment			
Mid-vowel	0.63	49	172
Low vowel	0.62	23	112
/s/	0.60	36	29
Consonant (other than /s/, nasals and laterals)	0.48	30	3
High vowel	0.39	27	69
Pause	0.25	22	20
Lateral	0.23	22	18
Nasal	0.20	5	6
<i>Range</i>	42		
Education			
College educated	0.61	37	288
Not college educated	0.37	20	141
<i>Range</i>	24		
Following Phonological Segment			
High vowel	0.59	37	162
Mid-vowel	0.54	41	211
Consonant	0.42	1	2
Low vowel	0.36	14	54
<i>Range</i>	23		
Context			
Paragraph reading	0.65	35	46
Word list	0.49	31	39
Interview	0.48	28	344
<i>Range</i>	17		

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Global Analysis			
Placement in Syllable			
Coda	[0.75]	20	1
Onset	[0.50]	32	427
Onset cluster	[0.47]	1	1
Gender			
Male	[0.52]	29	246
Female	[0.46]	28	183
Intervocalic			
Yes	[0.57]	36	351
No	[0.36]	15	78

The factors that were deemed significant in the pronunciation of the bilabial phoneme /b/ as the voiced labiodental allophone [v] were whether or not it was orthographically represented with the letter ‘v’, the preceding phonological segment, the education level of the speaker, the following phonological segment, and the context. The most influential factor was whether or not the sound was orthographically represented with the letter ‘v’, 58% of the time when the segment was represented with the letter ‘v’, the segment was pronounced with the voiced labiodental fricative allophone [v]. However if the segment was orthographically represented with the letter ‘b’, then the voiced labiodental fricative allophone [v] was produced only 1% of the time. The preceding phonological segment was also deemed to predict the realization of the phoneme /b/ as the allophone [v], with a mid-vowel, low vowel, and the phoneme /s/ all favoring the production of the labiodental allophone [v]. In the case of the mid-vowel and low vowel, the labiodental fricative [v] was realized in 49% and 23%

respectively, where as in the least influential variable (a nasal), the labiodental fricative was realized in only 5% of the tokens. The education level of the speaker was also significant in predicting the realization of the phoneme /b/ as the labiodental fricative allophone [v], with educated speakers favoring the labiodental allophone while the non-educated speakers do not. The educated speakers used the labiodental fricative [v] 37% of the time, while the non-educated speakers used the allophone [v] only 20% of the time. When a high or mid-vowel followed the segment, the labiodental fricative was realized 37% and 41% of the time, respectively, which is significant. The last factor that was deemed to predict the realization of the bilabial phoneme /b/ as the labiodental fricative allophone [v] was the context. The paragraph reading was determined to favor production of the labiodental allophone, with the segment being pronounced as [v] 35% of the time. This is different than what might be expected since the paragraph is not the more formal context or the most informal context, however the paragraph did contain many of the high frequency words mentioned previously, 'vez', 'novios' and 'verdad', for example, which could account for the higher number of instances of the voiced labiodental fricative.

Educated Speaker Analysis

In the global analysis, education was determined to be one of the factors that influenced the realization of the bilabial phoneme /b/ as the labiodental phoneme [v]. When the speech of the educated speakers is analyzed separately

from the other speakers, it is possible to determine what factors influence their speech specifically. Educated speakers tended to use the labiodental fricative more overall, 37% of the time. The results from the multivariate analysis can be found in Table 2. Again whether or not the phonological segment was orthographically represented with the letter ‘v’ was the most influential factor in the realization of the labiodental fricative allophone [v]. In the case of the educated speakers, orthography was more important than in the global analysis. When the segment was orthographically represented with a ‘v’, the educated speakers produced the labiodental fricative 69% of the time. This is in stark contrast to when the segment was orthographically represented with a ‘b’, in which the labiodental fricative was produced less than 1% of the time. Again the preceding phonological segment was also influential, with a consonant other than a lateral, nasal or the phoneme /s/ being the most predicative.⁹ As with the global analysis, mid-vowel, low vowel, and /s/ preceding phonological segments were also determined to favor the realization of the labiodental fricative [v]. The following phonological segment was significant in the prediction of the realization of the bilabial phoneme /b/ as the labiodental fricative [v], with the high and mid-vowel both favoring production of the allophone [v]. When the following phonological segment was a high or mid-vowel the allophone [v] was realized in approximately 50% of the time. For the educated speakers the context was more influential, with both the paragraph reading and the word list favoring

⁹ There were very few tokens that were classified with a preceding consonant other than a lateral, /s/ or nasal so the statistics could be skewed here.

realization of the phoneme /b/ as the labiodental fricative allophone [v]. In 50% of the tokens from the word list the segment was realized as the allophone [v] and in 43% of the tokens from the reading. For the educated speakers gender was also a significant predictor of the realization of the labiodental fricative allophone, with males favoring its production slightly more than females, 42% versus 32%.

Table 2
Educated Speakers Analysis

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Educated Speakers Analysis			
Corrected Mean			0.10
Log Likelihood			-231.670
Total N			767
	Factor weight	%	N
Orthographically Represented with 'v'			
Yes	0.94	69	289
No	0.03	1	2
<i>Range</i>	<i>91</i>		
Preceding Phonological Segment			
Consonant (other than /s/, nasals and laterals)	0.88	60	3
/s/	0.71	44	20
Mid-vowel	0.62	61	113
Low vowel	0.58	26	65
Lateral	0.42	34	16
High Vowel	0.38	34	53
Pause	0.19	41	15
Nasal	0.14	5	3
<i>Range</i>	<i>73</i>		
Following Phonological Segment			
High vowel	0.67	50	125
Mid-vowel	0.50	49	135
Consonant	0.40	1	1
Low vowel	0.28	16	27
<i>Range</i>	<i>39</i>		

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Educated Speakers Analysis			
Context			
Paragraph reading	0.78	43	28
Word list	0.73	50	31
Interview	0.44	35	229
<i>Range</i>	<i>34</i>		
Gender			
Male	0.57	42	168
Female	0.42	32	120
<i>Range</i>	<i>15</i>		
Placement in Syllable			
Coda	[0.60]	25	1
Onset	[0.49]	37	287
Intervocalic			
Yes	[0.55]	44	229
No	[0.38]	23	59

Non-educated Speaker Analysis

As with the previous two analyses the more influential factor here is whether or not the phonological segment was orthographically represented with the letter ‘v’, but when the segment was represented with the letter ‘v’ it was realized as the labiodental fricative only 43% of the time, less than both the global analysis and the educated speaker analysis. Overall the non-educated speaker used the voiced labiodental fricative allophone [v] 20% of the time. Besides orthographic representation, only the preceding phonological segment and whether the segment was intervocalic or not were deemed significant according to the multivariate analysis. The results of the multivariate analysis can be found in Table 3. As with the global analysis, a preceding /s/ phoneme, mid-vowel or low

vowel favored the realization of the bilabial phoneme /b/ as the labiodental fricative allophone [v], although a preceding consonant that was not the phoneme /s/, a lateral or nasal did not favor its realization. The most influential factor was the /s/ phoneme with the labiodental fricative being realized 25% of the time. In the case of the mid-vowel, when it preceded the phonological segment, the segment was realized as the fricative allophone [v] 37% of the time, and when the low vowel preceded the segment, the allophone [v] was realized 19% of the time. Finally whether or not the segment was intervocalic was determined to be influential with a labiodental fricative [v] being realized in 27% of the cases where the phonological segment was intervocalic. However, since it has already been established that orthography is the most influential factor, and in the Spanish language an onset cluster would never be formed with the letter ‘v’ and another consonant, this could be due to the fact that a bilabial phoneme /b/ followed by a consonant in an onset cluster would rarely be pronounced as the voiced labiodental fricative allophone [v].

Table 3
Non-educated Speakers Analysis

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Non-educated Speakers Analysis			
Corrected Mean			0.06
Log Likelihood			-208.520
Total N			687
	Factor weight	%	N
Orthographically Represented with 'v'			
Yes	0.91	43	136
No	0.12	1	5
<i>Range</i>	79		
Preceding Phonological Segment			
/s/	0.75	25	9
Low vowel	0.58	19	47
Mid-vowel	0.52	37	59
Nasal	0.49	4	3
High vowel	0.35	16	16
Pause	0.35	9	5
Lateral	0.20	5	2
<i>Range</i>	55		
Intervocalic			
Yes	0.63	27	122
No	0.27	7	19
<i>Range</i>	36		
Following Phonological Segment			
Consonant	[0.75]	1	1
Mid-vowel	[0.54]	33	76
High vowel	[0.46]	20	37
Low vowel	[0.38]	13	27
Context			
Paragraph reading	[0.58]	27	18
Interview	[0.50]	20	115
Word list	[0.35]	13	8
Placement in Syllable			
Onset cluster	[0.75]	1	1
Onset	[0.46]	23	140
Gender			

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Non-educated Speakers Analysis			
Female	[0.53]	24	63
Male	[0.47]	18	78

Female Speaker Analysis

The majority of the factor groups analyzed for the female speakers were determined to be predicative according to the multivariate analysis, the results of which can be found in Table 4, the only factor group that was not statistically significant was whether or not the segment was intervocalic. As with all previous analyses, the most influential factor is the orthography of the phonological segment. In the case of the female speakers, when the phonological segment was orthographically represented with the letter ‘v’, they realized the bilabial phoneme /b/ as the labiodental fricative allophone [v] 56% of the time, more than in the global analysis and in the non-educated speakers analysis. The next most influential factor was the preceding phonological segment, with a preceding mid-vowel, /s/ phoneme, low vowel and high vowel all favoring the labiodental fricative allophone [v]. If the preceding segment was a mid-vowel, the allophone [v] was realized 47% of the time, whereas if the segment was a nasal, the allophone [v] was produced only 2% of the time. Looking at the context factor group, the paragraph reading strongly favored the realization of the labiodental fricative allophone [v], the word list also favored its realization, while the interview did not. In the paragraph reading, the allophone [v] was realized 40% of

the time in comparison with the interview where it was realized 27% of the time. In the following phonological segment factor group, only the high vowel was determined to favor the realization of the labiodental fricative allophone [v], with it being produced 40% of the time. Lastly, education level was also a significant indicator of the realization of the voiced labiodental fricative [v], with the educated speaker favoring the production of the allophone, realizing it 32% of the time.

Table 4
Female Speakers Analysis

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Female Speakers Analysis			
Corrected Mean			0.06
Log Likelihood			-197.622
Total N			635
	Factor weight	%	N
Orthographically Represented with 'v'			
Yes	0.94	56	181
No	0.05	1	2
<i>Range</i>	89		
Preceding Phonological Segment			
Mid-vowel	0.65	47	80
/s/	0.64	30	10
Low vowel	0.61	24	46
High vowel	0.52	26	30
Consonant (other than /s/, nasals and laterals)	0.43	20	1
Lateral	0.29	24	9
Pause	0.13	15	6
Nasal	0.06	2	1
<i>Range</i>	52		
Context			

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Female Speakers Analysis			
Paragraph reading	0.81	40	27
Word list	0.55	29	18
Interview	0.44	27	138
<i>Range</i>	37		
Following Phonological Segment			
High vowel	0.64	40	69
Mid-vowel	0.49	34	85
Consonant	0.40	1	1
Low vowel	0.38	19	28
<i>Range</i>	26		
Education			
College educated	0.56	32	120
Not college educated	0.41	24	63
<i>Range</i>	15		
Intervocalic			
Yes	[0.59]	37	155
No	[0.33]	12	28

Male Speaker Analysis

The final analysis run examined only the male speakers. Overall the male speakers produced the voiced labiodental fricative [v] 29% of the time. The results of the multivariate analysis can be found in Table 5. The most influential factor, again, was whether or not the phonological segment was orthographically represented with the letter ‘v’. When the segment was represented with the letter ‘v’, the labiodental allophone [v] 59% of the time. The preceding phonological segment was also significantly influential, with the low vowel, mid-vowel and preceding /s/ phoneme all favoring the realization of the /b/ phoneme as the labiodental fricative allophone [v]. A preceding low vowel most favored the

realization of the labiodental allophone; with it being realized 22% of the time. As with the female speakers analysis and global analysis, education level was also a predicative factor in the realization of the labiodental allophone [v], with the educated speaker producing the sound 42% of the time in comparison with the non-educated speaker who only produced the sound 18% of the time. The following phonological segment was the last factor group to be considered significant in the prediction of the realization of the bilabial phoneme /b/ as the labiodental fricative allophone [v], with the mid-vowel and high vowel both favoring and low vowel and consonant disfavoring its production. The labiodental fricative allophone [v] was realized in 48% of the cases where the following phonological segment was a mid-vowel.

Table 5
Male Speakers Analysis

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Male Speakers Analysis			
Corrected Mean			0.09
Log Likelihood			-252.292
Total N			825
	Factor weight	%	N
Orthographically Represented with 'v'			
Yes	0.92	59	241
No	0.08	1	5
<i>Range</i>	<i>84</i>		
Preceding Phonological Segment			
Low vowel	0.64	22	66
Mid-vowel	0.61	52	92
/s/	0.58	40	19
Consonant (other than /s/, nasals and laterals)	0.45	40	2
Pause	0.32	28	14

Multivariate analyses of the contribution of factors selected as significant to the probability of the phonemes being realized as the labiodental [v]; factor groups selected as not significant in brackets.			
Male Speakers Analysis			
Nasal	0.30	7	5
High vowel	0.29	29	39
Lateral	0.18	20	9
<i>Range</i>	46		
Education			
College educated	0.68	42	168
Not college educated	0.33	18	78
<i>Range</i>	35		
Following Phonological Segment			
Mid-vowel	0.57	48	126
High vowel	0.55	36	93
Consonant	0.49	1	1
Low vowel	0.35	11	88
<i>Range</i>	22		
Context			
Interview	[0.50]	29	206
Word list	[0.48]	33	21
Paragraph reading	[0.48]	29	19
Placement in Syllable			
Onset cluster	[0.94]	1	1
Coda	[0.89]	25	1
Onset	[0.42]	32	244
Intervocalic			
Yes	[0.58]	35	196
No	[0.34]	17	50

DISCUSSION

The purpose of the study was to investigate the presence of the voiced labiodental fricative allophone [v] in the Spanish of Northern Mexican Speakers and examine the internal and external factors that influenced its production. The most constant influential factor groups across all analyses were orthographic representation and preceding phonological segment. The fact that orthographic

representation had such a high influence on the realization of the voiced bilabial plosive phoneme /b/ as the voiced labiodental fricative supports the previous research done by Martinez-Gil (1998) and Lope Blanch (1988) that the orthography of the phonological segment is what determines whether the segment will be realized as the bilabial [b] or labiodental [v]. Since the grapheme was so rarely represented with the labiodental [v], these findings also support Lope Blanch's theory that in the mind of Northern Mexican Spanish speakers, the voiced labiodental fricative [v] is a phoneme and not an unfaithful allophone of the voiced bilabial plosive /b/. For Lope Blanch (1988), as a consequence of extensive formal education, speakers in Northern Mexico developed a phonemic distinction between the voiced labiodental fricative /v/ and the voiced bilabial plosive /b/. However this study shows that the realization of the fricative labiodental [v] is not just limited to college-educated speakers, but is more a case of a dialectal variation. In order to state whether or not there is an actual phonemic contrast between /b/ and /v/ for Northern Mexican speakers, more research would need to be done including analyzing minimal pairs in the region.

The frequent presence of the labiodental [v] following low and mid-vowels contradicts what Piñeros (2009) says about fricativization; he states that fricatives are more common after high vowels (Piñeros, 2009, p. 313). Preceding high vowels were an influential factor in the analysis of the female speakers, and following high vowels were influential in all analyses except for non-educated speakers. This contradiction could be explained using Moreno Fernández's (2005)

work; he argued that high frequency words would become ingrained a speaker's mind in their entirety without regards to internal factor. Many of the words with a preceding low vowel could be classified as high frequency: 'a [v]er', 'a [v]eces', 'na[v]idad', for example. The fact that the phoneme /s/ was an influential factor across all analyses could be due to the phenomenon of assimilation: the process by which one phonological segment absorbs characteristics from a preceding or following segment (Hualde, 2005, p. 107). The phonological segment following the /s/ phoneme absorbs the fricative characteristic and since the fricative [s] is dental, it is possible that some of the place of articulation is assimilated as well, enabling the realization of the labiodental fricative [v], rather than a bilabial fricative.

After concluding the analysis of the data and discussing the global trends in the data, we shall return to the research questions proposed at the beginning of the paper to see if any conclusions can be gleaned.

1. What (if any) internal factors favor the production of the voiced labiodental [v]?

As previously mentioned, for all analyses the preceding phonological segment favored the production of the voiced labiodental [v]. This concurs with Hualde (2005) and Piñeros (2009) who both state that the preceding phonological segment is the most influential factor. However, as previously mentioned, the results show that what favors the production of the labiodental [v] is not a high vowel, but a low or mid vowel which contradicts both Hualde (2005) and Piñeros

(2009). This could be due to high instances of high frequency words with a preceding low or mid-vowel. A preceding fricative /s/ also favored the realization of the voiced labiodental [v] which could be an example of the phenomenon of assimilation in the manner of articulation.

For individual analyses, some different internal factors become significant. For all but the non-educated speakers, the following phonological segment also favored the production of the voiced labiodental [v], although not as strongly as the preceding phonological segment. In case of the following phonological segment, the high is the most influential factor, which agrees with what Piñeros (2009) and Hualde (2005) state about the influence of high vowels.

The non-educated speakers analysis is the only study where whether or not the phonological segment was intervocalic was determined to favor the production of the voiced labiodental [v]. From simple observation, it was noted that the non-educated speakers produced the voiced labiodental [v] more frequently in high frequency words, such as 'ver', 'vez', 'vivir'. So the significance of the intervocality of a phonological segment could be due to high instances of a high frequency word being preceded by a vowel or containing an intervocalic grapheme v, for example 'a veces', 'yo vivo', or 'navidad'.

2. Does the level of education of the speaker affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?

From both the global analysis and the individual gender analysis, it is evident that the level of education of the speaker is an influential factor in the

realization of the bilabial phoneme /b/ as the voiced labiodental [v]. In the global analysis educated speakers produced the voiced labiodental [v] 17% more than the non-educated speakers. In the analysis of the female speakers, the educated speaker produced the voiced labiodental [v] 8% than the non-educated speaker, and in the analysis of the male speakers, the educated speaker produced the voiced labiodental 24% more often than the non-educated speaker. These results support the hypothesis put forth by Lope Blanch (1988), that educated speakers are more likely to produced the voiced labiodental [v] in order to show faithfulness to the orthography of the word.

3. Does gender affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?

Only in the educated speakers analysis was the gender of the speaker an influential factor in the realization of the bilabial phoneme /b/ as the voiced labiodental [v]. In this analysis, the male produced the voiced labiodental [v] 10% more than the female. This is an unexpected finding that has not been mentioned in any research that I have found to date. It is possible that since the male has a higher degree of education (he had already completed his Master's), he attempts to demonstrate a higher degree of orthographic faithfulness in his speech. It is also possible that since the male speaker has been in the United States for three more years than the female speaker, he has a higher degree of English orthography influence in his speech.

4. Does the stylistic setting affect the realization of the bilabial phoneme /b/ as the voiced labiodental [v]?

The context was significant in the global analysis, the educated speakers analysis and the female speakers analysis. In all cases the paragraph reading was the factor to most likely predict the realization of the bilabial /b/ as the voiced labiodental [v], which somewhat contradicts Lope Blanch's (1988) hypothesis that the labiodental [v] would be produced more in the most formal setting. The word list was the most formal context and it was a predicative factor in the educated speakers and female speakers analysis, but not more so than the paragraph reading. Since the word list is still a more formal context and both the paragraph reading and the word list were stronger predictors than the interview, Lope Blanch's (1988) theory is not completely contradicted.

As mentioned previously, the fact that the paragraph reading was a more influential factor than the word list could be due to high frequency words appearing more in the text, where as the word list had more low frequency words. More analysis needs to be done to verify if the variation in significance across analyses was due to word frequency or speaker variation.

CONCLUSIONS

The findings of this study corroborate hypotheses put forth by Martinez-Gil (1998) and Lope Blanch (1988), the most influential factor in predicting the production of the voiced bilabial plosive /b/ as the voiced labiodental fricative [v]

is whether or not the phonological segment is orthographically represented with the grapheme *v*. Lope Blanch (1988) states that educated speakers are more likely to adhere to proper orthography, but orthographic representation was the most influential factor in the production of the voiced labiodental in every analysis. From this it can be concluded that all participants, not just educated ones, wished to maintain a phonetic distinction between the grapheme *b* and the grapheme *v*. The level of education of the speaker does influence the realization of the voiced labiodental [v], but it cannot be said that the voiced labiodental [v] is a phenomenon exclusive to educated speakers.

It is possible that this phenomenon is a result of hypercorrection. In only two of the six instances where the grapheme *b* was pronounced with the voiced fricative allophone [v] the speaker was educated. The male speaker said “o[v][v]iamente” (obviously), and the female speaker said “más [v]ien” (better). Both of these instances could be a case of the aforementioned phenomenon assimilation in the manner of articulation. The remaining four instances were all the non-educated speakers. Which supports the theory that educated speakers tend to hypercorrect their speech and pronounce the voiced fricative [v] in order to emphasize the difference in the graphemes.

Limitations of the Study

This study included only a small sampling of participants. Since only one educated male speaker, one educated female speaker, one non-educated male

speaker, and one non-educated female speaker contributed, variations in speech that have been attributed to a group such as female or educated could in fact be caused by individual speech patterns. The number of participants should be amplified to see if the trends of this study hold true in a study of a larger scale.

Another participant discrepancy in the study is that all participants speak English and are currently residing in the United States. The study should be replicated in with speakers residing in Northern Mexico and possibly with speakers that do not speak English to remove any English orthographically-based interference.

If this study were to be repeated, video taping the participants in addition to use a tape recorder would make coding the tokens as either a labiodental fricative or a bilabial fricative more conclusive since occasionally the Praat graphs were ambiguous. The data should also be analyzed according to word frequency to statistically verify the observation that higher frequency words are more likely to be pronounced with the voiced labiodental fricative [v].

Suggestions for Future Research

As previously mentioned future research should focus on amplifying the scale of the study. The number of participants should be augmented as well as more factors studied. Additional factors to be studied should include word frequency and age of the participant, with various age groups to see if the phenomenon is something new or if it is present in older speakers as well. Future

research should also be done exclusively in Northern Mexico in order to ascertain if trends are the result of English influence. Also, because this phenomenon has been so little studied across the globe, the study should be replicated in other Spanish speaking regions to see if this is a phenomenon exclusive to Northern Mexico. Future study on the realization of the voiced bilabial plosive /b/ as the voiced labiodental fricative [v] may call into question whether or not the Spanish variety should add another sound to the description of its phonetic repertoire.

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APPENDIX A
IRB APPROVAL FORM



To: Alvaro Cerron-Palomino

From:  Mark Roosa, Chair
Soc Beh IRB

Date: 03/15/2012

Committee Action: **Exemption Granted**

IRB Action Date: 03/15/2012

IRB Protocol #: 1202007474

Study Title: Orthographic Loyalty in the Spanish of Northern Mexican Speakers

The above-referenced protocol is considered exempt after review by the Institutional Review Board pursuant to Federal regulations, 45 CFR Part 46.101(b)(2) .

This part of the federal regulations requires that the information be recorded by investigators in such a manner that subjects cannot be identified, directly or through identifiers linked to the subjects. It is necessary that the information obtained not be such that if disclosed outside the research, it could reasonably place the subjects at risk of criminal civil liability, or be damaging to the subjects' financial standing, employability, or reputation.

You should retain a copy of this letter for your records.

APPENDIX B
INSTRUMENTS

Word List:

basura	Montevideo	viento
valor	club	hablante
recibir	savia	video
había	polvo	vuestro
vivo	obedecer	corregir
patio	revuelto	nuboso
devoción	vende	volar
vaca	lisiar	convalecencia
paz	adversidad	esbelto
vez	traer	desvalorizar
bombero	verdad	nobleza
gastronómico	simpatía	chauvinista
televisión	heroísmo	informe

Paragraph:

From *Harry Potter y el misterio del príncipe* by J.K. Rowling

“**Iba** a ir con ella a la fiesta de **Navidad** de Profesor **Vector**, pero nunca me dijo... no somos **novios**...” Harry, consciente de que su amigo lo **estaba** mirando, **volvió** una página. La **voz** de Ron fue reduciéndose a un murmullo apenas **audible**, aunque Harry le pareció **divisar** otra **vez** las **palabras** “Krum” y “que no se queje”.

Por la noche, Ron **estaba** enroscado alrededor de **Lavender** y ni se **fijaba** en lo que hacía su amigo. Hermione se **negaba** a sentarse en la sala común si Ron **estaba** allí, de modo que Harry se reunía con ella en la **biblioteca**, y eso significaba¹⁰ que tenían que **hablar** en **voz baja**. “Puede hacer su **voluntad** y **besarse** con quién quiera. Me importa un **bledo**, de **verdad**.” Dicho eso, **levantó** la pluma. Harry no dijo nada (temía perder la **voz** para siempre), se inclinó algo más **sobre** *Elaboración de pociones avanzadas*, de **vez** en cuando tomando notas acerca de los elixires eternos.

¹⁰ All –aba endings from this point on will not be used for analysis.

Interview questions:

- ¿En que año naciste?
- ¿Dónde naciste?
- ¿Creciste allá? (sí no dónde?)
- ¿Cuándo te mudaste aquí?
- ¿Viviste en otra parte de los EEUU?
- ¿Qué hacían tus padres? ¿Qué nivel de educación tienen tus padres?
- ¿Cuántos años de educación tienes tú?

Juventud

- ¿Dónde asististe a la escuela primaria?
- ¿Cuál fue tu clase favorita y por qué? ¿Una maestra o maestro favorito (por qué)?
- ¿Quién era tu mejor amigo? ¿Cómo era?
- ¿Qué hacían ustedes?
- ¿Qué hacías después de clases? ¿Asistías a una clase de baile o artes marciales?
- ¿Recuerdas una vez que te metiste en un lío grande? ¿Qué hicieron tus padres?
- ¿Cuál era tu programa de televisión favorito?
- ¿Qué querías ser? ¿Por qué?
- ¿Cuál era tu película favorita?
- ¿Tenías una mascota? ¿Cómo se llamaba? ¿Cómo era?

El colegio (si asistieron al colegio)

- ¿Dónde asiste al colegio?
- ¿Había una vez que te pusiste avergonzada/o? ¿Qué pasó?
- ¿Tenías un novio/a?
- ¿Qué hacías con tus amigos?
- ¿Qué hacías los fines de semana?
- ¿Practicabas un deporte?
- ¿Trabajabas? ¿Cómo qué?
- Otra vez, ¿te metiste en un lío? Fuiste a la oficina? ¿A la estación de policía?
- ¿Cuál era tu “lugar” para relajarte sólo o con amigos?
- ¿Había una clase que no te gustaba u odiabas? ¿Por qué?

La Universidad (solamente a las personas con educación universitaria)

- ¿Dónde hiciste tus estudios de pregrado?
- ¿Cuál fue tu clase favorita?
- ¿Estás orgulloso(a) de un trabajo específico? ¿De qué se trata?
- ¿Cuál es la diferencia más grande entre las universidades de los EEUU y México?
- Cuéntame sobre una noche de aventuras. (¿fiesta? ¿borracho/a?)
- ¿Cuál era tu “lugar” para relajarte sólo o con amigos?
- ¿Había una clase que no te gustaba u odiabas? ¿Por qué?

¿Cuántos años te tomó graduarte?
¿Cómo te sentiste al recibir tu certificado?

Post Grado

¿En qué te enfocas ahora, qué tipo de literatura?
¿Qué te gusta más enseñar? o no qué te gusta?
¿Si pudieras cambiar una cosa del programa de maestría(doctorado) qué sería?
¿Qué quieres hacer con tu grado? (¿Enseñar?), ¿dónde?
¿Has ido a una conferencia? ¿Cómo te sentiste?
¿Has publicado alguna vez? Dime sobre el proceso, ¿cómo te sentías?
Háblame de tu disertación/tesis...

Preferencias

¿Qué tipo de película prefieres? ¿por qué?
¿Qué te gusta hacer ahora con tu tiempo libre?
¿Te gusta Arizona? ¿Qué no te gusta?
¿Piensas casarte? ¿Cuándo?
-Si ya están casados, cómo fue la boda?
¿Quieres hijos? ¿Cuántos?
-Si ya tienen hijos: ¿cómo son?, ¿cómo se llaman? ¿Qué les gusta?

Otras cosas

¿Cómo son los edificios en tu ciudad natal?
¿La comida? ¿Hay un plato especial?
¿Hay celebraciones especiales para los días festivos?
¿Qué te gusta hacer para relajarte aquí?
¿Qué hiciste el fin de semana?

APPENDIX C
WORD FREQUENCY LISTS

NEFP

abajo I
abuelito
abuelos
acostumbras
acostumbraste
arriba
barrancas
básico II
basquetbol I
batallando
bautizos
bebé III
bebés
béisbol III
bendición
bien IIIII
billes
bodas III
bonita I
bonitas
bonito IIIII
botas
buen
buena
bueno IIIII
buscando
cerveza II
civil
club
cobre
estábamos II
estaban
estuve
estuvo
eventos
flexibles
fútbol
gustaba
había II
habla II
hablan

hablar
hombre
hombres IIIII
íbamos II
ibas
jóvenes
llevábamos
llevamos
llevan
llevar II
librería
navidad II
novecientos
novios
nueve III
nuevo
pavo
primavera
problema II
problemas IIIII
reservadas
respetábamos
responsable
responsabilidad
sabe
sabemos
sabes II
suave III
también III
televisión
todavía
trabajar
trabajas
trabajo IIIII
va II
vacaciones II
vainilla
vamos II
van III
varios II
vas
vaya
vayas

veinte
veinti
veintiún
ver III
veras IIIII
verdad II
verlo I
verlos II
vestido
vejita
viernes
vinieron
vinos
visitamos
visitar
viste
vive II
viven II
vives
viví
vivo
voleibol IIIII
voy IIIII

NEMP

abajo III
abierto
abrazarlos
abusado II
álbum
andaba
avanzando
avanzar
avanzo
Avelino IIIII
bache
bailando
bajo II
banda IIIII
baria II
básico
bebé II

belt
biblioteca
bien IIIII
blanca
bloque
bodas
boleros
bolsa
bonito II
bonita
bonitas
botón
brinco
buen IIII
buena IIII
buenas II
bueno III
burla
burlaban II
busca
buscaba II
buscamos
buscando
buscar II
busqué II
caballeros
cabeza
cambia
cantaba II
combustible
cosechábamos
cumbia
daba
empezaba
enseñaba
equivocado
escribí II
escribía IIII
escribiéndolas
estaba IIIII
estábamos II
estuve II
eventos
grabación

grabada
gustaba II
había II
habla
hablando IIII
hablar
hablas III
hablo
hombre IIII
hombres
iba IIII
indispensable
invertido
inviertes
invierto
invirtiendo III
invitaban
libro
libros III
llamaba
llave
lleva II
llevaba
llevar IIIII
llevarles
maravillosas
miraba
necesitaba
nombre II
nombres III
novecientos IIII
noventa IIIII
nueva
nuevo
obstáculos
olvido
palabra
palabras IIII
pasaba
pintaba
polvo II
positivo II
practicaba
preguntaba

probablemente IIIII
problemas III
promover
pronunciaba
pronunciaban
recibió
responsabilidades
sábado IIII
sabe II
saben II
saber III
sabes IIIII
sabía IIIII
sembrar II
servicio IIIII
siembra
sirve III
sirvo
sonaban
también IIIII
terminaba
tocaba
todavía III
trabaja III
trabajaba III
trabajador
trabajadores II
trabajando III
trabajar IIIII
trabajes
trabajo IIIII
trabajó
trabajos
travieso
tuve
usaba
va IIII
vacas
vamos III
van IIIII
vas IIIII
vaya
veces IIIII
veía

veinte
veinticuatro III
venía II
ventanas
veo III
ver IIIII
verdad
vergüenza
verlos
ves
vestidos
vez IIIII
viajar
vida IIIII
viene II
vienen
vienes
viernes II
violines
vive
vives
vivía IIII
vocalizar
volver
voy IIIII
vuelta
vuelves
vuelvo

AFP

absolutamente
abuelos
aburrido I
acabó
actividades
alberca III
atractivo
aves
aviones IIII
bajar
bajó
banca
banco

barato III
bebé
bebés II
bien IIIII
boda
boletos
bonita
bonitas III
bonito IIIII
bosque
buen II
buena III
bueno IIIII
bus
buscar II
buscaste
cabeza II
cambia II
cambiamos
cebras II
embarazada
escribí
estaba
estábamos
estable II
estabilidad
exhibición II
deberían
deberías II
debo
diversión
divertí
divertido IIIII
doble
escribiendo
estaba IIIII
estuvo
gustaba II
había III
habían
habla IIIII
hombres
horrible IIIII
horribles

iba III
imposible II
inversa
jugaba
labrador II
labradores III
levanto II
libros
llévala
llevan
llévatela
llévate
llevé
lluvia
muebles
navidad
noventa
novio IIIII
nuevo
pagaba II
pensaba
posible II
preguntabas
publicidad II
pueblo
recibí
revés
sabe
saben
sabes IIIII
sabía
salvaje
salvajes
sobrina IIII
sociable
sociables
subí
también IIIII
terrible II
todavía
trabaja
trabajaba
trabajando III
trabajar III

trabajo IIIII

traviesa
tuviste
tuvo
universales
universidad IIII
va IIIII
vacaciones
valor
vamos III
vampiro
van IIIII
vas IIIII
vaticano II
vea
veces IIIII
vecinos II
veinte III
veinti
veinticuatro
veintiséis
venado
venden
venderlos
vendía
ver IIII
veras
verdad IIIII
vergüenza
verla
verlas
ves III
vez IIIII
vi III
viaja
viajar IIIII
viajaron II
viaje
viajó
vida II
vieja
visita
visitarlos
visitas III

visto III
vive II
viven
vivíamos
viviendo
vivir
volver
volvió
voy IIIII
vuelo II
vuelo

EMP

abierto II
absolutamente
acostumbrado
acostumbrarme
alfombra
ambiente
árbol
avanzada
aventura III
bachillerato II
bailar
baja II
bajas
bajo
balazos
banco
bancos
barres III
básico
básicas
bastante III
bicicleta
bien IIIII
boda
brasileña
buen II
buena IIIII
buenas
bueno IIIII
buenos II

buscamos
buscar
caballeros
cambiamos
cambiarse
cerveza
Chivas IIII
club
clubes IIII
competitivo
competitivos
comprábamos
creativa
Derbez III
diciembre
diversa
diversión IIIII
divertía
divertirse
división II
escribir
estaba IIIII
estábamos
estaban IIII
establecerme
estuviera
estuvo II
evitar
favorita
favorito II
flexibilidad
fútbol II
gustaba IIIII
gustaban
haber
había IIIII
habían
habitantes
hamburguesas
hombre
iba
iban
joven II
jueves

jugaba II
laberinto
laborioso
libertad II
libre
libros
llamaba III
maravillosos
movernos
moví
nivel
nombre III
novecientos
noventa II
novia III
novias II
noviembre
nueve II
obviamente
olivios
palabras
pasaba
preocupaba II
problema
problemas II
pública
pueblito
pueblo
regresaba
resolver III
revés
saber II

sabía IIIII
septiembre
sobre II
también IIIII
televisión IIII
todavía III
tomaba
trabajaba II
trabajaban
trabajar
trabajara
trabajé
trabajo IIIII
tuve IIIII
tuviera II
tuviéramos
universidad IIIII
va
vacaciones
valle
vamos IIII
van
varios
vayan
ve IIII
vea
veces IIIII
vecindario
veía IIII
veinte II
veintidós
veintitrés

veintiocho
veintiséis
veintiún
veintiuno
vemos
venden II
venía
veo IIII
ver IIIII
verano II
verla
ves
vez IIIII
vi IIIII
viaja
vida IIIII
videojuegos
viera
vimos II
vine
violencia IIIII
violenta
violentas II
visto II
viven
vivía IIIII
vivíamos
vivían II
viviera II
vivir II
vocación
voy

APPENDIX D
SPECTROGRAPHS

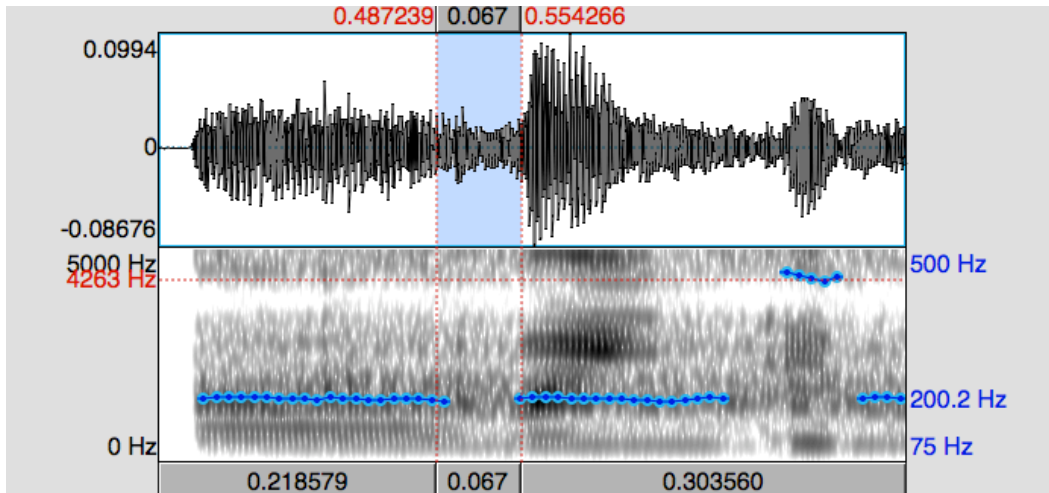


Figure 1. A spectrograph showing the pronunciation of the voiced labiodental [v]. The labiodental [v] is shown in the highlighted area.

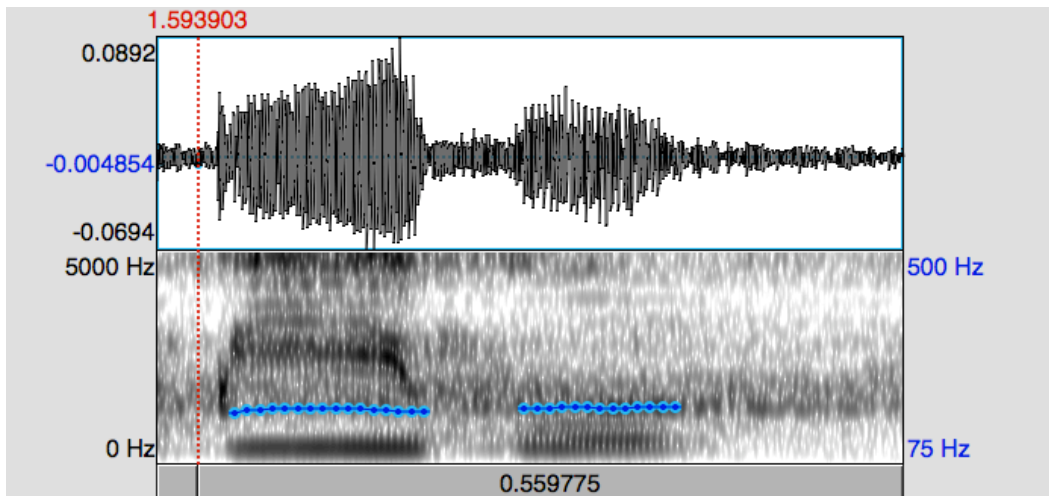


Figure 2. A spectrograph showing the pronunciation of the voiced bilabial approximant [β]. The approximant [β] starts just after the red line.

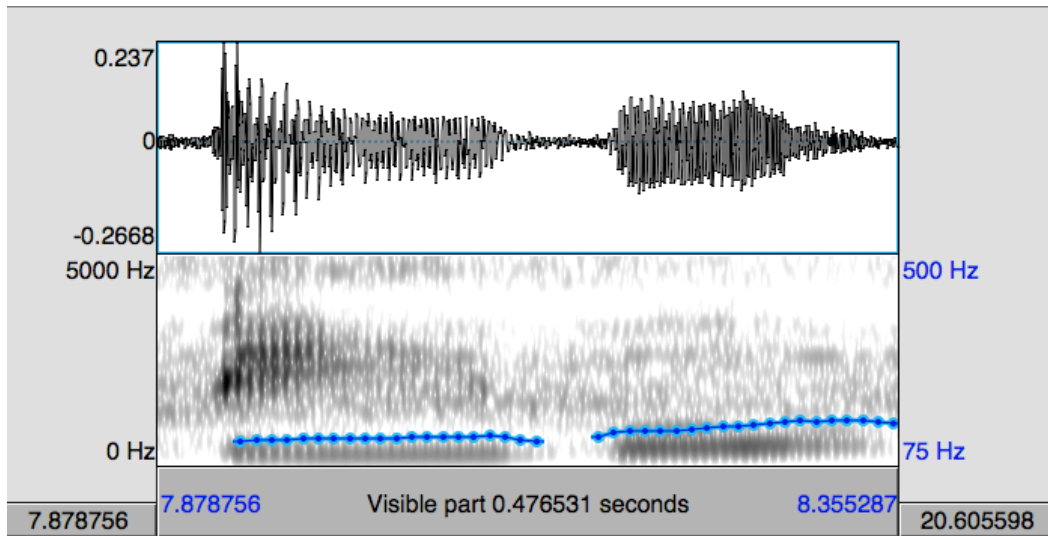


Figure 3. A spectrograph showing the voiced bilabial plosive [b]. The plosive [b] starts at the beginning of the screen.