

QUESTION INTONATION IN SIENESE ITALIAN

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ABSTRACT

In recent years, the intonation of spoken Italian has been studied not only with reference to Standard Italian, but also to some regional varieties. This paper concerns the analysis of question intonation in the variety of Italian spoken in Siena (Tuscany). In particular, wh-questions and yes-no questions are investigated. The analysis is based on a corpus of spontaneous speech and read dialogues produced by three young speakers. The intonation patterns of questions are analyzed according to the autosegmental theory.

In Sieneese speech, interrogative intonation exhibits pitch accents and boundary tones which are different from other varieties of Italian. On the other hand, Sieneese wh-questions and yes-no questions differ one another in their prosodic patterns.

1. INTRODUCTION

In Italian, intonation plays a leading role in expressing the interrogative modality. In this language, no syntactic or morphological cues differentiate between yes-no questions (or echo questions) and declarative sentences. Therefore, the illocutive force of the question is wholly expressed by means of intonation.

According to Chapallaz [1], the melodic patterns of Italian questions are essentially two:

- a) fall for wh-questions;
- b) fall-rise for yes-no questions.

These intonation contours have been substantially confirmed by Avesani [2] and Sorianello [3] for Tuscan Italian. However, as far as yes-no questions are concerned, other authors [4, 5, 6] have recently published empirical research which does not conform to this pattern.

In the present study, the theoretical and methodological framework of Intonational Phonology is adopted [7, 8, 9, 10, 11] and the prosodic transcription system used is ToBI [12]. As is widely known, within this framework, intonation is considered as a string of two tone levels: Low (L) and High (H). The tonal categories of every natural language are: a) pitch accents (henceforth PA), i.e. mono- or bitonal sequences of tones occurring on a stressed syllable (T*), and b) peripheral tones, as occurring at the edge of the prosodic constituents, i.e. the phrase accent (T-) and the boundary tone (T%), located respectively at the end of the intermediate and the intonational phrase.

2. METHOD

The three hundred utterances analyzed were extracted from a corpus composed of spontaneous speech produced during informal conversations and dialogues which were read out aloud.

Three non professional native speakers of Sieneese Italian were chosen for speech recordings. These were University students, two females and a male, between 25 and

30 years olds. For each utterance, the following acoustic parameters were analyzed: pitch contour, Fo onset and offset values, Fo range (i. e. the distance between the lowest and the highest Fo value in the same utterance), and the duration of the nuclear vowel.

Speech material was digitized at 22 kHz sampling rate with a DSP SonaGraph 5500 (Kay Elemetrics). The acoustic analysis was carried out employing broad and narrow spectrograms, waveform displays and Fo contours.

The software used were Signalyze 3.10 (InfoSignalTM Inc.) and Multispeech (Kay Elemetrics).

3. WH-QUESTIONS

The most common intonational pattern of Sieneese wh-questions consists of three elements:

- 1) a local Fo maximum, not always located on the interrogative morpheme;
- 2) a sharp drop on the following syllables;
- 3) a final rise or fall.

The nuclear PA is H* (85%), a tone involving a high pitch target on the stressed syllable (cf. Table 1).

The Fo maximum, reached around the middle of the nuclear syllable, is maintained for the whole of the syllable's duration. Hence a rapid decrease associated with the phrase accent L- is observed (see Figure 1). The frequency distance between H* and L- expressed in semitones (henceforth ST), is about 8.3 ($\sigma = 1.1$). The pitch remains low until the last syllable, where it rises by around 3 ST ($\sigma = 0.9$), thus showing a H% boundary tone.

In 70% of the questions spoken in read speech, the melodic contour shows a high boundary tone H%. In spontaneous speech, on the other hand, the peripheral sequence L-H% is absent. In general (60%), boundary tones are both low, namely L-L%, since a sharp decrease after nuclear PA is produced without any rise at the end of the utterance. This final contour (L-L%) alternates with H-L% (40%), a pitch movement where the previous tone H* is sustained. In this case, L% does not reach the bottom of Fo range, as happens in L-L% sequence.

SIENESE ITALIAN			
wh-questions	Tones	read speech	spontaneous speech
Nuclear pitch accent	H*	85%	100%
	H+L*	15%	--
	H*+L	--	--
	L+H*	--	--
	L*+H	--	--
	L*	--	--

Boundary tones	L-L%	30%	60%
	L-H%	70%	--
	H-L%	--	40%
	H-H%	--	--

Table 1: Nuclear PA and boundary tones in Siense wh-questions in read and spontaneous speech.

The wh-morpheme may coincide with the tonal nucleus, or most prominent word of the utterance (e.g. *Ma dov'è Antonio?* "But where is Antonio?"), or it may not (e.g. *Quanto ci vuole per arrivare?* "How long does it take to us to get there?").

Length of utterance and nucleus placement are strictly related. When the wh-element occurs in the initial position of a long utterance, nuclear pitch accent is mostly on the last stressed syllable of the question. Ladd [11: 170 ff.] has already noticed that in languages like English and Italian, the wh-word is not always the most prominent word of an interrogative utterance, although it might display the highest pitch.

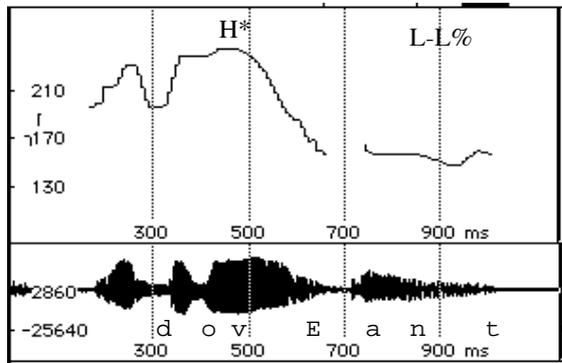


Figure 1: Fo contour and waveform of the utterance *Ma dov'è Antonio?* "But where is Antonio?" produced by a female Siense speaker (BC).

According to the data, the interrogative morpheme generally shows a certain degree of prosodic prominence. Nevertheless, a second PA may be found at the end of the question, especially in long utterances. This final PA has a lower Fo value than the pitch occurring on the wh-word, but perceptually it is more salient than the former. The reason is probably that in Italian duration plays a primary role in the assignment of prominence. As expected, the stressed vowel of the final nuclear PA lengthens so as finally to measure over 140 ms. on average. However, duration alone cannot explain the perceptual prominence of the final PA, since the lengthening effect at the end of the utterance is present in all the utterances.

It was also seen that some wh-words are more closely associated than others with the nuclear PA. *Ceteris paribus* (i.e. same length of utterance, similar syntactic structure, etc.), *perché* ("why") shows the H* PA much more than *chi* ("who"), *che* ("what") or *dove* ("where"). Very often, these latter wh-elements are completely deaccented, as their amplitude and length indicate.

4. YES-NO QUESTIONS

In Siense read speech, the great majority of yes-no questions are characterized by a nuclear pattern which may be phonologically transcribed as H+L* L- H% (cf. Table 2). There is a double change in tonal level: from high to low and again from low to high.

The nuclear syllable shows a bitonal PA (H+L*). Very often, the Fo peak starts on the previous unstressed syllable; the maximum value is maintained until the onset of the stressed syllable. Hence, the contour observed is immediately that of a fall. As a consequence, the nuclear syllable exhibits both a local maximum and a local minimum in Fo.

SIENESE ITALIAN			
Yes-no questions	Tones	read speech	spontaneous speech
Nuclear pitch accent	H*	8%	28%
	H+L*	92%	54%
	H*+L	--	--
	L+H*	--	18%
	L*+H	--	--
Boundary tones	L-L%	36%	23%
	L-H%	64%	51%
	H-L%	--	26%
	H-H%	--	--

Table 2: Nuclear PA and boundary tones in Siense yes-no-questions in read and spontaneous speech.

The nuclear syllable is associated with the low tone of the sequence H+L*, given that the H tone is aligned with the beginning only of the stressed syllable, while the L tone is aligned with almost the whole nucleus. The pitch movement within the nuclear syllable is one of abrupt decrease (cf. Figure 2). The falling movement covers an interval ranging from 2 to 5 ST. The minimum value reached around the middle of the stressed syllable spans the postnuclear syllables to reach the terminal rise, when this is present.

Spontaneous speech exhibits greater variability with respect to PA typology. L+H* and H* co-occur with the more frequent H+L*. In particular, in the case of very short questions, we find only H* (28%).

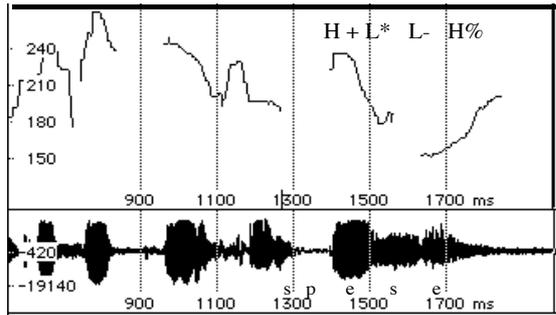


Figure 2: *F₀ contour and relative waveform of the utterance **Anche te qui a fa' spese?** "You doing your shopping here too, then?" produced by a female Sienese speaker (AV).*

In this kind of question the most frequent boundary tones are L-H% (64% in read dialogues; 51% in spontaneous speech). On average, the difference between these two edge tones is 3 ST. If we also consider the tonal combination H-L%, which occurs in 26% of spontaneous speech, we may conclude that in Siena yes-no questions, terminal rise is fairly constant (77%). Nevertheless, a falling contour is also possible, although less frequent (only 23% in spontaneous speech, but 36% in read speech). Though falling, the pitch contour does not reach the baseline, since it remains above it by about 3 ST. Therefore, a raised baseline may represent a specific marker for interrogation. This explains why a question with a final falling contour is never perceived as an assertive utterance.

5. DISCUSSION

The two classes of question show different behaviour as far as nuclear PA and boundary tones are concerned. Wh-questions make use of a H* nuclear PA, whereas yes-no questions show a bitonal PA, i.e. H+L*. Boundary tones are different too, since they normally fall in wh-questions (L-L%), but clearly rise (L-H% or H-L%) in yes-no questions.

Both questions are distinct from statements. Declarative utterances with unmarked intonation exhibit a falling nuclear configuration, L*L-L% or H+L*L-L%. The PA H+L* was observed in yes-no questions too. However, the phonological distinction is guaranteed by the boundary tones, which fall in statements (L-L%), but rise in polar questions (L-H% or H-L%). Furthermore, we note that the typical nuclear PA of Sienese statements (i.e. L*) never occurs in wh-questions.

The position of the tonal nucleus in the utterance represents another feature differentiating wh- and yes-no questions. In wh-questions the placement of nuclear PA seems mainly to depend on the length of the utterance. As already mentioned, when the question is short, the tonal nucleus is normally located on the stressed syllable of the wh-element. If the utterance is relatively long, then it moves toward the final word. This points to a significant positive correlation between the length of utterance and the location of nuclear PA.

In this regard, yes-no questions behave differently. The nuclear PA always occurs on the last stressed syllable of the question, whatever the length of utterance. The nucleus

placement determines vowel duration. In other words, the length of the nuclear vowel depends on its position within the utterance: if the nucleus is located at the end of the question, the vowel is considerably lengthened, reaching a total of 140 ms. or more. On the other hand, if the nuclear vowel is placed early, a shorter length is recorded.

However, the intonational pattern of wh-questions is not completely different from that of yes-no questions. The whole set of interrogatives seems to behave similarly so far as pitch range is concerned. The two classes of questions share high onset and offset values, i.e. the initial and the final F₀ values respectively. This means that a raised baseline occurs in questions, as compared with statements (cf. [13]).

In the data collected, it is not unusual to find a question produced at a uniformly high pitch level, leading to a highly reduced pitch range. This does not imply that the overall pitch range is always low. We find utterances with a pitch range exceeding an octave (i.e. 13-15 ST), and utterances with a very reduced range (3-5 ST). In spontaneous speech, questions show greater variability. No remarkable differences between wh- and polar questions were observed in this respect.

It seems likely that this high frequency range contributes to the melodic identity of interrogation, especially in those cases where the question displays a falling terminal contour.

In Italian the final part of F₀ contour, usually considered as rising, is regarded as carrying the illocutive information necessary to differentiate interrogative from assertive sentences. Yet, the terminal contour would seem less relevant as feature of interrogation than has been thought. In particular, it should be pointed out that the lack of a final rise in yes-no questions was confirmed by earlier autosegmental work relating to several southern varieties of Italian (e.g. Cosenza [3], Palermo [4], Bari [5] and Naples [6]). Unlike what happens in Sienese Italian, the experimental findings for these regional varieties demonstrate that the terminal pattern of yes-no questions is always that of a fall. However, an interrogative meaning is ensured by the configuration of the nuclear PA, in general L+H* (but L*+H in Palermo Italian).

The difference between Sienese and southern varieties of Italian pitch accents does not concern a different alignment of the tone levels, with regard to the boundaries of the nuclear syllable, but rather a diametrically opposed sequence of tones: H+L in Sienese Italian, L+H in Southern Italian.

A final theoretical point which requires mentioning concerns the phrase accent. Its status has already been challenged in literature [14, 15]. The experimental data collected for Sienese Italian do not provide strong evidence in favour of the obligatoriness of such a tonal category.

A falling contour was often found in the final part of the utterance, making the tonal transcription L-L% redundant. In the case of short utterances, in particular, the boundary tone (T%) alone is able to capture the whole final pitch movement. In the case of a final rise, H-L% may be ambiguous, as referring to an increase of F₀ which may or may not include the final syllable. At the same time, the alignment of both the edge tones with the postnuclear segments is not always clear. Finally, when the

transcription L-H% was used, the L- notation makes reference to what might be expected, a decrease of F₀ corresponding to the general falling contour of the pitch. Only the high boundary tone aligned with the final syllable is phonological.

It is thus questionable whether the phrase accent should still be considered an obligatory tone. We would like to propose the use of phrase accent notation only when specific cues (phonetic, pragmatic or syntactic) do manifest it. Otherwise, the identity of phrase accent on the one hand and boundary tone on the other might be assumed as default.

6. CONCLUSION

The results obtained provide preliminary evidence that the syntactic difference between statements and wh- and yes-no questions is phonologically expressed by different PA. Moreover, the experimental data suggest that in Siene Italian a terminal rise is not shared by all interrogative utterances, but only by yes-no questions, at least in spontaneous speech.

In this respect, it should be pointed out that in the corpus collected for Siena, alternative questions, echo questions, and tag-questions show a falling terminal contour as well. The phonetic analysis carried out on these other classes of interrogative sentences has not confirmed the occurrence of postnuclear high syllables. Only yes-no questions show a final rise. The perceptual impression of higher frequency is due to the nuclear PA rather than to the boundary tones.

Further research is needed in order to broaden our knowledge of the prosodic aspects of the interrogative modality in a wider range of varieties of Italian.

NOTE

This paper was jointly developed by the two authors. However, G.M. must be considered responsible for sections 4,5,6 and P.S. for sections 1,2,3.

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