

# A preliminary investigation of vowel lengthening in non-final position in Friulian

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## Abstract

This paper examines one aspect of vowel lengthening in Friulian, a small language spoken in Northwest Italy. Most accounts of Friulian phonology focus on vowel length in word-final position, and in particular, its frequent association with final devoicing, e.g. /lat/ [lat] ‘milk’ v. /lad/ [la:t] ‘gone’(m.sg) v. /lade/ [lade] ‘gone’(f.sg). These same sources understate or overlook the possibility of long vowels in word-medial position. However, there is evidence that word-medial stressed vowels may be preferentially lengthened before /z/. Here we report on a first experimental investigation of word-medial vowel duration in Friulian. Our results support the notion that stressed vowels are long before /z/ in that language.

## 1. Introduction

The question of vowel length in word-final stressed syllables in Friulian has always been the main focus of phonological research on that language (see Vanelli 2005 for references). Little or no attention has been given to the possibility of long vowels also appearing in non-final position, other than in exceptional cases. However, Hajek (2000) has recently suggested that non-final lengthening also occurs in Friulian and its true extent overlooked.

Our own perceptual evaluation of spoken Friulian points to lengthening of stressed vowels in word-medial open syllables specifically before /z/, e.g. /caze/ [ˈca:ze] ‘house’ rather than normally claimed [ˈcaze]. Such a phenomenon is not explicitly reported in descriptive and other sources on Friulian, but is nevertheless consistent with transcriptions we have observed in many of these sources. We do not find such an effect on unstressed vowels before /z/, e.g. /azi:l/ [aˈzi:l] *asil* ‘shelter’.

In this study we present the results of a preliminary acoustic investigation of vowel duration in penultimate open syllables. First, we consider vowel duration before /z/ and five other obstruents /s v f d t/ in stressed position in order to determine if stressed vowels do indeed show signs, as claimed, of preferential lengthening before /z/. We then examine the duration of the consonant portion in order to better understand any vowel-consonant duration-related interactions. Finally, we also compare vowel duration in stressed and unstressed word-medial syllables before /z/ in order to evaluate the extent of any interaction between vowel lengthening and the presence or absence of stress.

## 2. Background

### 2.1. Friulian

Friulian is a small Romance language spoken in the region of Friuli located in northeast Italy. It is most closely related to Ladin, spoken in Trento-Alto Adige, and to Romansch spoken in the Swiss canton of Grisons. Whilst most Friulian speakers live within the borders of Friuli, large Friulian-speaking communities can also be found today in Australia, Canada, Argentina and elsewhere.

The language has approximately 750,000 speakers. It is protected by national law and there are ongoing efforts to revive and maintain the language. The standard *koiné* is based on the Central variety spoken in and around the main city, Udine, and its namesake province. There are a number of competing orthographies, which share most details, but vary, amongst other things, in the extent to which they explicitly mark vowel length in non-final syllables (see below).

To date there has been almost no experimental investigation of Friulian phonetics. In a small study involving one speaker, Baroni and Vanelli (2000) investigated the interaction between word-final lengthening and final obstruent devoicing. Word-medial duration in Friulian has not been previously investigated.

### 2.2. Vowel length in Friulian

As noted above, most of the published phonological research on Friulian has focused on the issue of vowel length in the language (see Hajek 2000 as well as Vanelli 2005). As in other varieties of Romance spoken in Italy, vowels in Friulian are always short in unstressed position, but may be long in certain stressed positions. Particular attention has been given to what many phonologists, e.g. Hualde (1990),

consider to be an unusual distribution of vowel length in this language, compared to other varieties of Romance. In the first instance, it is claimed that with no or few exceptions (see below), long vowels only appear in word-final syllables. Alongside an underlying length contrast in stressed final open syllables, e.g. /klama:/ [kla'ma:] *clamà* 'to call' v. /klama/ [kla'ma] *clamà* 'he called', long vowels in stressed final closed syllables are often associated with a regular process of final obstruent devoicing, e.g. /lad/ ['la:t] *lât* 'gone'(m.sg) and /lade/ ['lade] *lade* 'gone' (f.sg). In word-medial position, stressed vowels are normally considered to be predictably short, e.g. /lade/ ['lade] *lade* 'gone' (f.sg), /patate/ [pa'tate] *patate* 'potato', /lane/ ['lane] *lane* 'wool'.

In Friulian orthography, long vowels in word-final syllables are always marked with a circumflex, as seen in the examples above.

However, there is some uncertainty – both descriptive and orthographic – as to when and if long vowels can occur in word-medial position. Although the phenomenon is often overlooked, some sources (e.g. Vanelli 2005) note that non-final long vowels are possible, albeit somewhat exceptionally, in a small number of words. These forms are, however, always excluded from further discussion since they are rare and easily associated with one of the following: (1) a reduction of a historical diphthong, e.g. AUCA > /'o:ce/ *ôcje* 'goose'; (2) compensatory lengthening arising from consonant loss, e.g. MATRE > /'ma:ri/ *mâri* 'mother' or (3) cliticized verbs, e.g. /pwar'ta:/ *puartâ* 'to bring' and /pwar'ta:lu/ *puartâlu* 'to bring it'.

With respect to orthographic practice and the examples in (1-3), non-final long vowels are always marked as such in cliticized verbs, but are inconsistently marked in the other two cases, with practice varying considerably, e.g. *mari* ~ *mâri*. Recent guidelines (Osservatori 1999) recommend that length be indicated in only one such lexical item, i.e. *pôre* 'fear' (< \*PAURA), while other orthographic traditions tend to mark more or all of these exceptional forms as long. Individual practice also varies and inconsistencies abound.

As already noted, our own auditory assessment of spoken Friulian indicates that stressed vowels are often lengthened in non-final open syllables before /z/. This claim is supported by occasional and otherwise unexplained published transcriptions of Friulian (given in standardized IPA here) such as [tsi'ni:ze] 'ash' (Goldberg 1985-87) and ['kro:zis] 'crosses', ['ca:ze] 'house', ['mu:ze] 'face' (Frau 1984). In none of these cases is diphthong reduction or compensatory lengthening involved. Orthographic systems for Friulian do not normally mark length in these cases.

### 3. Aims

The main purpose of this study is to measure the duration of vowels in stressed open syllables before the consonants /z s v f d t/ in order to determine whether vowels are in fact preferentially lengthened before /z/ as compared to the other consonants in our sample. The inclusion of consonants other than /z/ is intended to allow for a number of different comparisons to be made, including the effects on vowel duration of (1) consonant duration in general; (2) consonant voicing; (3) consonant manner (stops v. fricatives); as well as (3) consonant place of articulation (alveodental v. labiodental). Each of these factors is known to impact on pre-consonantal vowel duration (e.g. Chen 1970, Esposito 2002). In addition we also examine vowel duration

before /z/ in both stressed and unstressed position. The inclusion of unstressed position is a useful control for the investigation of vowel lengthening in stressed position, given that unstressed vowels are always considered to be phonologically and phonetically short in Friulian as elsewhere in Italy. Only stressed vowels may surface as long, whether by rule or as a result of an underlying contrast (see §6 and Hajek 2000 for details).

## 4. Methods

Two native speakers, both female, of the central variety of Friulian were recorded in Melbourne. A high quality DAT recorder and sound microphone were used at the time of recording. The speakers were born and raised in Tarcento, located close to Udine and within its provincial borders. The central variety of Friulian is their first language, but they are also fluent in Standard Italian. The first speaker now resides in Melbourne but travels regularly back to Tarcento, and continues to speak Friulian with relatives. The second speaker is permanently resident in Tarcento, regularly uses Friulian and was visiting Australia. Both subjects continued to speak Friulian in Melbourne at the time of the recording.

The two subjects were asked to read a list of words inserted within the carrier phrase *O dîs \_\_\_\_\_ dôs voltis* "I say \_\_\_\_\_ two times". Each item in the wordlist contained the vowel /a/ in open stressed syllables before one of the following consonants /z s v f d t/, e.g. *rase* /'raze/ 'he shaves'. We also included examples of /a/ before /z/ in unstressed position, e.g. *rasâ* [ra'za] 'to shave'. For each context there were normally sixteen tokens (eight per speaker) available for subsequent analysis.

After recordings were completed, vowel and post-vocalic consonant durations for each token were then measured and recorded using Praat. Simple statistical analysis (t-tests) was then carried out and results are reported below where appropriate.

## 5. Results

### 5.1. Vowel and consonant duration in stressed open syllables

We first calculated duration values for the vowel /a/ and post-vocalic consonants in stressed open syllables, in order to establish what differences, if any, might arise according to the nature and type of the following consonant. Results are presented in Table 1.

Vowel duration was substantially greater before /z/ than before all other consonants, at 81 ms. above the global average. Pairwise comparisons confirm that the difference between vowel duration before /z/ and before other obstruents in the sample is always highly significant ( $p < 0.005$ ).

The presence or absence of voicing in the post-vocalic consonant also had a predictable effect (e.g. Chen 1970) with noticeably longer vowels before voiced consonants. The greatest difference (132ms.) in vowel duration occurred in the case of /z s/, whilst the smallest difference (34ms.) involved labiodental /v f/. For each voiced-voiceless pair, the difference in vowel duration is highly significant ( $p < 0.005$ ).

## 6. Discussion

	vowel	SD	consonant	SD
/z/	309	47	104	20
/s/	177	34	175	16
/v/	228	50	90	20
/f/	194	35	147	24
/d/	233	42	82	21
/t/	165	29	132	27
All C	218	40	122	21

*Table 1.* Average duration values (ms.) and standard deviations for the vowel /a/ in penultimate stressed open syllables and for the following consonant for 2 speakers of Friulian.

With respect to consonant manner of articulation (stop v. fricative), the effect on vowel duration did not appear to be consistent. Vowels are much longer before fricative /z/ than before stop /d/ ( $p < 0.005$ ). Yet similar duration values were noted before /d/ and /v/. On the other hand, vowels tended to be slightly longer before fricative /f/ than before either fricative /s/ and stop /t/.

Consonant place also did not appear to have a consistent effect: while vowels are much longer before alveodental /z/ than before labiodental /v/ ( $p < 0.005$ ), vowel duration values are higher before /f/ than before /s/.

If we turn our attention to consonant duration, voiceless obstruents are all longer than their voiced counterparts, with the highest value reported for /s/. The difference in duration in the case of each pair is highly significant ( $p < 0.005$ ). Place of articulation seems have a weaker effect on consonant duration: labiodental /v f/ are shorter than alveodental /z s/. Regarding the interaction between manner and consonant duration, voiced fricatives /z s v/ and voiceless /f/ are longer than their stop counterparts /d/ and /t/ respectively. The difference in duration between /z/ and /d/ is highly significant ( $p < 0.005$ ).

### 5.2. Vowel and consonant duration in stressed and unstressed penultimate open syllables

In Table 2 we present average duration values for unstressed and stressed /a/ in penultimate open syllables and for the following consonant /z/. We note the very significant increase in vowel duration in stressed position (+142ms.,  $p < 0.005$ ), while there is little or no difference in the duration of /z/ across stress conditions.

		vowel	SD	consonant	SD
unstressed	/z/	167	20	112	16
stressed	/z/	309	47	104	20

*Table 2.* Average duration values (ms.) and standard deviations for the vowel /a/ in penultimate open syllables and for the following consonant /z/ in unstressed and stressed conditions for 2 speakers of Friulian.

Our vowel duration results indicate that in word-medial stressed position, the vowel /a/ is considerably longer before /z/ than before all other consonants in our sample regardless of voicing, place, or manner. The extent of the difference is such that vowels in the former context should be considered long.

Separately, we also see that the presence or absence of stress interacts strongly with vowel duration before /z/ and provides further support for the notion that word-medial stressed vowels are indeed long before intervocalic /z/ – as already suggested by our auditory observation and transcribed examples taken from other sources.

In stressed position, the lengthening effect of /z/ on the preceding vowel seems to be greater than that of other more general consonant-dependent effects, such as voicing, manner and place, known to impact on pre-consonantal vowel duration in other languages (e.g. Chen 1970). Of these three factors, the voiced – voiceless distinction appears to have the most consistent and reliable effect on stressed vowel duration in Friulian. However, even here the increase before /z/ relative to /s/ and in comparison with other voiced – voiceless pairs is much greater than reported for other languages, e.g. Spanish (Lehiste 1970) and English (Peterson & Lehiste 1960). Manner and place seem to have a less consistent effect, particularly if /z/ is excluded from general comparisons. If we compare our results with those reported for standard Italian, Esposito (2002) and others have also found differences in consonant voicing and place interact with stressed vowel duration in that language. Unfortunately, further direct comparison is difficult, given substantial methodological differences across all of these studies.

With respect to the presence or absence of stress, the duration of /a/ before /z/ is 85% higher when stressed. On this difference alone, stressed vowels before /z/, in particular, should be treated as long when compared to their unstressed counterparts. From a wider regional perspective this increase is not a surprising result: as previously noted in §3, unstressed vowels in Friulian and elsewhere in Italy are always short. This effect of stress-conditioned lengthening has not previously been noted for Friulian but confirms that the same general pattern of vowel lengthening in stressed open penultimate syllables also applies in that language, at least before /z/. In standard Italian there is predictable lengthening of all stressed vowels in penultimate open syllables, e.g. /fato/ ['fa:to] 'fate' v. /fatto/ ['fatto] 'fact' (Hajek 1997, 2000). There are no reports of a specific vowel duration effect associated with the voiced alveodental [z] (the normally expected intervocalic allophone for /s/ in that language). On this point then, Friulian may be different from standard Italian. However, we remain speculative, and further investigation is first needed to determine whether a similar stress-conditioned vowel duration effect also occurs before other word-medial consonants in Friulian.

The duration of /z/ across stress conditions is stable and shows none of the same elasticity seen in the pre-consonantal vowel. This is likely a syllabification effect: intervocalic consonants are assigned to the onset of the following syllable in all cases, while stress-conditioned lengthening is restricted to the preceding vowel-final syllable.

The extent to which vowel lengthening in word-medial stressed syllables may be conditioned specifically by /z/ in

Friulian remains unclear. While factors such as consonant voicing and stress are also seen to have a consistent effect on vowel duration, they appear insufficient in themselves to fully account for the effect we report before /z/ in stressed position. Further investigation is required for us to better understand the weight and manner of interaction of all of these factors.

## 7. Conclusions

Overall, the results of this study support the hypothesis that vowels in stressed word-medial syllables are lengthened before /z/ in Friulian, when compared to vowels before other obstruents. They are also long when compared to their unstressed counterparts, consistent with our own perceptual evaluation reported in §1.

Consonant voicing and stress position are also seen to predictably condition vowel duration before /z/, but they do not seem sufficient in themselves to account for the elevated effect observed before /z/.

Given our results, phonological and phonetic descriptions of vowel length in Friulian should now be modified to reflect the fact that vowels are predictably lengthened, i.e. long, in word-medial stressed syllables before /z/, e.g. /raze/ [ra:ze]. From a phonological perspective, we note the previously mentioned parallel of a predictable process of final-syllable lengthening associated with obstruent devoicing, e.g. /lad/ > [la:t] 'gone' (m.sg). Given that this is captured by rule in phonological treatments of Friulian, similar could also be done for lengthening before intervocalic /z/. The question remains open as to whether this lengthening also needs to be explicitly marked in the orthography, given its entirely predictable nature and the absence of any potential confusion with a short stressed vowel in the same non-final context.

## 8. References

- Baroni, M. & L. Vanelli (2000). The relationship between vowel length and consonantal voicing in Friulian. In Repetti, L. (Ed). *Phonological Theory and the Dialects of Italy*, pp.13-44. Amsterdam: John Benjamins.
- Chen, M. (1970). Vowel length variation as function of the voicing of the consonant environment. *Phonetica* 22: 129-159.
- Esposito, A. (2002). On vowel height and consonantal voicing effects: Data from Italian. *Phonetica* 59: 197-231
- Farnetani, E. & S. Kori (1986). Effects of syllable and word structure on segmental durations in spoken Italian. *Speech Communication* 5: 17-34.
- Frau, G. (1984). *Friuli*. Pisa: Pacini.
- Goldberg, J. R. (1985-1987). A comparison of the Standard Friulian Vowel System with that of the Rivignano dialect. *Orbis* 35: 141-146.
- Hajek, J. (1997). *Universals of Sound Change in Nasalization*. Oxford: Blackwell.
- Hajek, J. (2000). How many moras? Overlength and maximal moraicity in Italy? In Repetti, L. (Ed.). *Phonological Theory and the Dialects of Italy*, pp.111-135. Amsterdam: John Benjamins.
- Hualde, J. I. (1990). Compensatory lengthening in Friulian. *Probus* 2: 31-46.
- Lehiste, I. (1970). *Suprasegmentals*. Cambridge, MA: MIT Press.
- Osservatori = Osservatori regionâl lenghe e de culture furlanis (1999). *La grafie uficiâl de lenghe furlane*. Fiume Veneto: GEAP Print.
- Peterson, G. E. & I. Lehiste (1960) Duration of syllable nuclei in English. *Journal of the Acoustical Society of America* 32: 693-703.
- Vanelli, L. (2005). Le vocali lunghe del friulano. In Benincà, P. & Vanelli, L. (Eds.) *Linguistica friulana*, pp.159-198. Padua: Unipress.