

The intonation of Albanian polar questions and statements

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Abstract

This study aims to provide an account of the effects of sentence type (statements vs. polar questions) on Standard Albanian prenuclear rises through a polynomial model representing the dynamic characteristics of tonal contours. Results show that the main difference in contour shape between Albanian statements and polar questions is located in the shape of the prenuclear rise, and this difference was significant; onset timing of the prenuclear rise, however, did not differ significantly between the two types of sentence.

Keywords: Albanian, intonation, statements, questions.

Introduction

The tonal curve consists of tonal events such as peaks and troughs that are perceived as pitch rises and falls. These tonal events convey informational meaning (e.g., focus and topic) or manifest sentence types (e.g., statements, questions, etc.) (Botinis, Granström & Bernd, 2001). There has been considerable research on Albanian segments, yet studies on Albanian intonation are sparse (see, however, Manzini & Savoia, 2007; Memushaj, 2009). By employing a polynomial model that represents the dynamic characteristics of Albanian tonal contours, this study is to our knowledge the first account of the effects of sentence type (statements and polar questions) on prenuclear rises in Standard Albanian.

Method

Data for this study were gathered in March 2015 by the second author in Tirana, the capital of Albania. Ten Standard Albanian speakers (8 male, 2 female) in their mid-twenties born and raised in the broader Tirana area participated in the study. The speech materials consist of the phrase *Melina nominon Milonin* ('Melina nominates Milon') uttered as a statement and as a polar question. Question-answer pairs between the speaker and one of the two Albanian student assistants facilitated the elicitation of narrow focus. Speakers wore a head-mounted microphone connected to a H4n Handy Recorder

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(Zoom Corporation, Tokyo, Japan) and were recorded in a quiet room at a 44100 Hz sampling frequency. All tokens obtained from the eight male speakers were used for the acoustic analysis (data from the female participants were obtained for a separate study). The first peak of each utterance was selected from a local minimum up to a following local minimum and analysed.

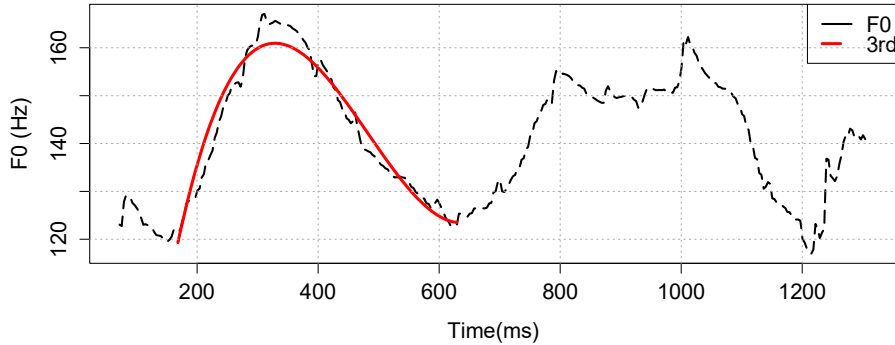


Figure 1. Tonal contour of the utterance *Melina nominon Milonin* uttered with narrow focus on the rightmost constituent by a male speaker of Albanian. The pre-nuclear peak is fitted with a 3rd degree polynomial (red line).

To provide the best fit to time-frequency samples from each tonal contour, a polynomial curve fitting method was used (see Figure 1). The resulting N^{th} degree polynomial is given by:

$$(1) \quad f_{(m)}(t) = a_{0,m} + a_{1,m}t + a_{2,m}t^2 + \dots + a_{N,m}t^N$$

where t is time. The index $m=1, \dots, M$ represents the tonal contours approximated with curve fitting. Moreover, the distance between the beginning of the rise, i.e. the first low and the onset of the stressed syllable was measured. Note that the timing of the peak and the end of the rise are determined by the polynomial model. A t -test was conducted on the polynomial coefficients. Sentence type (statement vs. question) was entered into the model as an independent variable; we fitted a 3rd degree polynomial. The statistical analysis was carried out in R 3.0.2 (R Core Team, 2012).

Results

i. The overall contour. In both statements and questions, an f_0 rise-fall associates with the stressed syllable. The rise begins at a local minimum at the left edge of the stressed onset consonant and the peak aligns inside the post-

stressed vowel (see Figure 2). In statements, the nuclear pitch accent associates with a peak, whereas in polar questions, the nuclear pitch accent associates with a local minimum of the f_0 . The polar question contour ends in an f_0 rise.

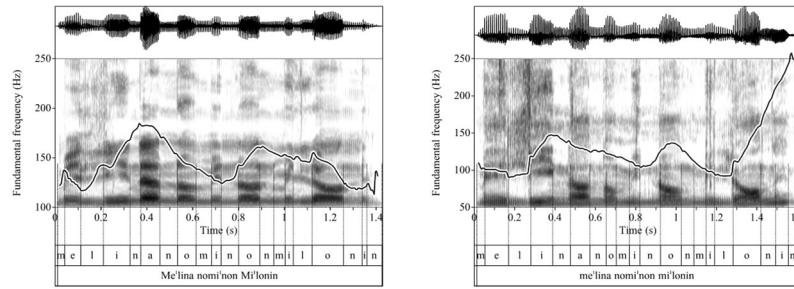


Figure 2. Tonal contour of the utterance *Melina nominon Milonin* uttered as a statement (left) and as a polar question (right) by a male speaker of Standard Albanian.

ii. Pre-nuclear peaks. Figure 3 shows the output of the curve fitting for the male participants. Overall, a *t*-test showed that questions vs. statements (*sentence type*) do not differ in their starting frequency estimated by the zeroth coefficient (a_0); there were also non-significant effects for the a_2 and a_3 coefficients. *Sentence type* had, however, significant effects on a_1 ($t(1) = 5.814$, $p < .05$).

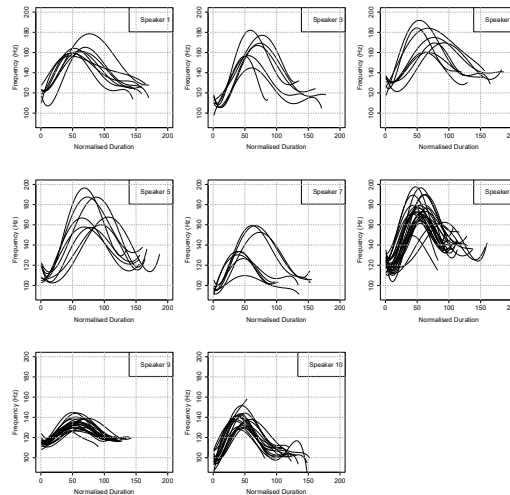


Figure 3. Fitted lines of the first prenuclear peaks for each male speaker.

iii. *Timing of pre-nuclear peaks.* In both statements and polar questions, an f_0 rise-fall begins at a local minimum at the left edge of the onset consonant of the stressed syllable and the peak aligns inside the post-stressed vowel. There was no significant difference between polar questions and statements with respect to the beginning of the prenuclear rise.

Discussion

This study used a polynomial model representing the dynamic characteristics of Albanian tonal contours in order to account for the effects of sentence type (statement vs. polar question) on Standard Albanian prenuclear rises. The results show that statements and questions differ significantly in the first coefficient, which determines the prenuclear rise; this difference lies in the pitch range and slope of the rise. By contrast, the starting frequency of questions and statements was not significantly different. Overall, the local minimum of the prenuclear pitch accent is timed with respect to the syllable onset. The timing of the peak and the timing of the end of the rise are determined by the polynomial model. Therefore, by requiring only one anchoring point for the pitch accent, this model provides a more parsimonious account of pitch accent timing than models which require specifications for both the local minimum and the peak (see Ladd, 2008 for a review). As far as we are aware, this study provides the first model of prenuclear accents in Standard Albanian statements and polar questions.

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