Linguistica ONLINE. Issue 21. Published: May 29, 2018
http://www.phil.muni.cz/linguistica/art/mota/mot-001.pdf
ISSN 1801-5336

THE /l/ IN THE OCCITAN SPOKEN IN VAL D'ARAN (ARANESE): IS IT CLEAR OR DARK?[*]

Sidney Martin Mota (Official School of Languages in Tarragona (EOI), Spain, smart47@xtex.cat)

Abstract: The /l/ in Aranese has been characterized as a clear /l/ similar to the /l/ in French and much less velarized than the Catalan /l/ (Coromines 1991: 39). However, no empirical analysis to prove the impressionistic observations found in Coromines (1991) has ever been performed to the author's knowledge. However, this study has empirically confirmed that the Aranese /l/ is a clear /l/, by means of an acoustic analysis of 200 words containing the /l/ and collected from spontaneous speech.

Keywords: laterals, clear and dark /l/, Aranese, acoustic phonetics

1. Introduction

The /l/ in Aranese

Aranese is the Occitan spoken in Val d'Aran, which is a northern-side Pyrenees valley, bordering France in the north, the autonomous community of Aragon (Spain) in the west and the autonomous community of Catalonia (Spain) in the South and East. The /l/ in Aranese can be found at word initial (*lèu*) or syllable initial position (*alavetz*) but preconsonantal and syllable final /l/ vocalize into a velar approximant. For instance, *sau, cèu, naut* and *fauta* (Coromines, 1991). Aranese /l/ is phonetically represented as [l] (Carrera, 2006). The other lateral in Aranese is [ʎ], which is orthographically represented as "lh" in words such as "*lhet, palha, calhau, vielh*" (Carrera, 2006).

The /l/ in Aranese has been characterized as a clear /l/ similar to the /l/ in French and much less velarized than the Catalan /l/ (Coromines 1991:39). However, there is no empirical analysis to prove the impressionistic observations found in Coromines (1991). According to him, the /l/ in Aranese must have been heavily velarized for /l/ to become vocalized in /w/ as in sal < saw. L-vocalization namely affected final and preconsonantal /l/s. Interestingly, when the /l/ was vocalized in these contexts, the change stopped spreading to other remaining contexts since Aranese speakers may have wanted to block the sound change into /w/ by articulating a clear /l/. The goal of the study is to empirically test whether the Aranese /l/ is a clear /l/ in order to confirm Coromines (1991), which has never been done to the author's knowledge. Thus, here lies the importance of this paper to Aranese phonetics, apart from the fact that it is the first time, to the author's knowledge, that the acoustics of Aranese /l/ has been studied empirically.

[*] Previously unpublished. Peer-reviewed before publication. [Editor's note]

Clear vs Dark /l/

Velarity in laterals can be described as a continuum with dark /l/, heavily velarized, at one end and with clear /l/, not velarized, at the other end. Thus, /l/s from different languages can equally be classified as languages with velarized or non-velarized /l/s and between. For instance, Catalan /l/ has been characterized as an alveolar velarized lateral or dark /l/. Articulatorily speaking, either one or both sides of the tongue are not in contact with the palate whilst the air is let out through the sides imperceptibly and the tongue dorsum is raised towards the soft palate. In addition, the tongue tip is touching the alveolar region. Interestingly, however, /l/ in the Catalan spoken in Valencia, known as Valencian, shows less velarity than in other varieties like Eastern Catalan or Majorcan as a consequence of a low tongue dorsum height. Thus, the /l/ in the Catalan spoken in Valencia would be described as a clear /l/ (Recasens 2005). One can therefore find differences in velarity even between varieties within the same language. At the clear /l/ end of the continuum, one can also find other languages such as French and Castillian, whose /l/ has traditionally been described as clear (Recasens 2005), characterized by the tongue tip touching the alveolar region and a low tongue dorsum height.

The articulatory configuration of the laterals mentioned above can be translated into acoustic information in the following manner. Formant frequencies for the velarized /l/ in Catalan are F1: 250–500Hz and F2: 800–1000Hz (highly velarized) and 1300–1500Hz (for a less velarized or clear /l/) (Solà & Rigau 2008). On the other hand, /l/ in Castillian are F1: 328Hz and F2: 1561Hz (Quilis 1979) and in French F1: 379Hz and F2: 1656Hz (Chafcouloff 1980). F1 and F2 values may vary due to phonetic context (Recasens 2005). For instance, F1 is 350–450Hz and F2 is 800–1050Hz in Catalan word-final /l/ whereas F1 is 250–350Hz and F2 is 900–1250Hz in Catalan word-initial /l/. However, one can see that the /l/ still falls in the dark /l/ side of the continuum. Castillian Spanish shows a similar behaviour for its clear /l/: F1 327Hz and F2 1587Hz in word-final position and F1 329Hz and F2 1567Hz in word-initial position.

Recasens (2005) suggested the existence of three groups of languages based on the formant makeup of their /l/ as a function of syllable position. Group A has a dark /l/ with a very low F2 at around the 1000Hz mark or even lower for both /l/s in syllable initial and final position (American English, Polish, Albanian and Russian). In group B (Southern British English and Eastern Catalan) the dark /l/ varies as a function of syllable position with initial /l/ showing a higher F2 (average of 1075Hz) than in final position (average of 925Hz). However, the F2 is still at around the 1000Hz mark. Finally, Group C (German, French, Spanish or Castillian and Italian) shows a clear variety of /l/ whose F1 is at around the 300 Hz mark, similarly to Groups A and B, but F2 is at around the 1500Hz mark, which is the acoustic trait that will be used to classify the Aranese /l/.

The goal of this paper is to analyze Aranese /l/ acoustically and in spontaneous speech so as to test Coromines' impressionistic observations regarding whether the Aranese lateral can be classified as a clear /l/. Recasens (2005)'s description of a clear /l/ will be used in order to decide whether the Aranese /l/ has a formant makeup akin to the clear /l/, whose F1 is at around the 300Hz mark and F2 is at around the1500Hz mark.

Hypothesis

H: The /l/ in Aranese will show similar F1 and F2 values to a clear /l/, based on Recasens (2005)'s acoustic and empirical description of a clear /l/, whose F1 is at around the 300Hz mark and F2 is at around the1500Hz mark.

2. Method

Linguistic material

Recordings from *Meddia Aranès*, which is a radio programme in Aranese, were used in order to collect samples of /l/ in Aranese. All of the recordings are interviews in Aranese and only the interviewee has been analysed. In addition, the first ten words containing /l/ were tagged and repetitions were excluded so that all the words were first-time utterances. 200 tokens were analyzed.

Subjects

20 subjects were selected: 14 male speakers and 6 female speakers, all of whom were adults. Other socio-demographic information has not been collected since no contact details of the interviewees were provided.

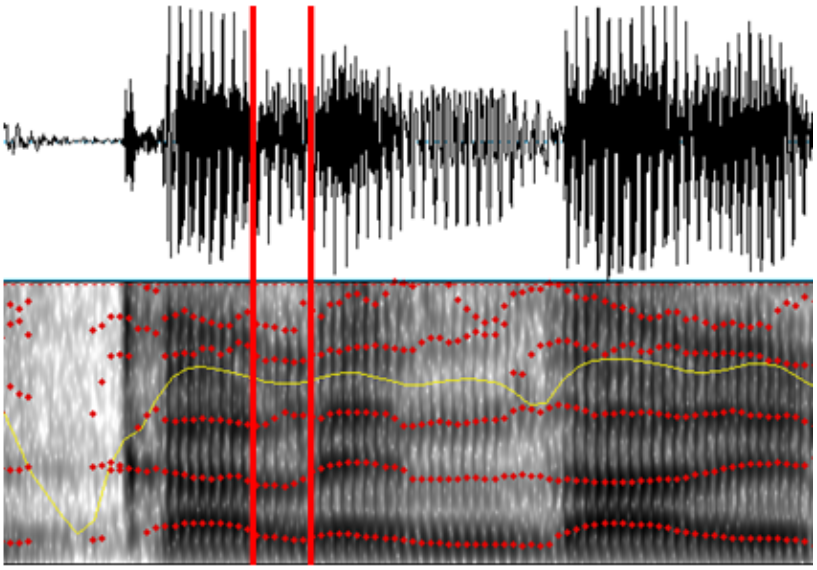

Figure 1: Acoustic analysis of the /l/ in "calendari"; the two red vertical lines delimiting the /l/ in the word (speaker 17).

Acoustic analysis

The analysis was carried out using Praat 6.0.12 (Figure 1). Once the /l/ was auditorily identified in the spectrogram as well as manually delimited, its duration, F1 and F2 at midpoint were then automatically extracted by means of a script. After that, Statistica 8.0 was used to

analyze the data and produce the corresponding graphs as well as descriptive statistical analysis. Microsoft Excel 2003 was used in order to produce the graph for Figure 3.

3. Results

A total of 200 target /l/s were analysed. Mean F1 is 417.30Hz and mean F2 is 1606.13Hz (see Table 1). Table 2 and Figure 2 show mean values for each of the 20 speakers who participated in the study. All of the F2 values fall well above the 1000 Hz, which is within the clear /l/ rather than the dark /l/ domain (see Table 2 and Figure 2) according to Recasens (2015)'s description of a clear /l/.

	N	Mean	Std. Dev.
F1	200	417.296	114.8287
F2	200	1606.132	304.6290

Table 1: Mean values for F1 and F2 (Hz)

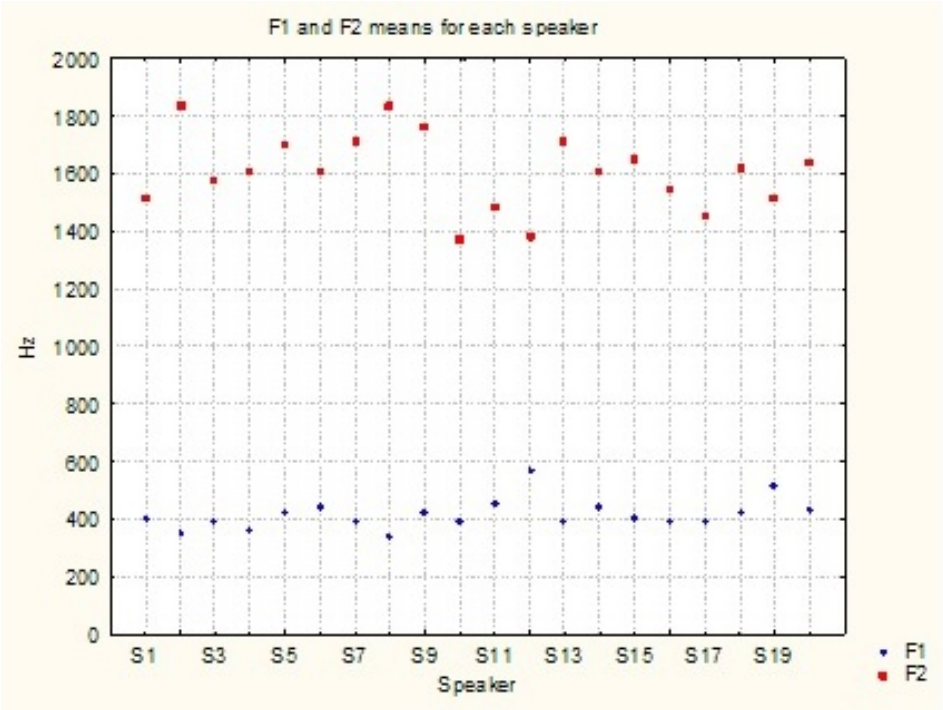

Figure 2: Mean values for F1 and F2 (Hz) for each speaker.

One-way ANOVA yields a significant difference between subjects (F1: $F(1,19) = 2.398$, $p < 0.05$ and F2: $F(1,19) = 2.098$. $p < 0.05$). The speakers' Sex was controlled for. Median F1 values in female vs male were 407.97Hz and 403.92 Hz; the distribution in the two groups did not differ significantly (Mann-Whitney U = 36.5, female = 6, male =14, $p > 0.05$). Median F2 values in female vs male were 1673.44 Hz and 1577.21 Hz; however, the distribution in the two groups did differ here significantly (Mann-Whitney U = 18, female = 6, male =14, $p < 0.05$), which might indicate that speaker variability may be due to physiological differences in the vocal tract of men and women, which in turn may affect the acoustic pattern of

/l/-articulation. Speakers 10, 11 and 12, all of whom are male, show lower F2 values than the rest of the subjects. As we have seen, one-way ANOVA yields a significant difference between subjects, but fails to do so when speakers 10, 11 and 12 are removed from the test (F1: $F(1,16) = 1.442$, $p>.05$ and F2: $F(1,16) = 1.304$. $p>.05$). Such results show that individual differences do exist. However, the /l/ in speakers 10, 11 and 12 is still within the range of a clear /l/ as described by Recasens (2005), which is F1 at around the 300Hz mark and F2 at around the 1500Hz mark and well above the F2 for dark /l/, whose F2 is at around 1000Hz.

Speaker	F1 (Mean)	F2 (Mean)	Speaker	F1 (Mean)	F2 (Mean)
S1 (male)	406.0900	1513.130	S11 (male)	450.5300	1484.650
S2 (female)	349.0500	1836.490	S12 (male)	572.7900	1379.870
S3 (female)	396.4900	1574.060	S13 (female)	393.5800	1711.590
S4 (male)	366.6600	1605.560	S14 (male)	442.5800	1604.950
S5 (male)	422.3300	1706.680	S15 (male)	401.7500	1645.770
S6 (male)	442.5800	1604.950	S16 (male)	391.4500	1549.470
S7 (male)	393.5800	1711.590	S17 (male)	396.5000	1456.740
S8 (male)	341.6000	1836.490	S18 (female)	423.3700	1617.410
S9 (female)	419.4500	1763.910	S19 (male)	513.8500	1511.870
S10 (male)	388.5600	1372.150	S20 (female)	433.1300	1635.300

Table 2: Mean values for F1 and F2 (Hz) for each speaker.

4. Discussion and Conclusions

As a reminder, our hypothesis is that the /l/ in Aranese will show similar F1 and F2 values to a clear /l/, which has been confirmed. The results are in line with the observations made by Coromines (1991), who did not carry out an acoustic analysis to test his auditory impressions, but we did. The /l/ in Aranese (mean F1 is 417.30Hz and mean F2 is 1606.13Hz) is closer to that of Spanish or French rather than the Eastern dialect of Catalan (Recasens 2005) as can be seen in Figure 3. The F1 in the four varieties shows similar values. However, the F2 is lower in Eastern Catalan, which is an indirect cue to tongue dorsum raising whereas the F2 in the other varieties is notably higher than in Eastern Catalan. The acoustic makeup of Aranese /l/ is clearly that of a clear /l/, matching French and Castillian Spanish. It could be safe to say that the Aranese /l/, although indirectly observed, also has a similar articulatory configuration to that of Castillian Spanish and French. Recasens (2005)'s description of a clear /l/ fits well with the acoustic pattern of the Aranese /l/, which could thus be placed in Recasens (2005)'s Group C for the languages whose /l/ is clear.

Since Aranese is the Occitan spoken in the Val d'Aran, it would be interesting to compare such results with other varieties in Occitan so as to study how laterals vary across different varieties of the one same language, similarly to what we see in Catalan (Reacasens, 2005). Unfortunately, the reasons why laterals are clear in Aranese are out of the scope of the study, but Coromines (1991) may be right when he suggests that Aranese /l/ changed from a dark to a clear /l/ since Aranese speakers may have wanted to block the sound change into /w/ by articulating a clear /l/. However, one cannot confirm any of this with the kind of data in this study.

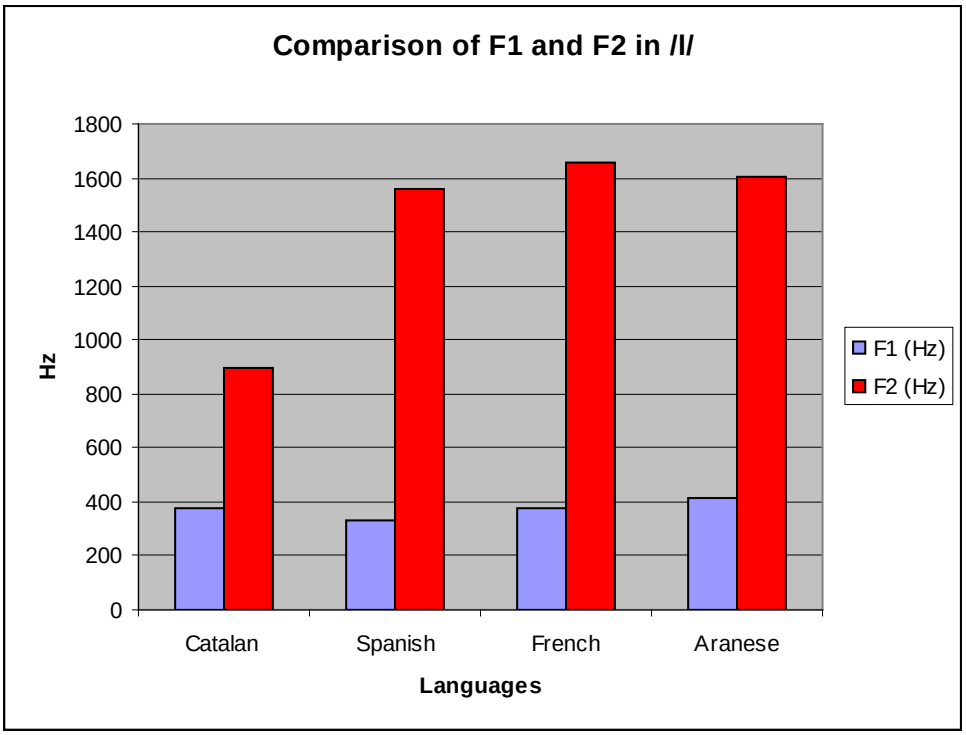

Figure 3: Bar graph comparing F1 (Hz) and F2 (Hz) in /l/ in Catalan (Eastern variety), Castillian Spanish (Quilis 1979), French (Chafcouloff 1980) and Aranese (Occitan spoken in the Val d'Aran). The F1 and F2 in Eastern Catalan is the average between the two values given in Solà & Rigau (2008)

Some other observations about the data are in order. There seems to be a significant effect of biological sex within the Aranese /l/ we have analyzed. More specifically, in the F2 values, which may be due to physiological differences based on the biological sex of the speakers or even on the articulatory configuration of the lateral. Articulatory techniques would be needed in order to confirm the previous observations, which is out of the scope of this paper. Despite the differences, the F2 values of all the speakers fall within the range of a clear /l/, which is F1 at around the 300Hz mark and F2 around the 1500Hz mark (Recasens, 2005). Speakers 10, 11 and 12 yielded a different formant pattern, though still within the range of a clear /l/ and well away from the dark-/l/ value for F2, which is at around the 900Hz mark (e.g. Eastern Catalan). Such observations may be evidence of the gradient nature of velarity already described in Recasens (2005). Clear and dark /l/ is not a binary trait but rather a gradient property, which is why speakers 10, 11 and 12 can be seen as examples of gradiency between the clear and dark continuum.

One should be reminded that the goal of the paper was to test whether Coromines (1991)'s impressionistic observations were in line with the exploratory empirical data collected here. A limitation of the study is that the number of subjects should be higher and more balanced between male and female. In addition, articulatory analyses of the Aranese laterals (EMA or EPG) would help us learn more about the articulatory nature of the Aranese /l/.

The study is a first exploratory step of Aranese /l/, which has raised more questions and opened up new paths to broaden our knowledge about an empirically and phonetically understudied variety of Occitan. It is critical that phonetically understudied languages such as Aranese receive more attention from the scientific community. I hope that this study will

encourage others to empirically investigate Aranese, the Occitan spoken in Val d'Aran, in the heart of the Pyrenees.

References

ALIBÈRT, L. 2000. *Gramatica Occitana*. Barcelona, Tolosa: Institut d'Estudis Occitans.

CARRERA, A. 2006. *Gramatica aranesa*. Lleida: Pagès Editors.

CHAFCOULOFF, M. 1980. "Les caractéristiques acoustiques de /j,y,w,l,r/ en français". *Travaux de l'Institut de Phonétique d'Aix* 7, 7–56.

COROMINES, J. 1991. *El parlar de la Vall d'Aran. Gramàtica, diccionari i estudis lexicals sobre el gascó*. Barcelona: Curial Edicions Catalanes.

QUILIS, A. – ESGUEVA, M. – GUTIÉRREZ ARAUS, M. L. – CANTARERO, M. 1979. "Características acústicas de las consonantes laterales españolas". *Lingüística Española Actual* 1(2), 233–343.

RECASENS, D. – ESPINOSA, A. 2005. "Articulatory, positional and coarticulatory characteristics for clear and dark /l/: evidence from two Catalan dialects". *Journal of the International Phonetic Association* 35(1): 1–25.

SOLÀ, J. – RIGAU, G. 2008. *Gramàtica del català contemporani. Introducció Fonètica fonologia Morfologia. (vol. 1)*. Barcelona: Editorial Empúries.