

A Sociophonetic Approach to Vowel Raising: Social Networks in Rural Michoacán, Mexico

Jennifer Barajas

Department of Spanish & Portuguese

The Ohio State University

1. Introduction

This paper presents new data that allows for a sociophonetic analysis of variable unstressed mid vowel raising in the Spanish of rural Michoacán, Mexico. This process refers to the non-standard realization of /e, o/ as [i, u], respectively, such as in *come* [kómi] 'he/she eats,' that can be found in this dialect, together with the more standard pronunciation of [kóme]. Previous studies briefly mention this phenomenon (e.g. Moreno de Alba 1994, Parodi and Santa Ana 1997), but fail to offer a detailed characterization of the contexts that influence raising. I present an acoustic analysis of these mid vowels to analyze the linguistic and social factors that condition variable raising in Michoacán Spanish, in order to provide the first thorough account of this vocalic process. My project provides the first variationist account of post-tonic unstressed mid vowel raising in rural Michoacán Spanish based on evidence from acoustic data, and it further contributes to the field of Hispanic Linguistics by focusing on an understudied variety of Spanish. I discuss how linguistic features are related to social factors and, more specifically, how phonetic realizations represent social meaning. My study of linguistic variation within this dialect of Spanish seeks to determine how variation of phonetic realizations are a way to use language to form a social identity. For this project, and in my dissertation, I aim to find the connection between sociolinguistics and phonetics by combining linguistic theory with experimental results. Before describing my own study, let me begin with some background information about Spanish vowels and the vowel raising process.

2. Previous studies on vowels and vowel raising

Spanish has a five vowel system where each vowel is typically described in terms of the articulatory characteristics of tongue height and the horizontal position of the tongue (Gil

Fernández 1990). For the height dimension, Spanish uses three categories which are low, mid and high. For the horizontal dimension, Spanish also differentiates three categories which are front, central and back. A third dimension that is sometimes mentioned is lip roundness, according to which a vowel can be characterized as rounded or non-rounded. In Spanish, this dimension is non-contrastive because the back vowels are the only vowels that are rounded. Based on these descriptions, the vowels form the shape of a triangle when they are arranged in a table based on their articulation. This can be seen in table 1 below (based on the figure from Hualde 2005:121). Thus, /i/ is a high, front vowel, /e/ is a mid, front vowel, /a/ is a low, central vowel, /o/ is a mid, back vowel and /u/ is the high, back vowel. The back vowels /o/ and /u/ are rounded and the front vowels and central vowel are non-rounded.

	Front	Central	Back
High	i		u
Mid	e		o
Low		a	

Table 1: Spanish vowel phonemes

Vowel raising refers to the process where the mid vowels /e, o/ are realized as their higher counterparts [i, u]. Thus a word such as *grande* ‘big,’ which would typically sound like [grande] sounds like [grandi] when the last vowel is raised. An example with the back mid vowel is *ellos* ‘they’ which would sound like [ejos] without raising or [ejus] with raising. Vowel raising has been studied in the Spanish of northwestern Spain and Puerto Rico and is briefly mentioned in Mexico. I will now summarize the findings from those studies.

Holmquist (1985) analyzes the Spanish in Uceda, located in northwestern Spain, where the variety of Spanish is usually referred to as *montañés*. He studies the tendency for the mid vowels to be raised to high vowels, especially in word-final position. Holmquist gives the examples of *leche* [le.tʃi] ‘milk’ and *pozo* [po.θu] ‘well.’ He notes that, “especially noticeable in their speech is the frequent use of *u* in word-final position where in Castilian one finds *o*” (1985:192). Holmquist found that older generations are more likely to produce raised vowels than younger generations. Farmers and people who own mountain animals are also more likely to produce raised vowels. Holmquist suggests that the younger generations have vowel raising less frequently due to their industrialized, modern lifestyle, rather than the farming lifestyle of their elders. Women are closer to the prestige form than men, since they reject the dialect associated with the land. Holmquist concludes that vowel raising is dying out with the younger generations in this area as they aim for the more prestigious standard. Moreover, this study shows that quantitative analysis is a useful tool even in small communities because the results present a clear social stratification.

Vowel raising in Puerto Rico has been studied by several researchers. Navarro Tomás (1948) discusses mid vowel raising in the western part of the island, particularly in word-final position. His impressionistic analysis comes from listening to how people speak as they answered questions from his questionnaire. He determines that final mid vowels tend to be pronounced like a high vowel when preceded by a stressed high vowel, a diphthong, or a palatal consonant.

Holmquist (1998) examines vowel raising in men’s speech in a rural agricultural community in Puerto Rico. He analyzed 60 sociolinguistic interviews, which were obtained from his host family or their relatives through the “friend of a friend” method. When working with the

30 male interviews, some of the social variables that he studied were employment, length of time in and out of the community, membership in social groups, and education. Holmquist found that farmers tend to have a higher rate of vowel raising than other occupational groups, which corresponds with what he found in northwest Spain. Holmquist tested whether two phonological factors favor vowel raising: a high tonic vowel in the preceding syllable (such as in *díce* ‘he/she says’), or a preceding palatal consonant (as in *ócho* ‘eight’). His findings coincided with those of Navarro Tomás (1948) and vowel raising was favored in both contexts, with similar frequencies for back and front vowels. He also found that a preceding high glide had a positive effect, but not to the extent that high vowels did.

Holmquist used social factors to group the males into networks. He gave each individual a score based on the following four factors: 1) length of time spent away from Castañer, 2) membership in local groups and institutions, 3) education (primary school or less, secondary school, post secondary school, and post secondary school outside of Castañer), and 4) employment (agricultural, nonagricultural or commercial, and professional) (1998:76). Although he explains that the highest scorers were considered part of the “dense” network and the lowest were part of the “open” network, he does not describe how the scores were derived. He concludes that dense networks of males are more likely to have vowel raising and open networks can have it when they shift styles to the local style.

Oliver Rajan (2007, 2008) adds to the research on vowel raising in the coffee zone of Puerto Rico by conducting an auditory impressionistic study, verified by some acoustic analysis, of the vowels involved. Oliver Rajan (2007), based on 69 sociolinguistic interviews with 29 females and 40 males, focuses on mobility, and other social factors, and how these affect the change in vowel production. Oliver Rajan’s results corroborate the findings of Holmquist (1998,

2005), that back mid vowel raising is more frequent than front and that raising is favored in older generations, those with less education, and those who have not left the community. The author concludes that overall there is no significant difference in vowel raising between males and females, age is an important factor, and since younger generations have less vowel raising, this feature could eventually disappear.

In her much more elaborate sociophonological analysis, Oliver Rajan (2008) explains that she analyzed the last 15 minutes of the 69 interviews and took 100 tokens per subject, half of the front variable and half of the back variable, for a grand total of 6900 tokens. The external variables analyzed were age, gender, occupation, education, and mobility, which are the same as those analyzed by Holmquist (1998, 2005). She found that mobility is the most influential factor and, using the same mobility scale from her previous study, those with more mobility are less likely to have vowel raising. Vowel raising increases with age, but there is not a significant difference for males and females. People with less education are more likely to have vowel raising than those with more education. Oliver Rajan found raising 16% of the time for the front mid vowels and 21% of the time for the back mid vowels, which was a significant difference between the two ($p < .001$). Overall the vowel raising feature occurs about 18% of the time.

Vowel raising in Mexican Spanish has not been as thoroughly investigated, although it is mentioned by several researchers. In a book about the speech of the state of Guanajuato, Boyd-Bowman (1960) makes an impressionistic analysis based on the speech of informants from various social levels. The author explains that in the cities of Guanajuato and Romita there is a closed quality to the final mid vowels making them sound like high vowels. He finds that vowel raising is more common after a palatal consonant and is not restricted to any particular social class as it is heard just as much in rural environments as it is in the city. Cárdenas (1967) also

describes final vowel raising in his book on the Spanish of Jalisco. The author mentions that final unstressed /e/ is the most likely to have any changes, such as raising after a palatal consonant as in the words *noche* ‘night’ and *coche* ‘car.’

Moreno de Alba (1994) presents data from the *Atlas lingüístico de México* (ALM). He shows that mid vowel closure happens frequently in several states, including Michoacán. His findings suggest that /o/ closure occurs with more frequency and in more places than /e/ closure. Moreno de Alba concludes that there tends to be an inverse relationship between frequency of vowel closure and socio-cultural level, since raising is more frequent in illiterate or semiliterate people than in middle or upper class people (1994:47). Parodi and Santa Ana (1997), in an article describing speech communities in the rural areas around Zamora, Michoacán, Mexico, discuss regional features for Michoacán, the most relevant for the current project, including what they call the closing of mid vowels, or the raising from mid to high unstressed vowels. Parodi (2001) also makes mention of the closure of mid vowels as a regional feature of Michoacán in her article about language contact in the Americas. The author characterizes the use of vowel alternations as one of the features of the typical speech of a *ranchero* ‘rancher.’ Parodi discusses that there is homogeneity of speech within the rural *ranchero* communities.

After a review of the previous studies on vowel raising, especially in Mexico, it is clear that a systematic investigation of vowel raising is missing from the literature. Most notably lacking is the acoustic evidence for vowel raising and a complete description of the contexts where it occurs in Mexico. This is precisely where my study fits in and I will now describe how my study was conducted.

3. Methodology

The area where I conducted my research is called El Colongo, affectionately known as *un ranchito* ‘a small ranch’ by the people who live or once lived there. This is probably due to the rural nature of the town, where it would not be out of place to see a cow, horse, or some chickens crossing one’s path. The population of Colongo is approximately 700 people¹. Within Mexico, Colongo is located in the state of Michoacán, which we can see along the western coast in the map of Mexico in Figure 1. Within the state of Michoacán, Colongo is located in the Northwest, within the municipality of Ixtlán de los Hervores, with the closest large city center being Zamora. Figure 2 shows a partial map of Michoacán where I have circled Ixtlán de los Hervores and Zamora, and the arrow indicates Colongo.

Colongo is a small, rural community whose economy is mainly based on agriculture. In this way, it is similar to the communities in Spain and Puerto Rico where vowel raising has been more extensively studied (Holmquist 1985, 1998, 2005 and Oliver Rajan 2007, 2008). Most of the men, and some women too, work in the fields outside of town. Many families also run small businesses out of their homes, such as selling some type of food or maintaining a small store.

¹ Taken from: <http://mexico.pueblosamerica.com/i/el-colongo/>



Figure 1: Map of Mexico²

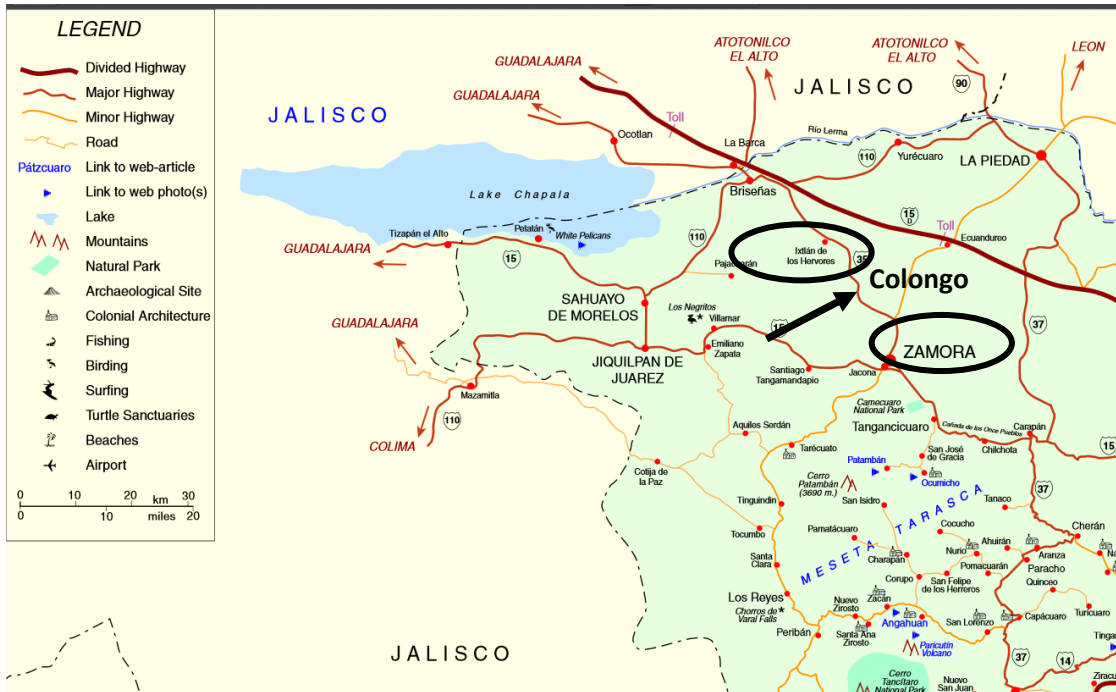


Figure 2: Partial map of northwest Michoacán, showing the region around Colongo³

² Image taken from: <http://2.bp.blogspot.com/-lc5tAdTiHa/UaZ19BKiybl/AAAAAAAAHIU/ABkWzpg3tBU/s1600/mexico+state+map.jpg>

The research questions that I address in the current project are:

1. Is the vowel raising in Michoacán Spanish similar to previous studies of other varieties?
2. Is raising conditioned by any social or linguistic factors in this dialect?

In order to answer these questions I conducted sociolinguistic interviews with 32 participants from the Colongo community. Following previous work on social networks, I used the “friend of a friend” method. Because I had visited the area previously, I was not quite a stranger, but not an insider either. All participants either had first or second order ties to me, meaning they either knew me directly or knew someone that I knew (Milroy 2002). All the interviews were recorded either in the house of my mother-in-law or the house of my brother-in-law next door. My goal was to create a semi quiet environment where the participants would feel comfortable, as if they were just sitting on a neighbor’s couch having a casual conversation. I asked a few questions about topics such as school, work, celebrations, food, family, etc. in order to encourage story telling. Although there was a structured pattern for the topics, like the conversation modules Labov (1984) describes, the conversation followed whatever the participant seemed most excited to talk about. The end result was a series of 32 interviews ranging in length from 15 minutes (due to a microphone malfunction) to 1 hour long, with the average interview lasting about 30 minutes. However, due to the poor recording quality of one interview, it was excluded from the analysis. In the end, I analyzed 31 recorded interviews with participants that ranged in age from 13 to 84 years old.

Following previous research on vowel raising variation, I investigated mid vowels only in the post-tonic position. Thus, the vowel tokens that are taken from the recordings are the front and back post-tonic unstressed mid vowels, /e/ and /o/, since there is virtually no raising in the

³ Image taken from: <http://www.mexconnect.com/assets/0000/5647/mapmichoacanpdf.pdf>

pre-tonic and tonic positions. Vowel tokens in monosyllabic words were excluded for the same reason. However, there may be more than one vowel analyzed per word in longer words such as *vámonos* ‘let’s go,’ where both instances of /o/ were tested for raising. Thus, the target vowel did not always occur in the final syllable. Also, target vowels that were directly followed by another vowel (such as *baile y* ‘dance and’) were excluded because the possible interaction of those two vowels may have interfered with the formant measurements.

For each interview I chose to start looking for tokens around the ten minute mark so at that point in the interview the speaker had become more comfortable with me and the recording situation. The data was analyzed using both auditory and acoustic measurements and each token was coded for a variety of linguistic and social factors. For the auditory judgment, I listened to each vowel token and made a binary distinction between raised and non-raised tokens. For the acoustic analysis, I measured the first two formants for each target vowel. This paper will report only the auditory results. Just a few of the linguistic factors that I considered were: backness of target vowel (front or back mid vowel), type of stress (penultimate or antepenultimate), preceding and following sounds, number of syllables in the word, and whether the target vowel occurs in an open or closed syllable. As for the social factors, I considered age, gender, education, occupation, and mobility (whether or not participants had left the community). Since many of these social variables are correlated, I created social networks as a way to divide the community into two different groups. Here, I will focus on just two independent variables, backness of the target vowel and the social network, in the results section. Both Holmquist (1985, 1998, 2005) and Oliver Rajan (2007, 2008) found mid vowel raising to occur more frequently with the back vowel, /o/, rather than the front vowel, /e/. My initial observations about

mid vowel raising in Colongo suggest the opposite, namely that there is more front vowel raising.

4. Results

Due to space limitations, I will limit my discussion today to the results for one linguistic variable, front or back mid vowel, and one social variable, social network. As for this linguistic variable, we see that there is significantly more raising when comparing the front mid vowel, /e/, where raising occurs 66% of the time, to the back mid vowel, /o/, where raising occurs 35% of the time. This means that we see less raising in a word like *pero* 'but' than in a word like *ese* 'that.' We can see these results summarized in table 2. We can also note the overall trend for raising when considering the two vowels together. Raising of the two mid vowels combined is approximately 47%, which is much higher than what has been shown in studies such as Oliver Rajan (2008) where the author found approximately 18% total raising in Puerto Rico.

	Not raised	Raised
/e/	614 (34%)	1182 (66%)
/o/	1805 (65%)	985 (35%)

Table 2: Percentage of vowel raising for both /e/ and /o/

Before discussing the results of the social networks, it is important to first consider mobility and the role it plays in the creation of these networks. Colongo has ties to the United States since many members of the community spend time working in the United States and then

return back to Colongo a few years later. While in the United States, they are in contact with English and other varieties of Spanish, including other varieties of Mexican Spanish. While I have not conducted an analysis of Colongo speakers while they are in the United States, I have noticed that while they are in the United States they tend to change the way they pronounce their vowels and this could be a strategy to fit in with the other Spanish speakers they encounter. However, upon their return to Colongo there is an adjustment as vowel raising is reincorporated into their speech. I have interacted with one of my informants in California where no vowel raising was noticed and yet this same informant spoke in a similar fashion as the other Colongo residents when I interviewed him in the community for the current study. For this reason, mobility, referring to time spent in and out of Colongo, is an important factor when constructing the social networks. The four factors that I used to create the social networks were: education, employment, time away from Colongo, and time back in Colongo. The factors that would lead to a more dense social network were less education, employment within or close to Colongo, little or no time away, and, for those who had been out of the community, more time back in Colongo. The factors that lead to an open network classification, on the other hand, were education, employment outside of Colongo, more time away, and less time back, for those who had been away. The participants were given a numerical score for each of the four factors and then the dense/open network distinction was made based on those scores. As we can see in table 3, participants in the dense network have significantly more raising than the participants in the open network, confirming my prediction. We will now move on to the discussion section where we will look at the significance of these results.

	Not raised	Raised
Dense network	1006 (49%)	1059 (51%)
Open network	1413 (56%)	1108 (44%)

Table 3: Vowel raising based on social network

5. Discussion and conclusions

The results show that in Colongo Spanish there is more /e/ than /o/ raising. This means that the raising is sensitive to the backness of the vowel. The process appears to be more advanced with /e/ than /o/ since raising occurs much more frequently with /e/. This is especially interesting considering that vowel raising in both Puerto Rico and Spain is more common with the back mid vowel /o/. This raises questions as to whether previous researchers had taken into account the higher token count in general of /o/ in the data. While there are more total tokens of /o/ in my data, even using just the raw numbers there is more /e/ raising. However, this was likely not the case for previous researchers since /o/ could be more frequent than /e/ in the position under analysis since it is the masculine marker in Spanish. Perhaps they used the raw numbers when considering which vowel had more raising

As for the social networks, more raising in the dense networks supports the findings of previous research. Typically, non-standard features are preserved in dense networks where there is less outside exposure and these same features are lost in open networks once the community members are exposed to the more standard dialect. We see that mobility plays a significant role in the networks in Colongo. There is the possibility of influence from other dialects of Spanish

for those who do leave Colongo. Yet, there is a sense of belonging to the community and I propose that the reintegration of the vowel raising feature is part of their Colongo identity.

This project constitutes the first thorough analysis of vowel raising in an understudied dialect of Mexican Spanish. I found significant differences in raising based on whether the vowel token is a front or back mid vowel. Additionally, my results provide further evidence for the variability of the vowel system in Spanish and demonstrate the role of social factors in linguistic variation. The findings presented in this paper are just the first steps in what will culminate in my dissertation. My investigation will provide the first acoustic account of unstressed mid vowel raising in Mexico based on the formant analysis of each individual vowel token. These formant values will be used in two ways. The measurements of the first and second formants will be continuous dependent variables that will be analyzed separately. Additionally, following the methodology of Barnes (2013) on Asturian influence on Spanish vowels, the formant values will also be the input for the Discriminant Analysis of Principle Components (DAPC) (Jombart, Devillard & Balloux 2010), which determines the statistical probability that each individual token will belong to either the raised or non-raised group. In this way, I will be able to analyze the vowel tokens using the formant values using both a continuous and binary analysis.

For future research, after the conclusion of my dissertation, I am interested in conducting a similar study with Colongo immigrants in the United States. The study will evaluate the rates of vowel raising of speakers outside of Colongo in order to determine whether or not there is a significant difference when compared to those who remain in Colongo. I would also like to conduct a perception study to see if Colongo residents and participants from other Spanish dialects have different reactions to vowel raising and what judgments they make about the speaker.

References:

- Barnes, Sonia. 2013. Morphophonological Variation in Urban Asturian Spanish: Language Contact and Regional Identity. Doctoral dissertation. The Ohio State University.
- Boyd-Bowman, Peter. 1960. *El habla de Guanajuato*. Imprenta universitaria.
- Cárdenas, Negrete Daniel. 1967. El español de Jalisco: Contribución a la geografía lingüística hispanoamericana. *Revista de filología española*, Anejo 85.
- Gil Fernández, Juana. 1990. *Los sonidos del lenguaje*. Madrid: Editorial Síntesis.
- Holmquist, Jonathan C. 1985. Social correlates of a linguistic variable: A study in a Spanish village. *Language in society*, 14: 192-203.
- Holmquist, Jonathan C. 1998. High-lands high vowels: A sample of men's speech in rural Puerto Rico. In Claude Paradis, Diane Vincent, Denise Deshaies & Marty LaForest (eds.), *Papers in Sociolinguistics: NWAWE-26 a l'Université Laval*, 73-79. Quebec: Université Laval.
- Holmquist, Jonathan C. 2005. Social Stratification in Women's Speech in Rural Puerto Rico: A Study of Five Phonological Features. *Selected Proceedings of the Second Workshop on Spanish Linguistics*, ed. Lotfi Sayahi and Maurice Westmoreland, 109-119. Somerville, MA: Cascadilla Proceedings Project.
- Hualde, José Ignacio. 2005. *The sounds of Spanish*. Cambridge University Press.
- Jombart, Thibaut, Sébastien Devillard & François Balloux. 2010. Discriminant analysis of principal components: a new method for the analysis of genetically structured populations. *BMC Genetics* 11. 94-108.
- Labov, William. 1984. Field Methods of the Project on Linguistic Change and Variation. *Language in use: readings in sociolinguistics*, ed. by John Baugh and Joel Sherzer, 28-53. Englewood Cliffs, NJ: Prentice-Hall.
- Milroy, Lesley. 2002. Social networks. *The handbook of language variation and change*, ed. by J. K. Chamber, Peter Trudgill, and Natalie Schilling-Estes, 549-72. Oxford: Blackwell.
- Moreno de Alba, José G. 1994. La pronunciación del español en México. Mexico City: El Colegio de México. Serie de Estudios de Dialectología Mexicana.
- Navarro Tomás, Tomás. 1948 [1999]. *El español en Puerto Rico*, 3rd edn. San Juan: Editorial de la Universidad de Puerto Rico.
- Oliver Rajan, Julia. 2007. Mobility and its effects on vowel raising in the coffee zone of Puerto Rico. In Jonathan Holmquist, Augusto Lorenzino & Lotfi Sayahi (eds.), *Selected Proceedings of the Third Workshop on Spanish Sociolinguistics*, 44-52. Somerville, MA: Cascadilla Proceedings Project.
- Oliver Rajan, Julia. 2008. Vowel Raising in Puerto Rican Spanish. Doctoral Dissertation, University of Illinois at Chicago.

- Parodi, Claudia & Otto Santa Ana. 1997. Tipología de comunidades de habla del español rural al estándar. *Nueva revista de filología hispánica*, 45 (2), 305-320.
- Parodi, Claudia. 2001. Contacto de dialectos y lenguas en el Nuevo Mundo: La vernacularización del español en América. *International Journal of the Sociology of Language*, 149, 33-53.