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AN ACOUSTIC DESCRIPTION OF ARAGONESE SPANISH

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Abstract

This paper aims to offer a comprehensive acoustic description of Aragonese Spanish. The analysis is based on spoken samples from 25 speakers of Aragonese Spanish. The current study includes an analysis of the phonetic characteristics of vowel, including diphthongs and triphthongs, of consonants and of prosody. Furthermore, the present paper also analyses the allophones of Aragonese Spanish and some phonetic processes, such as spirantization of voiced stops in intervocalic position and vowel nasalization. In the final section, the reader can find a phonetic and phonological transcription of a text. The present paper aims to provide detailed account of the phonetic structure of Aragonese Spanish in order to contribute to our understanding of phonetic variation in Spanish.

Keywords: Aragonese Spanish, phonetics, phonology, acoustic analysis

UNA DESCRIPCIÓ ACÚSTICA DE L'ESPANYOL D'ARAGÓ

Resum

L'objectiu d'aquest article és oferir una descripció acústica completa de l'espanyol aragonès. L'anàlisi es basa en mostres parlades de 25 parlants. L'estudi actual inclou una anàlisi de les característiques fonètiques del vocalisme de l'espanyol aragonès, incloent-hi diftongs i triftongs, del consonantisme i de la prosòdia. A més, el també s'analitzen els al·lòfons i alguns processos fònics, com ara l'espirantització d'oclusives sonores en posició intervocàlica i la nasalització vocàlica. En el darrer apartat, el lector pot trobar una transcripció fonètica i fonològica d'un text. Aquest treball pretén donar una explicació detallada de l'estructura fonètica de l'espanyol aragonès per contribuir a la comprensió de la variació fonètica en espanyol.

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Paraules clau: espanyol d'Aragó, fonètica, fonologia, anàlisi acústica

DESCRIPCIÓN ACÚSTICA DEL ESPAÑOL DE ARAGÓN

Resumen

Este artículo pretende ofrecer un análisis acústico detallado del español hablado en Aragón. Con este fin, se ha analizado el habla de 25 hablantes de Aragón. El presente estudio incluye un análisis de las características fonéticas de las vocales –incluyendo diptongos y triptongos–, de las consonantes, y de la prosodia. Se incluyen también análisis de distintos alófonos y fenómenos fonéticos, como puedan ser la espirantización de las oclusivas sonoras en posición intervocálica y la nasalización de vocales. Finalmente, se ofrece una transcripción fonético-fonológica de un pasaje. El objetivo de este trabajo es ofrecer una visión completa de la estructura fonética del español hablado en Aragón con el fin de contribuir al conocimiento sobre variación fonética en español.

Palabras clave: español de Aragón, fonética, fonología, análisis acústico

1. Introduction

Aragonese Spanish is a variety of Spanish (ISO 639-3: spa) spoken in the northeastern part of the Iberian Peninsula, in Aragón, an autonomous region which includes the provinces of Huesca, Zaragoza and Teruel (Figure 1 left: dark grey). Aragón borders with bilingual Catalan and Spanish speaking regions to the east (the autonomous regions of Catalonia and Valencia), with a bilingual Basque and Spanish speaking region to the northwest (Navarra), with monolingual Spanish speaking regions to the west and southwest, and with France to the north. Aragonese Spanish is the mother tongue of most of Aragón's population; however, this autonomous region is officially considered trilingual. Some varieties of Catalan (specifically Western Catalan [glottocode: cata1290]) are spoken in the eastern part of the three provinces of Aragón (Giralt 2012, 2019) (Figure 1 right: zona B). Medieval Aragonese, a Romance language traditionally spoken in Aragón, was widely spoken in the Middle Ages but its number of speakers shrank as Spanish spread throughout the region. Today, just some varieties of Aragonese (ISO 639-3: arg), survive in the mountainous area of Huesca's Pyrenees (Frago 2007, Enguita 2019) (Figure 1 right: zona C). It is widely accepted that there are also some transitional varieties between Aragonese and Catalan with its own entity (Saura 2001, 2003, 2004) (Figure 1 right: zona D).

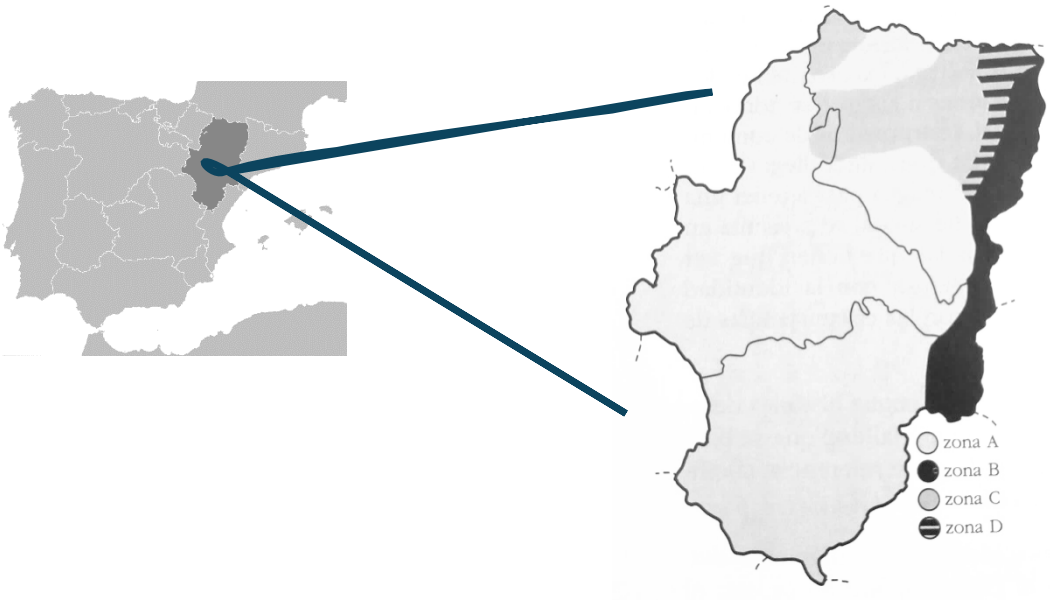


Figure 1. Left: map of Spain (Iberian Peninsula); right: detailed map of Aragón with distribution of zones depending on spoken language (modified from Martín Zorraquino & Enguita 2000).

Despite Aragón being an official trilingual region, Aragonese Spanish is normally considered the mother tongue of the inhabitants of Aragón, although speakers in the north also speak Aragonese and those in the east also speak Catalan. According to the National Institute of Statistics (INE, for its acronym in Spanish) (INE 2020), the population of Aragón is 1,329,391. Reyes et al. (2017) claims that 55,513 people can speak Catalan in Aragón (4,2% of the population) and that 25,556 (1,9%) can speak Aragonese; 81,068 people in Aragón (6,1% of the population) are bilingual.

It is generally believed that the most noticeable difference between Aragonese Spanish and Castilian Spanish is regarding the pattern of intonation (Salvador 1987: 150-151); however, few studies have actually focused on acoustic analysis. Little attention has been given to the phonetic properties of Aragonese Spanish and the few works which deal with this variety of Spanish are of an impressionistic nature (Castañer, González & Simón 2005), lacking a detailed phonetic analysis. In each section of this article a bibliographical revision will be made if needed.

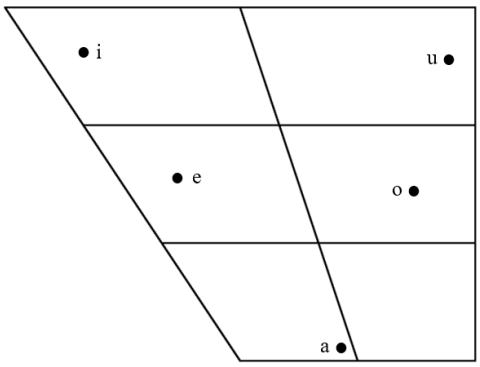
2. Mehodology

The description included in the present paper is based on recordings from 25 speakers of Aragonese Spanish (12 males and 13 females) from the cities and towns of Zaragoza (9), Huesca (6), Teruel (4), Alcañiz (5) (main city in the region called Bajo Aragón in the province of Teruel) and Tarazona (1) (at the west part of the province of Zaragoza). Speakers' ages range from 12 to 70 years. The transcription of the final passage is based on the reading of a 66-year-old male from Teruel. The data was collected by a mixture of readings, naming objects presented on a PowerPoint Presentation, and spontaneous conversation, since some local features of Aragonese Spanish are more prevalent in informal registers.

3. Acoustic description

3.1 Vowels

3.1.1 Monophthongs



For typographical convenience, the IPA symbol /a/ will be used instead of the central [a̟], which would be the appropriate one here. Likewise, our analysis shows that /o/ is pronounced as a slightly lower vowel than [o], closer to [ɔ]; however, we will use the IPA symbol /o/ for typographical convenience.

As in Castilian Spanish (Martínez-Celdrán et al. 2003), Aragonese Spanish has five vowel phonemes which may occur in any position and may be stressed or unstressed: /a/, /e/, /i/, /o/, /u/. Following Warren (2018), to reduce the impact of formant transitions, the average value of the formants was taken from a section of the vowel rather than from a particular point; the section chosen in this paper goes from 20% until 80% of each vowel. The measurements were taken from the vowels in isolation, which happen to be words in Spanish (Table 1). All settings were standard Praat (Boersma & Weenink 2020) with the exception of maximum formant (Hz), which was set at 5000 Hz for males and 5500 for females. The onset of the vowel was marked at the point where F2 and F3 displayed an abrupt increase in energy and the offset was marked at the point where F2 and F3 displayed a sudden reduction in energy. Segmentation was done manually but measurements were taken using a script written by the second author. These 288 vowels were pronounced by 10 speakers of Aragonese Spanish (five males and five females).

Vowel phoneme	**Example word**	**Gloss**	**Tokens**	**F1**	**F1 SD**	**F2**	**F2 SD**
/i/	*y*	‘and’	55	348	53.54	2422	310.72
/e/	*e*	‘and’ (before /i/)	55	498	44.75	2155	256.94
/a/	*a*	‘to’	64	867	115.16	1356	130.64
/o/	*o*	‘or’	57	580	62.94	938	88.58
/u/	*u*	‘or’ (before /o/)	57	387	62.47	785	86.22

Table 1. F1 and F2 of /i/, /e/, /a/, /o/ and /u/. Mean values taken from the 20% - 80% section of 288 tokens pronounced by 10 Aragonese Spanish speakers (five males and five females)

The distribution of Aragonese monophthongs across the vowel space are given in Figure 2.

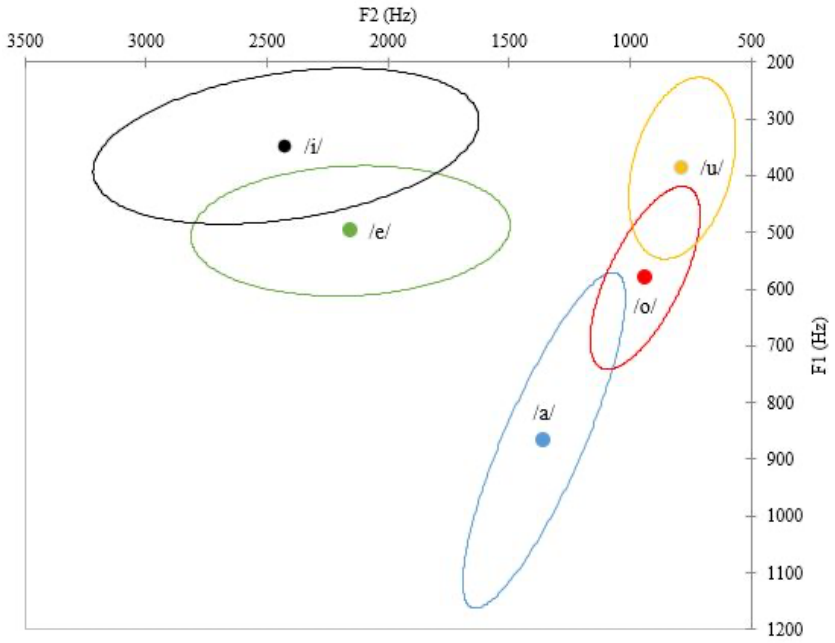


Figure 2. Monophthongs of Aragonese Spanish. Mean values (bold dots) and confidence ellipses for the 20% - 80% portion of 288 vowels taken from ten speakers (five males and five females).

Some authors have noted some durational differences between stressed and unstressed vowels in some varieties of Spanish, as in Las Palmas de Gran Canaria (Troya 2008-2009) or in Puerto Rico (Vaquero & Guerra de la Fuente 1992). However, any slight difference in length between stressed and unstressed vowel duration is phonetic and, given that these differences are typically very small, durational differences are not noted in the transcriptions.

Traditionally, in Aragonese Spanish, as in other varieties of Spanish, vowels are thought to become nasalized between two nasals or after a pause if they precede a nasal consonant (1). However, the reality is more complex.

(1)

mundo	[ˈmũn̪do]	‘world’
antena	[ãn̪ˈtena]	‘antenna’

In order to analyze nasality, the Earbud method was used (Stewart & Kohlberger 2017, Bruil & Stewart 2022). The data collection was carried out by placing an earbud

under a nostril of the speaker and the other earbud at the corner of the mouth, as described in Stewart & Kohlberger (2017). The earbuds were connected to a Zoom H2N recorder and used as small microphones; this allowed to capture data for the nasal and oral tracts.

Using the method described in Stewart & Kohlberger (2017: 55), information from the nasal and oral tracts was plotted against each other and the data is included in Figure 3. Since nasality is highest in low vowels and lowest in high vowels (Styler 2015: 12), it was decided to analyze nasality in /e/ in Aragonese Spanish.

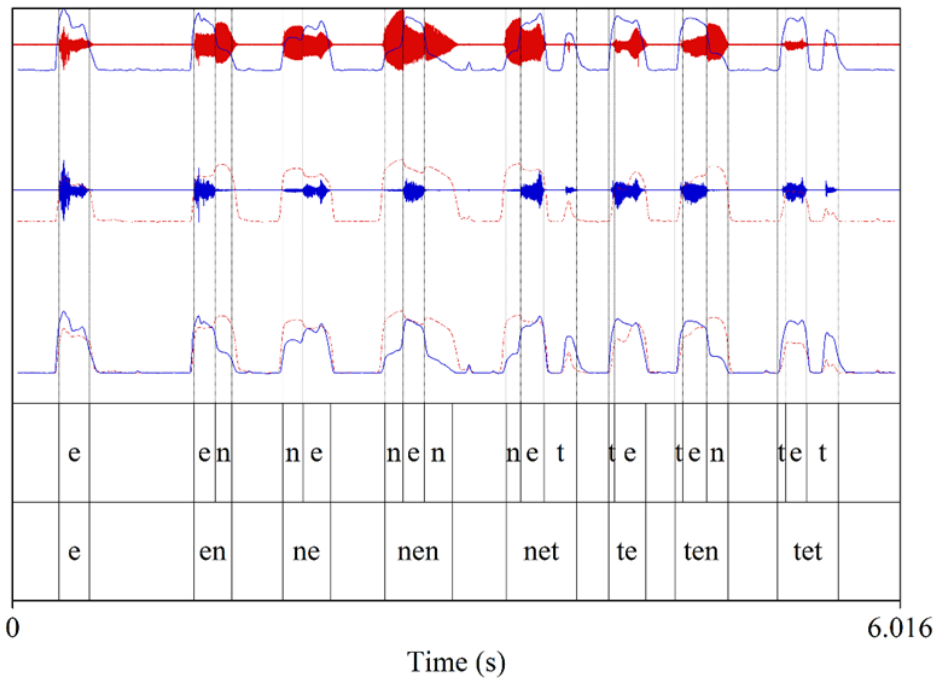


Figure 3. Waveform amplitude (Pa) and intensity (dB) for Aragonese Spanish /e/ in different phonetic contexts. The nasal waveform appears at the top (red) and the oral waveform at the bottom (blue). Intensity of the nasal tract is represented using a dashed line (red) and oral intensity is represented using a solid line (blue). The intensity of the nasal and oral tracts are superimposed at the bottom of the figure. Data taken from the speech of a female native speaker of Aragonese Spanish.

As Stewart & Kohlberger (2017) explain, a sustained increase in the nasal amplitude together with a decrease in oral amplitude corresponds to velum lowering,

which is typical of nasal consonants. Both tracts have similar values if they are both used to produce a sound.

As we can see from Figure 3, the nasality of /e/ has very similar values in /e/, /net/, /te/ and /tet/. Nasality increases slightly for /e/ in /en/, /ne/ and /ten/. Finally, nasality is much higher in /nen/. Furthermore, nasalance percentage ratios were calculated for /e/ in different contexts; this was calculated following the formula $100*A_{nasal}/A_{nasal} + A_{oral}$ as per Stewart & Kohlberger (2017).

Word	**Pronunciation**	**Segment analysed**	**Gloss**	**Nasalance percentage ratio**
e	[e]	[e]	'and' (before /i/)	46.51%
en	[en]	[e]	'in' or 'on'	48.13%
		[n]		61.25%
ne	[ne]	[n]	pseudoword	56.38%
		[e]		50.62%
nen	[nen]	[n]	'boy' (loanword from Catalan)	61.9%
		[e]		50.34%
		[n]		64%
net	[net]	[n]	'Internet'	61.88%
		[e]		50.08%
		[t]		46.38%
te	[te]	[t]	'to you' (sing)	40.81%
		[e]		47.54%
ten	[ten]	[t]	'you have' (imperative)	44.26%
		[e]		47.22%
		[n]		62.58%
tet	[tet]	[t]	pseudoword	42.79%
		[e]		42.58%
		[t]		43.07%

Table 2. Nasalance percentage ratios for different segments calculated following the formula $100*A_{nasal}/A_{nasal} + A_{oral}$ (Stewart & Kohlberger 2017)

As we can see from Table 2, /e/ in /e/, in /te/ and in /ten/ have similar nasalance values; we can take 46.51% as the baseline value as that is the nasalance percentage ratio when /e/ is pronounced in isolation. The nasalance percentage ratio is slightly higher in /en/, higher in /ne/, /nen/, and /net/, and finally, much lower in /tet/. The data from Figure 3 and Table 5 show that, in Aragonese Spanish, vowels are nasalized

not only between two nasals or after a pause if they precede a nasal consonant, but also if they follow or precede a nasal (e.g. /en/ and /ten/, respectively). A more detailed analysis is needed to understand nasalization in Aragonese Spanish better.

In speakers with lower levels of instruction, the conjunction *o* 'or' (/o/) may be changed into [u], even when the next word begins with a consonant (2).

(2)

Seis o siete [sejs u ˈsjete] 'six or seven'

3.1.2 Diphthongs

Aragonese Spanish has 14 diphthongs, the same as Castilian Spanish (Martínez-Celdrán et al. 2003). Eight diphthongs are formed of a glide plus a mid/low vowel ([je], [ja], [jo], [ju], [wi], [we], [wa] and [wo]) and six diphthongs are formed of a mid/low vowel plus a glide ([ej], [ew], [aj], [aw], [oj] and [ow]). The diphthongs were analyzed using a similar methodology to monophthongs regarding settings and segmentation of the onset and offset. However, diphthongs were analyzed using a script written by the second author which analyzed the mean F1 and F2 of the vowel sequence in the 20% - 30% and 70% - 80% portion of each sequence (Table 3).

Diphthong	Example word	Transcription	Gloss	Tokens	Mean length (ms) SD in bracket
/ie/	*tiempo*	[ˈtjempo]	'weather'	18	112.86 (14.93)
/ia/	*hacia*	[ˈaθja]	'towards'	18	133.55 (32.08
/io/	*novio*	[ˈnoβjo]	'boyfriend'	18	140.98 (25.58)
/iu/	*ciudad*	[θjuˈðað]	'city'	18	100.37 (22.63)
/ui/	*ruido*	[ˈrwiðo]	'noise'	17	141.79 (21.54)
/ue/	*bueno*	[ˈbweno]	'good'	19	134.21 (29.43)
/ua/	*suave*	[ˈswaβe]	'soft'	18	178.40 (27.9)
/uo/	*cuota*	[ˈkwota]	'fee'	18	128.18 (21.23)
/ei/	*reina*	[ˈrejna]	'queen'	18	148.35 (26.84)
/eu/	*feudo*	[ˈfewðo]	'fief'	18	177.77 (23.68)
/ai/	*hay*	[ˈaj]	'there is/are'	18	229.21 (33.81)
/au/	*auto*	[ˈawto]	'car'	16	150.33 (23.27)
/oi/	*hoy*	[ˈoj]	'today'	18	241.45 (34.26)
/ou/	*Salou*	[saˈlow]	'proper noun' (a beach)	19	163.62 (30.13)

Table 3. F1 and F2 of the diphthongs of Aragonese Spanish. Mean values taken from the 20% - 30% and 70% - 80% section of 251 diphthongs pronounced by 10 Aragonese Spanish speakers (six males and four females

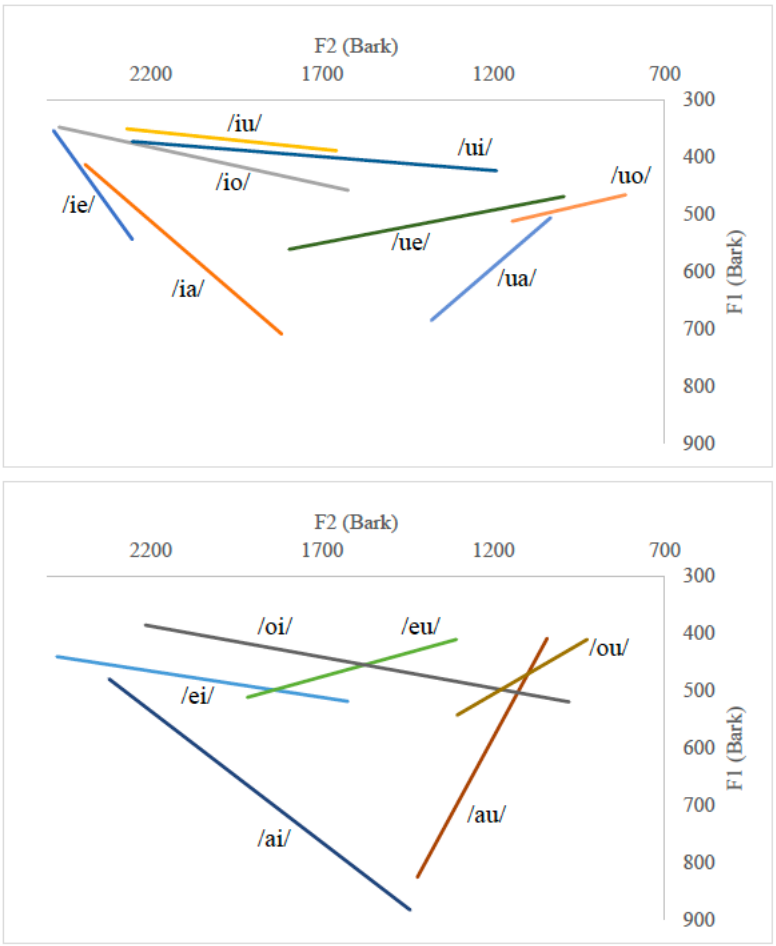


Figure 4. Diphthongs of Aragonese Spanish. Mean values (Hz) taken from the 20% - 30% and 70% - 80% portion of 251 diphthongs pronounced by ten Aragonese Spanish speakers (six males and four females). To aid clarity, rising diphthongs and /iu/ and /ui/ are plotted in the top and falling diphthongs at the bottom

Occasionally, the first element in the diphthong /ei/ can lower and be pronounced [ai] in speakers with lower levels of instruction (3). In those cases, it results in neutralization of /ej, aj/. Sporadically, [oj] and [aj] can neutralize as well. This has also been noted in other varieties of Iberian Spanish (Navarro Tomás 1965: 193).

(3)

seis	[sajs]	'six'
peine	[ˈpajne]	'comb'

Sometimes, in specific contexts in lower basilects, two adjacent vowels can be reduced to one (4); Mott (2007: 110) noted a similar tendency in Chistabino, in the Aragonese Pyrenees. This type of vowel reduction in diphthongs and in hiatuses can happen within a word or across word boundaries and it has been noted previously (e.g. Navarro Tomás 1965: 189):

(4)

Rafael	[raˈfel]	'proper noun'
Eugenio	[uˈxenjo]	'proper noun'
veintidós	[bintiˈðos]	'twenty-two'
muy caro	[ˈmu ˈkaro]	'very expensive'

It has been reported that, since the Middle Ages, there is in Aragón a tendency to avoid hiatus to preserve strong consonant boundaries between syllables (Frago 1976: 66). One vowel can be reduced or omitted, as shown above, or an epenthetic consonant can be introduced in the middle of the two vowels to break the hiatus (5).

(5)

foeta > *foyeta* [foˈ̯jeta] 'nape' (in the province of Huesca, in almost all the province of Zaragoza and in the eastern part of Teruel).

Another strategy to avoid hiatuses is closing the unstressed vowel and pronouncing it as a glide (6). Vowel reduction, inserting an epenthetic consonant and closing unstressed vowels are also common anti-hiatus solutions in varieties of Aragonese, such as in Chistabino (Mott 2007: 109); nevertheless, Aragonese Spanish prefers the latter. Vowel closing to create a diphthong has been reported across the Spanish speaking world, such as in Chile (Rabanales 1960) and Colombia (Garrido 2008), ASALE (2005: 339) links this type of vowel closing to speakers with lower levels of instruction. It is generally accepted that Spanish has an anti-hiatus tendency (Hualde 2005) and this has been documented since very early studies (e.g. Nebrija 1492).

(6)

peor	/peˑor/ > [ˈpjoɾ]	‘worse’
trae	/ˈtra.e/ > [traj]	‘bring it to me’

Vowel closing can even occur in contexts where previously there were not two vowels in contact. That is the case of *pedazo* ‘piece’ and *comprado* ‘bought’ (7).

(7)

pedazo	/peˑda.θo/ [peˑða.θo] > [peˑa.θo] > [ˈpja.θo]	‘piece’
comprado	/komˑpra.do/ [komˑpra. ðo] > [komˑpraw]	‘bought’

In both cases, intervocalic [ð] has been deleted, which originated a hiatus first and then a diphthong by vowel closing.

Two vowel phenomena can occur in the same speech (8):

(8)

te lo he dicho	/te lo ˈe ˈditʃo/ > [te laj ˈðitʃo]	‘I have told you’

In this example it can be first observed the closing of vowel /e/ in [j] (*lo he* > [loj]) to avoid hiatus and then, the neutralization of /oj, aj/, as it has been highlighted before ([loj] > [laj]). Words boundaries, as it can be noticed, do not affect such phenomena. When there is a sequence of identical vowels, both vowels are usually maintained (9).

(9)

creer	/kɾeˈer/ [kɾeˈer]	‘to believe’

3.1.3 Triphthongs

Aragonese Spanish has seven triphthongs, as Castilian Spanish (Canellada & Madsen 1987). They all have a stressed nucleus flanked by glides derived from /i/ and

/u/, which are transcribed as [j] and [w], respectively. The triphthongs were analyzed using a similar methodology to monophthongs. However, triphthongs were analyzed using a script written by the second author which analyzed the mean F1 and F2 of the vowel sequence in the 20% - 30%, 45% - 55%, and 70% - 80% portion of each sequence (Table 4).

Triphthong	Example word	Transcription	Gloss	Tokens	Mean length (ms) SD in brackets
/iei/	*copiéis*	[koˈpjejs̻]	'you (PL) copy (SUBJUNCTIVE)'	20	244.99 (46.69)
/iai/	*copiáis*	[koˈpjajs̻]	'you (PL) copy'	21	262.25 (36.31)
/iau/	*miau*	[mjaw]	'miaow'	16	237.07 (31.08)
/ioi/	*opioide*	[oˈpjojðe]	'opioid'	20	264.25 (31.08)
/uei/	*continuéis*	[koɲtiˈnwejs̻]	'you (PL) continue (SUBJUNCTIVE)'	21	259.27 (38.89)
/uai/	*continuáis*	[koɲtiˈnwajs̻]	'you (PL) continue'	21	231.18 (48.85)
/uau/	*guau*	[gwaw]	'woof'	21	214.98 (30.42)

Table 4. F1 and F2 of the triphthongs of Aragonese Spanish. Mean values taken from the 20% - 30%, 45% -55%, and 70% - 80% portion of 140 triphthongs pronounced by 11 Aragonese Spanish speakers (eight males and three females)

The distribution of Aragonese triphthongs are shown in Figure 5.

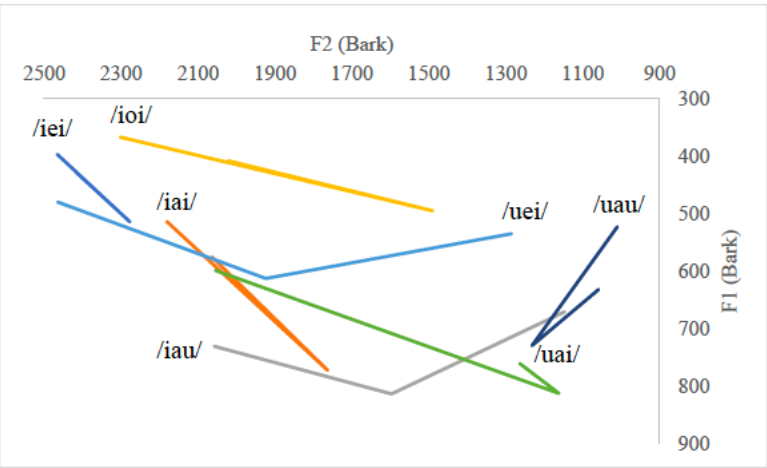


Figure 5. Triphthongs of Aragonese Spanish. Mean values (Bark) taken from the 20% - 30%, 45% -55%, and 70% - 80% portion of 140 triphthongs pronounced by 11 Aragonese Spanish speakers (eight males and three females). Labels are placed at the onset of each triphthong.

3.1.4 Syllable structure

Aragonese Spanish has the same syllable structure as Castilian Spanish; an analysis of the syllable structure of Spanish can be found in Fernández Sevilla (1980). The nucleus of a syllable is always a vowel (Table 5). Consonants in the onset and in the offset are optional and a maximum of two consonants are allowed in onset and in offset position. All consonants can be in onset position, although /ɾ/ can only be in onset position word-medially, in intervocalic position. Aragonese Spanish can have a two-consonant cluster in onset position but there are restrictions; the complex consonant clusters allowed in onset position are /pɾ/, /bɾ/, /dɾ/, /tɾ/, /kɾ/, /gɾ/, /fɾ/, /pl/, /bl/, /kl/ and /gl/. In Aragonese Spanish, all consonants can be found in offset position, except /ɲ/, /ʎ/ and /ʝ/; the opposition /ɾ/ - /r/ is neutralized in coda and the realization of the consonant can have a whole range of different realizations in a continuum which goes from tap to trill (Blecua Falgueras 2005), as we have already seen.

Syllable type	**Word**	**Transcription**	**Gloss**
V	*y*	/i/	‘and’
CV	*sí*	/si/	‘yes’
VC	*en*	/en/	‘in’, ‘on’
CVC	*las*	/las/	‘the’ (fem. plural)
CCV	*trabajar*	/trabaˈxar/	‘to work’
VCC	*instalar*	/instaˈlar/	‘to install’
CCVC	*tres*	/tres/	‘three’
CVCC	*constatar*	/konstaˈtar/	‘to confirm’
CCVCC	*transcribir*	/transkɾiˈbir/	‘to transcribe’

Table 5. Types of syllable structures in Aragonese Spanish

3.2 Consonants

	Bilabial	Labio-dental	Inter-dental	Dental	Alveolar	Post-alveolar	Palatal	Velar
Plosive	p b			t̪ d̪				k g
Affricate						tʃ		
Nasal	m				n		ɲ	
Trill					r			
Flap					ɾ			
Fricative		f	θ		s		ʝ	x
Lateral fricative					l		ʎ	

Table 6. Consonant phonemes in Aragonese Spanish

Aragonese Spanish has nineteen consonant phonemes, as Castilian Spanish (Martínez-Celdrán et al. 2003). All consonant phonemes can appear in onset position word-initially or word-medially, except /ɾ/, which can only appear word-medially in intervocalic position. The word list below exemplifies the consonant phonemes found in Aragonese Spanish (10). To aid comparison between different varieties of Spanish, the word list has been taken from the Illustration on Eastern Andalusian Spanish (Herrero de Haro & Hajek 2022); one word has been added to the list to illustrate /ʎ/, since this phoneme is no longer found in Eastern Andalusian Spanish.

(10)

/p/	*pato*	/ˈpato/	‘duck’
/b/	*va*	/ˈba/	‘he/she goes’
/m/	*mano*	/ˈmano/	‘hand’
/f/	*fácil*	/ˈfaθil/	‘easy’
/θ/	*cine*	/ˈθine/	‘cinema’
/t̪/	*té*	/ˈt̪e/	‘tea’
/d̪/	*da*	/ˈd̪a/	‘he/she gives’
/s/	*soso*	/ˈsoso/	‘bland/dull’
/n/	*no*	/ˈno/	‘no’
/ɾ/	*pero*	/ˈpero/	‘but’
/r/	*perro*	/ˈpero/	‘dog’
/l/	*la*	/la/	‘the (fem. sing.)’
/tʃ/	*chaleco*	/tʃaˈleko/	‘waistcoat’
/ɲ/	*ñu*	/ˈɲu/	‘gnu’
/ʝ/	*yo*	/ˈʝo/	‘I’
/ʎ/	*caballo*	/kaˈbaʎo/	‘horse’
/k/	*coche*	/ˈkotʃe/	‘car’
/g/	*gota*	/ˈgota/	‘drop’
/x/	*jefe*	/ˈxefe/	‘boss’

Unlike what happens in many varieties of Spanish, such as Caribbean or Andalusian Spanish (Lipski 2011, Herrero de Haro 2020), Aragonese Spanish is a conservative variety of Spanish and codas are generally retained even in an informal register.

Aragonese Spanish has voiced and voiceless plosives. As shown in Table 7, voiced plosives are pronounced with lead-VOT and voiceless plosives display short-lag VOT.

Phoneme	Sequence	VOT	Standard Deviation
/b/	[ba]	-87.87	13.71
/d/	[da]	-79.94	14.41
/g/	[ga]	-53.42	17.68
/p/	[pa]	8.58	.94
/t/	[ta]	10.35	1.42
/k/	[ka]	20.12	1.61

Table 7. Average length (ms) of VOT in Aragonese Spanish plosives. Each word was pronounced ten times by a female speaker of Aragonese Spanish (*n* = 60)

As in Castillian Spanish, /b/, /d/ and /g/ are pronounced [b], [d] and [g], respectively, in utterance-initial position and after nasals; /d/ is also pronounced [d] after [l] (11). In all other contexts, /b/, /d/ and /g/ are pronounced as fricatives ([β], [ð], [ɣ]) or as approximants ([β̞], [ð̞], [ɰ]); this pattern of variation is similar to the one found in other varieties of Spanish, such as in Murcian Spanish (Monroy & Hernández-Campoy 2015). For ease of transcription, the fricatives [β], [ð], and [ɣ] and the approximants [β̞], [ð̞], [ɰ] will be transcribed as [β], [ð], and [ɣ] from now on. [t] and [d] are dental in Aragonese Spanish but the dental diacritic will be not included from now on for ease of transcription; this is why /l/ becomes dental before [d] in *el dinero* 'the money', below. It is relevant to add that some studies consider /t/ and /d/ not strictly dental, but dentoalveolar and the part of the tongue involved in the pronunciation of them is the lamina or blade, instead of the tip (Fernández Planas 2007).

(11)

banco	[ˈbaŋko]	‘bank’
ese banco	[ˈese ˈβaŋko]	‘that bank’
dinero	[diˈnero]	‘money’
ese dinero	[ˈese ðiˈnero]	‘that money’
el dinero	[e̯l diˈnero]	‘the money’
gorra	[ˈgora]	‘cap’
esa gorra	[ˈesa ˈɣora]	‘that cap’

In order to quantify spirantisation, a series of phonetic features were analyzed for [b], [d], [g], [β], [ð] and [ɣ] (Table 8). These included duration, minimum intensity, mean intensity, maximum intensity, harmonics-to-noise ratio, maximum intensity minus minimum intensity divided by time, maximum intensity minus minimum intensity, minimum intensity divided by maximum intensity, and root-mean-square; some researchers, such as Ortega-Llebaria (2003), consider differences in root-mean-square and differences between maximum and minimum intensity as solid cues to distinguish stops from fricatives and, therefore, reliable cues to identify spirantization in Spanish. It should be noted that in the sequences analysed, duration, maximum intensity, maximum intensity – minimum intensity divided by duration, and RMS are higher in [b], [d] and [g] than in [β], [ð], and [ɣ], respectively. Minimum intensity, harmonics-to-noise ratio and minimum intensity divided by maximum intensity are lower in stops than in fricatives.

	[b]	[β]	[d]	[ð]	[g]	[ɣ]
Duration (ms)	105.9 (17.07)	72.7 (9.59)	76.27 (16.02)	65.1 (8)	74.57 (18.09)	57.2 (9.07)
Minimum intensity	20.8 (5.39)	31.7 (4.22)	26.91 (5.28)	31.5 (3.06)	31.71 (4.31)	43.8 (4.82)
Mean intensity	38.9 (3.81)	40.7 (3.16)	45.73 (4.47)	39 (2.21)	51 (4.51)	48.4 (5.18)
Maximum intensity	51.4 (2.95)	47.9 (3.18)	57.18 (4.17)	45.8 (1.32)	60.14 (4.88)	53 (4.06)
Harmonics-to-noise	7.99	9.23	8.27	8.84	6.77	7.53

	[b]	[β]	[d]	[ð]	[g]	[ɣ]
ratio	(3.16)	(1.2)	(1.87)	(1.93)	(2.79)	(5.11)
(Max intensity – Min intensity)/duration	.3 (.06)	.23 (.05)	.4 (.08)	.22 (.04)	.39 (.12)	.17 (.06)
Max intensity – Min intensity	30.6 (4.27)	16.2 (3.85)	30.27 (5.78)	14.3 (2.79)	28.43 (6.5)	9.2 (2.39)
Min intensity / Max intensity	.4 (.1)	.66 (.08)	.47 (.09)	.69 (.06)	.53 (.09)	.83 (.05)
RMS	.052 (.024)	.023 (.005)	.058 (.019)	.017 (.003)	.049 (.017)	.017 (.006)

Table 8. Mean values for different phonetic features of [b], [β], [d], [ð], [g] and [ɣ] to analyse spirantization in Aragonese Spanish. Standard deviation incluced in brackets. Data measured in the sequences [ˈbaβa] (*n* = 10), [ˈdaða] (*n* = 11), and [ˈgaɣa] (*n* = 7).

Further information regarding spirantization in Spanish can be found in Colina (2020). There seems to be a high degree of free variation in coda stops which is linked to stylistic factors and to different degrees of formality. Voiceless stops in coda position may surface as voiceless stops (12), but they may also undergo voicing and spirantization (13). Voiced stops in coda tend to be pronounced as fricatives (14).

(12)

acto [ˈakto] ‘act’

(13)

etnia [ˈeðnja] ‘ethnic group’

(14)

abdicar [aβðiˈkar] ‘to abdicate’

Intervocalic [ð] is often deleted, more commonly if the word has the stress in the penultima syllable (15)

(15)

colorado [koloˈrao] ‘red’.

At times, /tʃ/ can be pronounced as a postalveolar consonant, which reveals fronting (16).

(16)

chaleco /tsaˈleko/ ‘waistcoat’

As in all other varieties of Spanish, such as Eastern Andalusian Spanish (Herrero de Haro & Hakek 2022), Castilian Spanish (Martínez-Celdrán et al. 2003: 258), Mexico City Spanish (Avelino 2018) and also in Chistabino (Mott 2007: 106) – local variety spoken in the north part of Aragón –, the alveolar consonants /n/ and /l/ in coda assimilate their place of articulation to that of the following consonant. This type of regressive assimilation also operates across word boundaries, as there is no pause between both sounds due to coarticulation. Thus, both /n/ and /l/ vary their place of articulation from alveolar to dental if the following segment is dental (/t/, /d/) (17); vary to interdental if followed by the interdental consonant [θ] (18) and vary to a postaveolar articulation before [tʃ] (19). Besides these cases, /n/ in coda moves to a labiodentalized articulation before [f] (20), to a velarized articulation before a velar consonant (21), and to a uvularized articulation before a uvular consonant (22). We should warn that in Aragonese Spanish (neither in other varieties of Spanish) a uvular consonant phoneme does not exist, but it appears as an allophone of /x/ just before a back vowel (/o/, /u/) or [w], as it happens in *enjuto* ‘bony’ (Hidalgo Navarro & Quilis Merín 2012: 191). Martínez Celdrán & Fernández Planas (2013: 130) support that the assimilation of /n/ to the next consonant is clear in electropalatographies, even though it may not be such evident acoustically.

(17)

Dentalized	[n̪]	*se esconde*	[sesˈkon̪de]	‘one hides’
	[l̪]	*alto*	[ˈal̪to]	‘tall’

(18)

Interdentalized	[n̟]	*once*	[ˈõn̟θe]	‘eleven’
	[l̟]	*el cine*	[el̟ ˈθine]	‘the cinema’

(19)

Palatalized	[nʲ]	*ancho*	[ˈãnʲtʃo]	‘broad’
	[lʲ]	*el chocolate*	[elʲ tʃokoˈlate]	‘the chocolate’

(20)

Labiodentalized	[ɱ]	*ánfora*	[ˈãɱfora]	‘amphora’

(21)

Velarized	[ŋ]	*banco*	[ˈbaŋko]	‘bank’

(22)

Uvularized	[ɴ]	*enjuto*	[ẽɴˈχuto]	‘bony’

The trill is found word-initially, intervocalically, and in syllable onset word-medially after /n/, /l/ and /s/, while the tap is only found in intervocalic position and in the sequences /fr/, /pr/, /br/, /tr/, /dr/, /kr/ and /gr/. The phonemic opposition /r/ vs /ɾ/ only operates in intervocalic position; /r/ is not found in word-initial position and the opposition between these two rhotics is neutralized syllable-finally. As explained in Bradley (2014), syllable-final rhotics in Spanish can present a great deal of variability and their phonetic realization can vary from tap to trill depending on stylistic variation. Thus, last *-r* can be pronounced as trill, as flap or even it may be a very weakened flap, nevertheless it maintains a small plosive feature, albeit very rarely, as in (23).

(23)

llorar [ˌjoˈraʲ] ‘to cry’

Coda rhotics are transcribed in the present paper as /r/, as in Monroy & Hernández-Campoy (2015) and Herrero de Haro & Hajek (2022).

In some basilects of Aragonese Spanish, /r/ can assimilate to a following /l/, mainly in infinitives followed by a clitic (24). Unlike what happens in other varieties of Spanish, such as in Eastern Andalusian Spanish (Herrero de Haro & Hajek 2022), the assimilation of the rhotic into the following lateral does not cause gemination of the latter nor vowel lowering.

(24)

hay que vaciarlo	[aj ke βaˈθjalo]	‘it has to be emptied’
habrá que comprarlo	[aˈβra ke komˈpralo]	‘one will have to buy it’

The phonemes /s/ and /θ/ have merged across the great majority of varieties of Spanish. *Ceceo*, pronouncing /s/ and /θ/ as [θ], is found in Andalusia (Regan 2017); *seseo*, pronouncing /s/ and /θ/ as [s], is found in Andalusia, in the Canary Islands, and across all of Latin America (Moreno-Fernández 2020: 95). Aragonese Spanish has not merged /s/ and /θ/ and these two phonemes are still distinguished in this variety of Spanish.

Fricative /s/ in Spanish may have different realizations (Fernández Planas 2001: 155; Hidalgo Navarro & Quilis Merin 2012: 190). The most common one is the apico-alveolar ([s̺]) where the tongue is in a concave position; it is spread in the north and the central regions of the Iberian Peninsula. The laminoalveolar /s/ ([s̻]) is frequent in areas where *seseo* is also present and the tongue adopts a convex position. In laminal voiceless /s/ ([s̪]) the tongue stays flat; it normally appears in some parts of Andalusia and some Hispano-American countries. Lastly, in the laminodentoalveolar, the front of the tongue goes to the upper teeth. The fricative /s/ is clearly apico-alveolar in Aragonese Spanish, with a lower pitch than expected in lamino-alveolar /s/. It is the same articulation Fernández Planas (2007) describes through the analysis of the electropalatographs of four speakers from Barcelona and surroundings.

/s/ can be voiced in coda before a voiced consonant (e.g. *rasgo* [ˈrazɣo] 'feature'), but intervocalic voicing of /s/ does not occur. In informal situations, the cluster /ks/ can be pronounced [s]; this is very common in words beginning with *ex-* (prefix or not) (25).

(25)

examen	[eˈsamẽn]	'exam'
exnovio	[esˈnoβjo]	'ex-boyfriend'

According to Hidalgo Navarro & Quilis Merín (2012: 190), /s/ before the trill /r/ tends to disappear in common speech (*Israel* [iraˈel]) or tends to be articulated as an assibilated voiced in conscientious speech (*Israel* [iɹraˈel]). However, we have not observed this in Aragonese Spanish.

The palatal fricative /ʝ/ can become a palatal affricate in utterance-initial position or after pause, nasal or lateral consonant (26).

(26)

yo [ˈʄo] 'I'

A spectral analysis of the fricatives in Aragonese Spanish is included in Table 9; it should be noted that /ʝ/ was realised [ʄ] in the ten tokens gathered for the analysis of the fricatives. The features analysed are duration, centre of gravity, standard deviation, skewness, kurtosis, zero crossings multiplied by 10 and divided by the duration, minimum intensity, mean intensity, maximum intensity, and the frequency of maximum intensity; these are the features which are usually included when analysing fricatives in Spanish (e.g. von Essen 2016, Molina García 2019). The spectral analysis was performed using a Praat script written by Elvira-García (2014).

	/f/	/θ/	/s/	/ʝ/	/x/
Duration (ms)	135.7	152.3	143	74.7	163.1
Centre of gravity	7823	6502	6297	3843	3103
Standard deviation	3094	2813	1937	2029	2064
Skewness	-.95	-.25	.94	1.71	1.25
kurtosis	.77	-.95	.24	9.32	1.68
Zero crossings * 10/duration	187.77	157.81	124.72	16.08	80.47
Minimum intensity	45	46	47.2	34.9	49.3
Mean intensity	63.6	61.7	71.2	41.3	66.6
Maximum intensity	57.8	56.6	66.1	46.2	61.4
Frequency of maximum intensity	10432	6974	5145	3538	1658

Table 9. Spectral analysis of the fricative consonants of Aragonese Spanish. Data measured in ten repetitions each of the sequences /fa/, /θa/, /sa/, /ʝa/, and /xa/ (*n* = 40 tokens)

Most varieties of Spanish have merged /ʝ/ and /ʎ/, with [ʝ] being the most common phonetic realization of the merger across the Spanish speaking world (Moreno-Fernández 2020: 95). According to Martínez-Celdrán et al. (2003: 258), /ʎ/ is usually pronounced as a central palatal in all large cities in Spain but Moreno-

Fernández (2020: 59) goes further and claims that there are very few places which still distinguish /ʝ/ and /ʎ/. There are some varieties of Spanish where the phonetic realization of the merger of these phonemes is not [ʝ], but [ʒ] or [ʃ], as Argentine Spanish (Coloma 2018). There is evidence that /ʝ/ and /ʎ/ are still distinguished in Aragonese Spanish, although this is much more common in older speakers. While some older speakers of Aragonese Spanish still distinguish words such as *poyo* (27) and *pollo* (28) most speakers, including all younger ones, have lost this distinction in favour of the palatal fricative. This change is in progress, as Alvar *et al*. (1983) (based on older data) reports distinction between those phonemes, while current investigations note that most speakers do not make this distinction nowadays (Rost 2014; Pontes *et al*., 2014). It should be noted that there are very few minimal pairs being distinguished by /ʝ/ and /ʎ/ and it could be argued that this very low functional load has contributed to this phonemic merger. Mott (2007: 106) noted a similar change in Chistabino, although he claims that the distinction is maintained in some specific words.

(27)
poyo [ˈpoʝo] ‘stone bench’
(28)
pollo [ˈpoʎo] ‘chicken’

3.3 Prosody

3.3.1 Lexical stress

In every variety of Spanish, stress has phonemic value, as it can be observed in Castillian Spanish (Martínez-Celdrán et al. 2003) in Murcian Spanish (Monroy & Hernández-Campoy 2015), in Argentine Spanish (Coloma 2018) and in Eastern Andalusian Spanish (Herrero de Haro & Hajek 2020). Just the same occurs in Aragonese Spanish (29). It is a common feature in most other Romance languages too (Hualde & Prieto 2015). Words in Aragonese Spanish have only one stressed syllable, with the exception of some compounds and the adverbs ending in *-mente* ‘-ly’. As shown in

Hualde (2010), despite claims from other authors, it is possible to have two adjacent stressed syllables (30).

(29)
género [ˈxenero] ‘gender’
genero [xeˈnero] ‘I generate’
generó [xeneˈro] ‘he/she generated’
(30)
normalmente [norˈmalˈmẽnte] ‘normally’

Most words in Castilian Spanish are stressed in the penultima syllable (Harris 1983); Aragonese Spanish emphasizes this tendency and, through stress shifting, stress tends to be shifted from the antepenultima to the penultima syllable (31) (Nagore 2002: 16). In some cases, shifting the stress in this manner has consequences for syllable structures and it can turn a hiatus into a diphthong (32). Duration, f0, and intensity have been analysed in the words *género* ‘gender’, *genero* ‘I generate’, and *generó* ‘he/she generated’ (Table 10) to analyse the acoustic correlates of stress; duration seems to be the most robust feature.

(31)
pájaro /ˈpaxaro/ [paˈxaro] ‘bird’
médico /ˈmediko/ [meˈðiko] ‘doctor’
(32)
habíamos /aˈbi.amos/ > [aˈβjamos] ‘we had’

Word	**Feature**	**Vowel**		
		/e/	/e/	/o/
Género	Minimum intensity	69.2 (2.94)	67.56 (2.7)	65.36 (2.55)
	Mean intensity	72.48 (1.41)	68.84 (2.74)	67.17 (2.49)
	Maximum intensity	75.57 (2.37)	69.53 (2.73)	68.61 (2.64)
	Lowest f0	196 (5.18)	213 (20.61)	241.73 (30.92)
	Mean f0	201 (4.82)	219 (18.47)	246 (31.27)
	Highest f0	208 (3.49)	224 (16.12)	254 (30.04)
	Duration	73.42 (11.21	65.2 (12.49)	52.13 (9.77)
		/e/	**/e/**	/o/
Genero	Minimum intensity	69.83 (2.05)	69.34 (2.13)	69.98 (3.01)
	Mean intensity	71.8 (1.51)	71 (2.2)	71.42 (2.27)
	Maximum intensity	73.48 (1.71)	72.56 (2.07)	72.47 (2.15)
	Lowest f0	165 (5.89)	168 (4.7)	211 (24.86)
	Mean f0	174 (5.44)	180 (7.21)	219 (26.62)
	Highest f0	189 (5.25)	190 (11.04)	222 (27.84)
	Duration	42.63 (6.27)	99.62 (6.69)	55.36 (9.11)
		/e/	/e/	**/o/**
Generó	Minimum intensity	72.24 (1.64)	67.05 (2.55)	68.78 (1.98)
	Mean intensity	73.02 (1.42)	68.66 (1.92)	71.81 (1.13)
	Maximum intensity	74.2 (1.95)	69.57 (1.89)	73.98 (1.39)
	Lowest f0	172 (4.28)	153 (3.89)	176 (6.31)
	Mean f0	181 (5.3)	159 (3.94)	191 (10.67)
	Highest f0	194 (6.11)	164 (4.21)	204 (19.05)
	Duration	37.41 (6.74)	84.2 (9.51)	97.87 (10.65)

Table 10. Intensity, f0 and duration of the vowels in *género* 'gender', *genero* 'I generate', and *generó* 'he/she generated'. Stressed vowel marked in bold. Data measured in 10 repetitions from each word (30 words and 90 vowels in total) pronounced by a female native speaker of Aragonese Spanish. Standard deviation included in brackets.

3.3.2 Intonation

According to Hualde & Prieto (2015: 361), Spanish speakers are normally aware of some intonation differences across different varieties of Spanish, although they both assume too that there is no thorough acoustic description of intonation patterns. Nevertheless, "some geolectal differences in pitch alignment or preferences for certain accent types and pitch contours in specific contexts can be tentatively proposed on the basis of the evidence current available" (Hualde & Prieto 2015: 361).

It has been traditionally accepted that Aragonese Spanish intonation patterns differ from those in standard Spanish; however, as it has been already explained, this belief has not been analyzed empirically. According to Simón (2009), the major difference seems to be observed in the intonation of the capital city of Zaragoza, which is characterized by a circumflex final in whole and cut short sentences: it progressively ascends and then descends in the last syllable (Simón 2009). Additionally, intensity in the syllable following the stress maintains longer; this does not occur in Castilian Spanish (Martínez-Celdrán et al. 2003). As Simón (2009) shows, this could explain why it has been typically argued that final inflexion is higher in Aragonese Spanish than in Castilian Spanish.

Castañer et al. (2005) analyze declaratory and interrogative recordings of a woman speaker from Zaragoza and highlight that there is a sudden rise in the final syllable of a subject clause and there is a fall of f0 in the toneme. These authors (Castañer *et* al. 2005: 275) agree that there is no other fundamental difference between the declaratory statement curve to be found in the Spanish of Zaragoza and that of standard peninsular Spanish (Castañer et al. 2005: 276). Both studies on intonation in Zaragoza (Castañer et al. 2005, Simón 2009) point out that their results are provisional and that more studies should be conducted.

Intonation patterns are not uniform across all the areas where Aragonese Spanish is spoken. Thus, studies which compare two places of Aragón have found some differences, such as between Zaragoza and Jaca (Huesca) (González, Simón & Castañer 2007) or between Calamocha (Teruel) and Albarracín (Teruel) (Vilar 2001). Mott (2010) compares a specific variety of Aragonese (Chistabino) to Castilian. That being said, it is important to note down that the recordings analyzed for this section on intonation have been gathered from two speakers from Alcañiz (Teruel).

The intonation in this section has been analyzed using the Spanish Tones and Break Indices system; for this, we have followed the methodology used by Portocarrero & Stewart (2021). Following Portocarrero & Stewart (2021), we include the waveform, spectrogram, f0 contour and four tiers: utterance, phonetic transcription, break indices and tones. Following Wu, Munro & Wang (2014), the pitch

range was set at 70 - 400 Hz for females and 50 - 300 Hz for males. In Spanish, pitch accents (PAs) coincide with stress syllables (Portocarrero & Stewart 2021), but it is important to note also how the utterances analyzed in this illustration display a low tone at the end and lengthening of the last syllable.

The general nuclear intonation pattern in Aragonese Spanish for declarative statements is progressively descending with a sudden rise towards the end and a final descent and syllable lengthening (Figure 6), while standard Spanish and other varieties of Spanish, such as Castilian Spanish and Eastern Andalusian Spanish, display a progressively descending pattern (e.g. Hidalgo Navarro & Quilis Merín 2012, Martínez-Celdrán et al. 2003; Herrero de Haro & Hajek 2022). The descending pattern can also be noted in the information provided by *Atlas interactivo de la entonación del español* (Prieto & Roseano 2009-2013) in some localities of the Iberian Peninsula and which is extensively studied in Prieto & Roseano (2010). This difference coincides with the results from Simón (2009) for Zaragoza city.

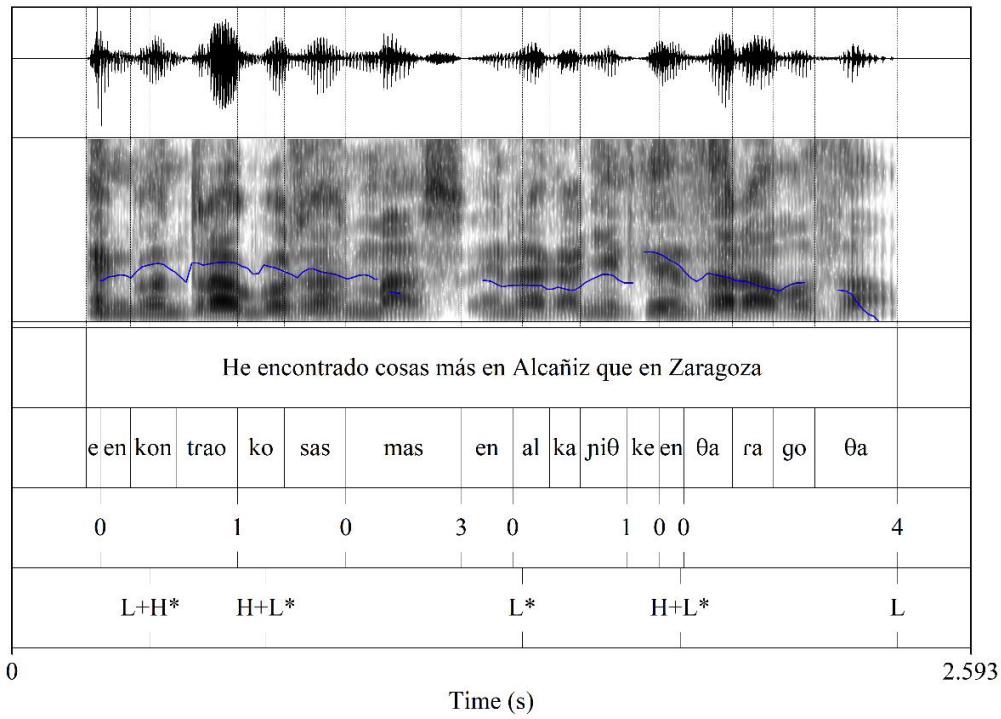


Figure 6. Waveform, spectrogram and pitch contour for a statement in Aragonese Spanish. *He encontrado cosas más en Alcañiz que en Zaragoza* [ˈe eŋkon̪ˈtrao kosas ˈmas en alkaˈɲiθ ke en̪ θaraˈɣoθa] 'I have found more things in Alcañiz than in Zaragoza'

Figure 6 shows a statement which contains two bitonal PAs (L+H* and H+L*), followed by a monotonal L*, and then another bitonal PA (H+L*); it finishes with a low intonation phrase boundary tone (IPBT) (L%). The first PA in the statement starts with a low (L) tone at the onset of the utterance and it scales up to a high (H*) just before the stressed syllable [trao]. The following PA scales down from the high (H) of the stressed syllable to the low (L*) of [mas]. There is then a long monotonal PA (L*) before the final bitonal PA (H+L*), and then the local low for the speaker (L%). The end of the H+L* bitonal PA has a very long syllable and it is followed by an intermediate phrase break index of 3. As in Figure 7 and 8, below, Figure 6 shows lengthening of the final syllable in the L% PA.

As Hualde & Prieto (2015: 370-371) points out, "in Spanish yes/no questions may have the same syntax as statements", therefore intonation will be fundamental to disambiguate meaning. According to Hualde & Prieto (2015: 371), interrogatives in Spanish may display both final rises and final falls, which may have a geolectal origin. Thus, the pragmatically unmarked pattern in Peninsular Spanish, in the Ecuadorian Andes, in Chile and in Mexican Spanish is low rise or falling rising (e.g. L* H%); meanwhile, some varied circumflex contours (e.g. L+¡H* L%) are unmarked in several other areas which include the Caribbean, the Canary Islands, Cantabria (northwest part of the Iberian Peninsula) and Buenos Aires (Argentina) Hualde & Prieto (2015: 374-375). Likewise, Matínez-Celdrán et al. (2003) found the same high-rise pattern for Castilian Spanish and for standard Spanish; Hidalgo Navarro & Quilis Merín (2012: 287) describe a wide falling curve from the first stressed syllable to the last stressed one and, since then, there is the final rise.

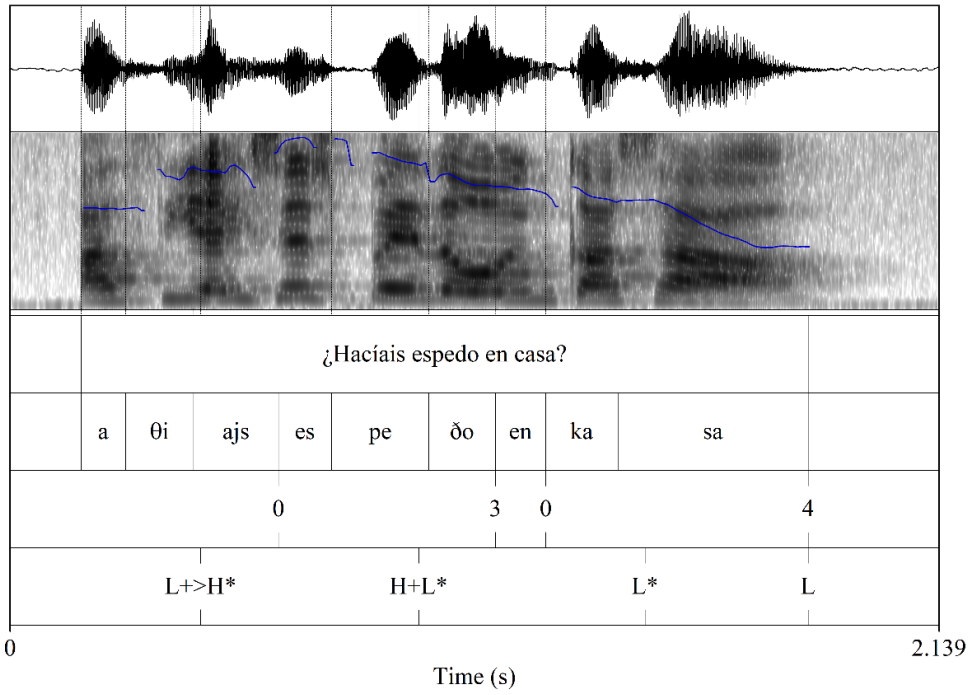


Figure 7. Waveform, spectrogram and pitch contour for a yes/no question in Aragonese Spanish. *¿Hacíais espedo en casa?* [aˈθi.ajs esˈpeðo eŋ ˈkasa] 'Did you do pork guts at home?'

The yes/no question in Aragonese Spanish in Figure 7 contains two bitonal PAs followed by a monotonal PA and a final L% IPBT. In Figure 7, the bitonal PA L+>H* appears in prenuclear position, the bitonal H+L* in the nuclear position, and the monotonal PA L* appears in postnuclear position. This seems to be similar to the patters described by Hualde & Prieto (2015: 374-375) as rising-falling (circumflex). As reported in Eastern Andalusian Spanish (Herrero de Haro & Hajek, 2022), vowel lengthening can be used to add emphasis.

The unmarked pattern form for wh-questions in most geographical varieties of Peninsular and American Spanish (Madrid, Cantabria, Canary Islands, Dominican Republic, Puerto Rico, Venezuela's Andean region, Chile and Buenos Aires) exhibit a final contour analyzable as a L* L% nuclear configuration (Hualde & Prieto 2015: 380). Particular studies corroborate it for standard Spanish (Hidalgo Navarro & Quilis Merín 2012: 288), Castilian Spanish (Martínez-Celdrán et al. 2003), Murcian Spanish (Monroy & Hernández-Campoy 2015), Eastern Andalusian Spanish (Herrero de Haro & Hajek 2022) and even other non-Peninsular varieties of Spanish such as Ecuadorian Cuencano Spanish (Portocarrero & Stewart 2021). The pattern in these varieties of

Spanish coincides with that found in Escandell (2011: 183-184): *"-¿Qué ganó Juan? - Juan ganó el coche*" ('What did Juan win? – Juan won the car'), where the question has a non-identified argument (*qué* 'what') the answer fills. Esteban-Vilaplana & Prieto (2010: 35) hold that both the falling contour, but also the rising contour (L* HH%) are produced in Castilian Spanish for information-seeking wh-questions.

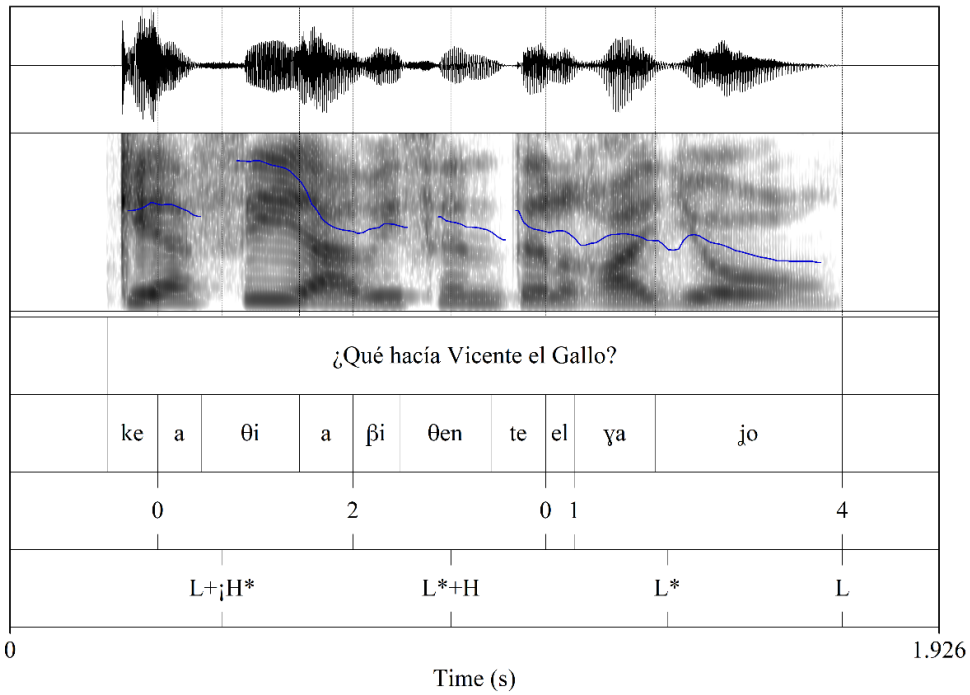


Figure 8. Waveform, spectrogram and pitch contour for a wh- question in Aragonese Spanish. *¿Qué hacía Vicente el Gallo?* [ˈke aˈθia βiˈθe̯nte el ˈɣaʝ̯ o] 'What did Vicente the Rooster do?'

For Aragonese Spanish, the question in Figure 8 contains a L+¡H* PA in nuclear position, L*+H in postnuclear position, then a monotonal PA (L*) and it concludes with a L% IPBT. Once again, an utterance ends with L% and with a long syllable in Aragonese Spanish. The initial PA is a bitonal and upstepped PA (L+¡H*). The last bitonal PA (L*+H) is followed by a long monotonal PA (L*). Therefore, this pattern would be linked to that falling contour described above for other varieties of Spanish.

3.4 Transcription of the recorded passage

Following Herrero de Haro & Hajek (2022), we include below a broad (phonemic) transcription and a semi-narrow (phonetic) transcription of the passage "The North Wind and the Sun".

3.4.1. Broad (phonemic) transcription

‖ el ˈbiento ˈnorte i el ˈsol porˈfiabanˈsobre ˈkual de ˈeʌos ˈera el ˈmas ˈfuerte | kuando aθerˈto a paˈsar ˈun biaˈxero enˈbuelto en ˈantʃa ˈkapa ‖ konbiˈnieron en ke ˈkien ˈantes loˈgrara obliˈgar al biaˈxero a kiˈtarse la ˈkapa | seˈria konsideˈrado ˈmas podeˈroso ‖ el ˈbiento ˈnorte soˈplo kon ˈgran ˈfuria | ˈpero kuanto ˈmas soˈplaba | ˈmas se arebuˈxaba en su ˈkapa el biaˈxero ‖ por ˈfin el ˈbiento ˈnorte abandoˈno la emˈpresa ‖ enˈtonθes | briˈʌo el ˈsol kon arˈdor e inmeˈdiataˈmente se despoˈxo de su ˈkapa el biaˈxero ‖ por lo ke el ˈbiento ˈnorte ˈubo de rekonoˈθer la superiorˈdad del ˈsol ‖

3.4.2 Semi-narrow (phonetic) transcription

‖ el ˈβjen̪to ˈnorte jel ˈsol porˈfjaβan ˈsoβre ˈkwal̪ de ˈeʌos ˈera el ˈmas ˈfwerte | kwan̪do aθerˈto a paˈsar ˈum bjaˈxero emˈbwel̪to en ˈãŋʲtʃa ˈkapa ‖ kombiˈnjeron ẽŋ ke ˈkjen ˈãn̪tez loˈɣrara oβliˈɣar al βjaˈxero a kiˈtarse la ˈkapa | seˈria konsiðeˈraðo ˈmas poðeˈroso ‖ el ˈβjen̪to ˈnorte soˈplo koŋ ˈgraɱ ˈfurja | ˈpero kwan̪to ˈmas soˈplaβa | ˈmas se areβuˈxaβa en su ˈkapa el βjaˈxero ‖ por ˈfin el ˈβjen̪to ˈnorte aβan̪doˈno la emˈpresa ‖ ẽn̪ˈtoɳ̍θez | βriˈʌo el ˈsol kon arˈðor | ejmːeˈðjataˈmẽn̪te se ðezpoˈxo ðe su ˈkapa el βjaˈxero ‖ por lo kel ˈβjento ˈnorte ˈuβo ðe rekonoˈθer la superjoriˈðað ðel ˈsol ‖

3.4.3. Orthographic version

El viento norte y el sol porfiaban sobre cuál de ellos era el más fuerte, cuando acertó a pasar un viajero envuelto en ancha capa. Convinieron en que quien antes lograra obligar al viajero a quitarse la capa sería considerado más poderoso. El viento norte sopló con gran furia, pero cuanto más soplaba, más se arrebujaba en su capa el viajero; por fin el viento norte abandonó la empresa. Entonces brilló el sol con ardor, e inmediatamente se despojó de su capa el viajero; por lo que el viento norte hubo de reconocer la superioridad del sol.

4. Conclusions

In this study we have tried to provide detailed measurements on vowels, consonants and prosody in order to deepen in the acoustic knowledge of Aragonese Spanish and to amplify that one of the Spanish language in general. Apart from that, it has been confirmed that there are certain divergences between Aragonese Spanish in lower basilects and the standard Spanish, such as in the reduction of diphthongs and the closing of the unstressed vowels in diphthongs even between different but adjacent words. Furthermore, individualized analysis in nasalization have shown that vowels are nasalized not only between two nasals or after a pause if they precede a nasal consonant, but also if they follow or precede a nasal.

Concerning to consonants, specific details on spirantization have been done and examples of the assimilation of the alveolar /n/ and /l/ in coda have been offered, among others. I tis remarkable the assimilation of coda /r/ to following /l/ without gemination nor vowel lowering and the maintenance of the phonetic distinction between /ʝ/ and /ʎ/.

In prosody, the duration, the f0, and the intensity have been examined to give further details on lexical stress. Additionally, examples on stress shifting, which is likely to happen in Aragonese Spanish are suggested. Finally, three intonation patterns (statement, yes/no question and wh- question) have been analysed through their waveform, spectrogram and pitch contour using the Spanish Tones and Break Indices system. They have manifested some points in common to what is expected in standard Castilian, but also some differences with other varieties of Spanish.

This investigation concludes with the broad and semi-narrow transcription of a well-known text which is usual in acoustic studies and allows comparison among languages and among varieties of the same language.

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