

Mobility and its Effects on Vowel Raising in the Coffee Zone of Puerto Rico

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1. Introduction

One would expect a small island like Puerto Rico which is 100 miles long and 36 miles wide to have linguistic homogeneity, but, on the contrary, it has more linguistic diversity than one might expect. It is very common to hear people from San Juan or other costal areas mocking people from the mountainous western region of Puerto Rico about the way they raise mid-final vowels /e/ and /o/ to [i] and [u] respectively. One of the most common comments mocking this feature is: “*La genti di Larih toma lechi di poti.*” ‘People from Lares drink canned milk.’ Vowel raising in Puerto Rico has been documented by Navarro Tomás (1948) and Holmquist (2005, 2003, 2001 and 1998). Based on previous studies and my own observations as a native of Puerto Rico, I started to investigate this linguistic phenomenon bearing in mind these questions:

- If vowel raising is stigmatized among other islanders, why does it still exist?
- What extralinguistic factors influence vowel raising the most?
- Is vowel raising stable or is it changing?

A total of 69 sociolinguistic interviews were conducted across the different municipalities composing the coffee zone of Puerto Rico. Each recorded conversation lasted from 30 minutes to an hour giving the interviewees the chance to have two different speech styles: Careful and casual. The recorded interviews were later transcribed and analyzed using Pratt¹.

The informants were categorized based on their gender, age group, education, occupation and mobility. Two linguistic variables were analyzed: 1) vowel raising from /e/ > [i], and 2) vowel raising from /o/ > [u]. Vowel raising frequencies were correlated statistically to the presented independent variables. Mobility turned out to be the most influential social factor affecting vowel raising.

2. Overview of the Linguistic Feature

Navarro Tomás (1948) was the first to document the main differences between vowels used by those individuals living in the mountainous western interior of the island and those living in urban costal areas. He indicated that people from the western central area of Puerto Rico raise the final front mid vowel /e/ to [i] and the back mid vowel /o/ to [u]. For example, the word /pote/ ‘can’ is pronounced as [poti] and the word /pelo/ is articulated as [pélu] ‘hair.’ Holmquist (1998, 2001) confirmed Navarro’s findings when he studied the rural community of Castañer located in the western mountains of Puerto Rico. Holmquist (1998) found that front mid vowel /e/ raises to an [i] and back vowel /o/ raises to an [u] more frequently when the preceding stressed vowel is high such as /fruto/ > [frútu] ‘fruit’, /dulce/ > [dúlsi] ‘sweet’. He also found that unstressed mid final vowels with preceding palatal consonants also have the tendency of becoming high vowels. Holmquist (1998) states that vowel raising is also dependent on the morphological categories. Nouns and verbs had more raised vowels than any other grammatical category. Vowel raising from /o/ > [u] was more prominent than vowel raising from /e/ > [i] in both nouns and verbs. Both Navarro Tomás (1948) and Holmquist (1998) findings identify two positions that are particularly favorable for vowel raising of mid vowels: 1) after a stressed high vowel, and 2) after a preceding palatal or anterior consonant. The acoustic analysis used in this study presents similar results.

Vowel raising has been found in other peninsular Spanish dialects (Penny 1969, McCarthy 1984, Holmquist 1985, Hualde 1989, Vago 1988; Varela García (1990); among others) and in other Romance languages, such as Portuguese (Bisol 1989) and Italian (Maiden 1991). Vowel raising has also been observed in Mexico (Parodi et al. 1997) and in the southwestern region of San Juan de la Maguana in the Dominican Republic (Personal Communication with R. Núñez Cedeño). Puerto Rican

Spanish (as well as other Spanish dialects in the Americas) shares many characteristics with dialects spoken in Cantabria, Canary Islands, Galicia and Mallorca in Spain (Álvarez Nazario 1990). Heríquez Ureña (1921) concludes that Puerto Rican Spanish inherited most of its linguistic characteristics from Andalusian Spanish. However, Navarro Tomás (1948:196) rejects the belief that peninsular dialects are solely responsible for the linguistic variation in Puerto Rico by saying:

“...no existe aún ninguna demostración convincente de que las modificaciones fonéticas en que se asemejan el andaluz y el hispanoamericano se produjeran en Andalucía antes que en América. La hipótesis más acertada parece ser la que considera tales cambios como resultado de una evolución que fue operándose de manera coincidente y simultánea en los dos campos mencionados”²

It might be common to associate high vowel features with the dialects in the north and west of Spain, but to say that vowel raising in the coffee zone of Puerto Rico is a relic feature inherited from Spain is to say that this dialect does not have the capacity to evolve on its own like any other linguistic system. Portuguese, Italian and most peninsular Spanish dialects have vowel harmony processes triggered by the final raised vowel. The results of this study do not show evidence of metaphony in the coffee zone of Puerto Rico.

3. Mobility and the Coffee Zone’s Community

Historically, coffee farming has been closely associated with the social, ecological and economic stability of this mountainous zone of Puerto Rico (Álvarez Nazario 1990). Spanish immigrants first brought coffee to the island in 1736, but it remained secondary to sugar cane production for most of the 18th century. Sugar cane plantations attracted African slavery, but new slave regulations during the early 19th century created a shortage of agricultural labor. Another added problem for the sugar cane industry was that immigrants did not want to work lands that were not their own. However, the *Cédula de Gracias* of 1815 and Europe’s internal events during this time attracted newcomers with the double incentives of political asylum and land ownership.

Even though Puerto Rico’s agrarian population came mainly from Canary Islands, Mallorca and Galicia, Napoleon’s Revolution also forced a migration of residents from the French Mediterranean island of Corsica into the island. French immigrants quickly realized that in order to farm and survive they would have to go to the highlands, for all the valleys were taken by Spaniards’ sugar cane *haciendas*³. By 1890, coffee crops dominated the mountainous interior commonly know as the *Cordillera Central*, and the towns of Maricao, Las Marías, Lares, Adjuntas, Jayuya, Utuado, San Sebastián, and Moca became the Coffee Zone of Puerto Rico. The area became a melting pot of European cultures and languages different from the costal towns of the island. See Cifre De Loubriel (1964) for more information. Figure 1 shows the municipalities composing the coffee zone.

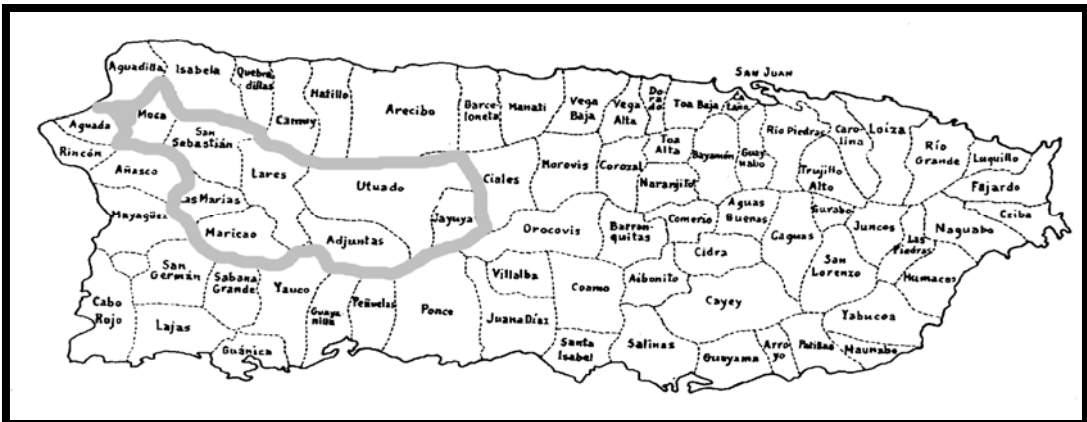


Figure 1. Map of Puerto Rico’s Coffee Zone

Worldwide, coffee is superseded only by petroleum as the most profitable commodity in terms of dollars traded (Wall Street Journal 03-21-05). However, the status of coffee as the “Puerto Rican Black Gold” is long gone and the industry is slowly dying. Puerto Rico has a population of 4 million, but the Association of Farming Development reports that only 9,000 people are involved in coffee picking. Labor costs are too high compared to other coffee producers such as Brazil, Colombia and Vietnam (Wall Street Journal 03-21-05). *Hacienda* owners in Puerto Rico pay \$4.00 for an *almud*,⁴ or 28 pounds of picked coffee, while other countries producing coffee pay an average of 50 cents or less for the same amount of coffee. Therefore, Puerto Rican coffee cannot compete in the international market and it remains local contributing up to 37 millions dollars to the island’s economy every year. High production costs, lack of international marketing and minimal labor force are gradually pushing Puerto Rico’s coffee industry towards extinction. People from the coffee zone are moving to other costal areas either to work in factories or to study in urban universities in order to earn a professional degree.

According to Chambers (2003:73) “Mobility causes people to speak and sound more like people from other places.” Puerto Rico’s geographical space is small, but the island’s topography of 60% mountains had isolated rural communities from the fast pace of costal urban societies for many decades and this isolation contributes a great deal to the island’s linguistic diversity. Rural isolation is now a thing of the past. New highways and roads connect the countryside with cities and well developed industrialized areas. Generations that in the past would not have had access to higher education are willing to move freely in any direction, from the countryside to the city and vice versa. People from rural areas, like the coffee zone, need to move to costal towns in order to study in major colleges and universities. Al-Wer (1997) argues that pursuing higher education in the Arab world has changed some speakers’ native dialects and social networks. Speakers from different linguistic backgrounds adopt the standard of that particular city where they come to study. On the other hand, people that stay within the same region performing the same type of work and social routines have their own particular linguistic system. Eckert’s (1989) study of a high school in Detroit shows how students signaled their social memberships and group hierarchy by their linguistic means. Britain (2002: 618) also mentions that “there will be local outcomes determined by local circumstances.” People who move out of the coffee zone for education or occupations other than agriculture may move up in the social scale. Those who continue working in the coffee fields tend to have lower incomes and social status.

4. Sampling Procedures and Methodology

My main concern when entering the community was to be dissociated from the image of an outsider and to be accepted as a friend. In order to make the interviewees more comfortable, I pointed out the fact that I was Puerto Rican and that I grew up on a farm. In a way, I became part of their community by living and picking coffee in the *haciendas* for a period of time. I was neither a stranger nor a native; I was just like Boissevan (1974) mentions “a second order network contact.”

I followed established sociolinguistic research techniques similar to the ones used in Labov (1966), Milroy (1987) and Eckert (1998). First, I became familiar with the coffee zone’s community at large through observation. Second, I performed sociolinguistic interviews with individuals and small groups who belonged to the community yet represented different age groups and backgrounds. The interviews were audiotaped following the type of questions developed by Labov (1966). Topics of the conversations included, but were not limited to: Family, language, hurricanes, favorite things and friends. A total of 69 participants were interviewed: 29 females and 40 males. There are more males than females because workers in the coffee industry are predominantly males. The age groups and the sample size of the study are as follows: Children (5-12 years old) 3 females and 2 males, Teenagers (13-19 years old) 3 females and 10 males, Young Adults (20-35 years old) 5 females and 9 males, Adults (36-55 years old) 12 females and 14 males, and Elders (56-98 years old) 6 females and 5 males. Children, adolescents, young adults, adults and elders were included to observe the patterns of vowel raising across generations.

The interviews included casual conversations of approximately 30 minutes to an hour on topics that were familiar to the participants, such as childrearing, farming techniques and hurricanes. All interviews were transcribed impressionistically using phonetic symbols. No significant differences were found in vowel raising between careful or casual speech. Labov (1994: 157) states that “the

major part of the interview, no matter how casual it may seem on first inspection, must be classed as careful speech.” In this study, tokens from the last 15 minutes of the interview were analyzed because they represent the type of speech that one might find naturally in the coffee zone.

Eckert (2000:86) states that there are inherent problems in the use of impressionistic transcriptions because the transcriber’s expectations can affect what is perceived in the collected interviews. In order to compensate for any problems that the impressionistic transcriptions may have, I subjected the interviews to instrumental measurements using Pratt. Table 1 shows the respective formant values of tokens *pasteles*⁵ and *haciendo* ‘making’ as spoken by a female coffee picker.

Table 1. Formant Values

Tokens	Phonetic Transcription	F1 values	F2 values	Vowel Raising
1) pasteles	1a) [pahtéleh]	326.13 Hz	2035.3 Hz	no
	1b) [pahtélih]	225.36 Hz	2640.6 Hz	yes
2) haciendo	2a) [asjéndo]	344.39 Hz	943 Hz	no
	2b) [asjéndu]	182.6 Hz	785.47 Hz	yes

According to Quilis (1981) the formant values in example 1a) are within the frequency range of an unchanged mid front vowel [e], but the values in 1b) belong to a high front vowel [i]. Also, the second token in table 1 presents that the final mid back vowel alternates with a high back vowel [u]. The spectrographic analysis shows that vowel raising occurs from /e/>[i] and from /o/>[u] when the final mid vowels are unstressed open syllables. The acoustic analysis does not indicate vowel harmony processes of tenseness and laxness found in the north and west mountainous regions of Spain.

5. Overall Results

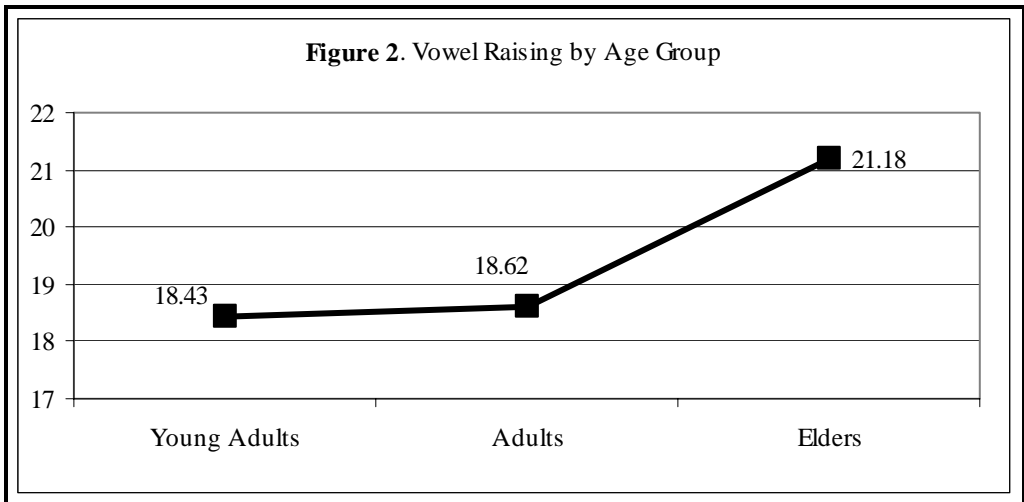
Mobility is an added index to the socioeconomic status in the coffee zone. Children and teenagers depend on their parents for transportation. Therefore, for the purpose of this article, these two categories were excluded from the analysis. From a total of 51,000 tokens, 986 were raised: 427 from /e/>[i] and 559 from /o/>[u]. Table 2 shows the frequencies and the percentages of raised and non-raised tokens of each group.

Table 2. Vowel Raising Results

Age Groups	/e/>[i]	Not raised	Total	/o/>[u]	Not raised	Total
Young Adults (n=14)	109 15.6%	591	700	149 21.9%	551	700
Adults (n=26)	219 16.8%	1081	1300	265 20.3%	1035	1300
Elders (n=11)	99 18.0%	451	550	145 26.4%	405	550

A chi-square test indicates no significant difference of vowel raising frequencies between Young Adults and Adults. However, there is a chi-square value of 5.41, $p < 0.025$ between Young Adults and Elders and a chi-square value of 6.22, $p < 0.025$ between Adults and Elders indicating that there are

significant differences between the ages of 20 to 55 and Elders. Figure 2 shows the percentages of vowel raising across the discussed age groups.



6. Mobility and its Effects on Vowel Raising

Moving out of the countryside translates into more opportunities to study and earn a college degree which ultimately leads to a better paying job. People who had traveled out of the countryside tend to lose the feature while people with less mobility had more instances of vowel raising. Participants who were born and raised in the coffee zone and never moved out of the area received the category of “Never Out” and those who moved out to study or work outside the coffee zone for more than two years were labeled “Out.” Table 3 shows the frequencies and percentages of vowel raising across age groups for the two different mobility patterns.

Table 3. Vowel Raising Frequencies by Mobility

Age groups	Mobility	Raised Tokens	Non-Raised	Total
Young Adults (n=14)	Out %	139 17.9%	661	800
	Never Out %	119 19.8%	481	600
Adults (n=26)	Out %	151 12.58%	1049	1200
	Never Out %	333 23.79%	1067	1400
Elders (n=11)	Out %	56 14.0%	344	400
	Never Out %	188 26.9%	512	700

The degree of difference between vowel raising frequencies among “Never Out” and “Out” is highly significant with a chi-square value of 64.74, $p < 0.001$.

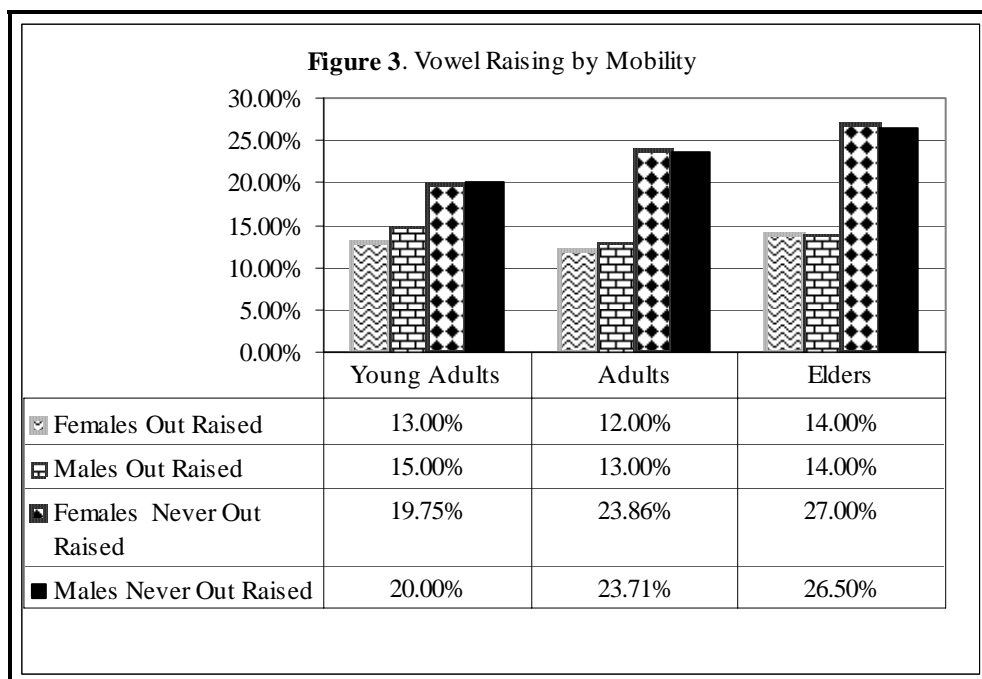
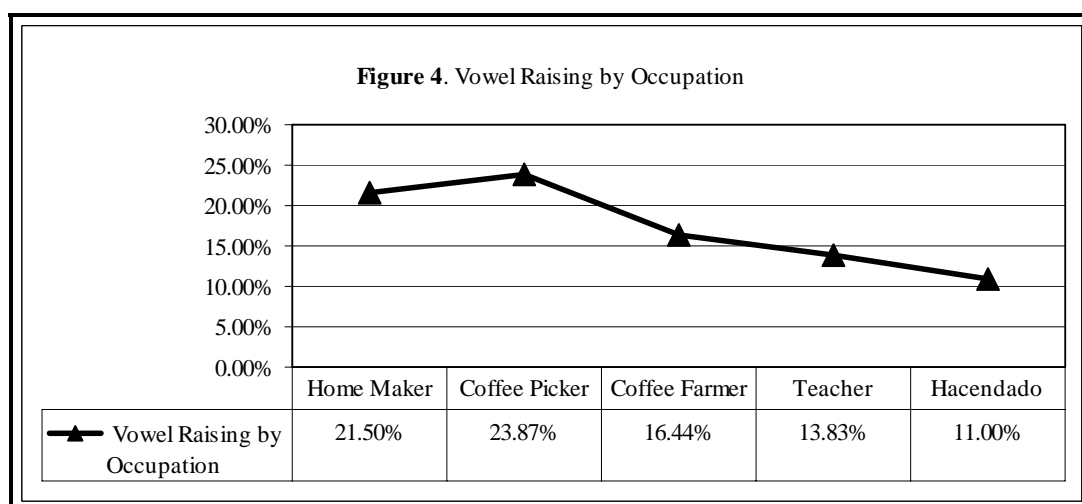


Figure 3 shows the proportion of vowel raising by gender, age group and mobility. People who have never been out of the coffee zone have more vowel raising than those who have been out of the countryside. Figure 3 indicates that both, males and females who stay local have more vowel raising than those who lived outside the coffee zone. Labov (1994) determined that women tend to lead sound changes that are not stigmatized. Women who have lived in urban areas understand that vowel raising is an stigmatized feature and this explains their decreased vowel raising frequencies compared to men who have been out.

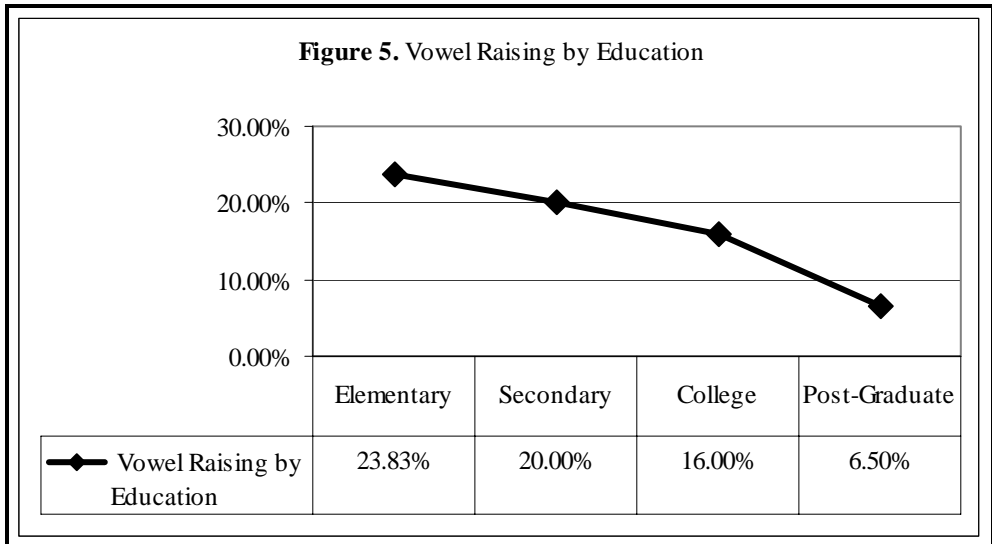
Figure 3 also shows that vowel raising increases across generations. Young women in the category of Never Out have an average of 19.75 raised tokens for every 100 words, while elder women in the same category have 26.5 raised tokens. Thorne (1993:51) found that “where age separation is present, gender separation is more likely to occur.” Elder women are mostly homemakers and coffee pickers and these are the occupational categories with more vowel raising as shown in figure 4 below.



*Hacendados*⁶ have the lowest rates of vowel raising for both females and males. Most *hacendados* have post graduate degrees and often go to cities regularly to do business transactions. Whereas,

teachers and coffee farmers have lived outside the coffee zone to study or work for more than two years, but do not travel outside as often as *hacendados*. Therefore, they tend to have higher vowel raising than *hacendados*.

Figure 5 shows the frequencies of vowel raising by the subject's education. Elementary education is from kindergarten to eighth grade, Secondary education is from ninth grade to twelfth grade, College is two years of higher education up to bachelor's degree and Post-Graduate is master's degree or more.



Subjects with elementary education have more vowel raising compared to those with higher education. Speakers with elementary or secondary education are most likely to work in the coffee fields, and those with higher education have more chances to work in jobs other than agriculture. The presented results show that the occupation and education of the coffee zone's community correlates with the geographical mobility of each subject.

7. Conclusion

Vowel raising is stigmatized outside the coffee zone, but internally it is not viewed as a negative feature. People who move out tend to modify their speech to reduce the instances of vowel raising. Their speech starts to resemble more like the dialects of costal urban areas.

The overall results presented in this article are similar to those found in Holmquist's (2005, 2003, 2001 and 1998) studies in the community of Castañer (located between Lares and Adjuntas). This article presented that vowel raising in the coffee zone is associated with its topographic isolation and the community's autonomous industry. These two factors have helped this dialect to evolve on its own without the influences of the surrounding urban areas.

Labov (2001: 311) states that "every change must show a decline among younger speakers to some extent." The data suggests that there is no significant difference in vowel raising between males and females of the same age group, but there is a significant difference across age groups. Vowel raising is slowly disappearing among younger generations.

Notes

- ¹ Computer software used to analyze sound that can be downloaded from www.fon.hum.uva.nl/pratt/ for free.
- ² "...there still no convincing demonstration that the phonetic modifications in which Andalucian and Hispanic American Spanish resemble were produced in Andalucía before it was produced in America. The most fitted hypothesis seems like it is the one that considers these changes as a result of an evolution that was developing as a coincidence and simultaneously in both of the mentioned fields."
- ³ *Haciendas* are vast regions for agricultural purposes, usually own by a single person or by a single family.
- ⁴ *Almud* is the term use by the coffee industry to indicate 28 pounds of picked mature coffee berries.
- ⁵ A traditional Caribbean Christmas dish made from green banana dough and other tropical roots, stuffed with meat and steamed in banana leaves.
- ⁶ *Hacendados* usually inherit the coffee haciendas as a family legacy.

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