Contact intonation: the case of Asia Minor Greek

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1. Introduction

Language contact affects the lexicon, grammar and pronunciation [1]. There is little work on the impact of language contact on intonation change. In Asia Minor, Greek and Turkish speakers cohabited for centuries, until 1923 (The Treaty of Lausanne).

2. Research questions

Broader: How does language contact shape intonation?

Here: Compare the polar and continuation tunes in Athenian Greek, Cappadocian Greek (AMG) and Turkish.

3. Materials and method

- Natural speech corpus: audio recordings of Athenian (312 utterances), AMG (737) and Turkish (484).
- f_0 was measured every 10 ms using ESPS *get_f0.* 10th-order polynomials $\hat{f}_0 = \Sigma a_n t^n$ were fitted to f_0 contours using GNU Octave *polyfit* function; pitch errors were inspected and corrected. Maxima and minima were calculated from the roots of the derivative $d\hat{f}_0/dt$.
- Phonological landmarks in the standard AM model [2, 3] were used as guidelines for delimiting regions of interest (r.o.i.):
  - Polars: from the $\hat{f}_0$ trough before /ml/ to the utterance end (Turkish); from the nuclear L* trough to the utterance end (Greek).
  - Continuation rises: from the $\hat{f}_0$ trough before the final lexical stress to the end (Turkish); from the $\hat{f}_0$ minimum before the nuclear stress to the phrase end (Greek).
- f_0 contours in the r.o.i. were modelled as 4th-order *orthogonal* (Legendre) polynomials [4].
- Alignment measures. *Polars*: Δt between first $\hat{f}_0$ peak in r.o.i. and start time of relevant vowel. *Continuation rises*: Δt between initial $\hat{f}_0$ minimum (beginning of the near-final rise) and the beginning of the nuclear stressed vowel (Greek) or final lexical-stressed vowel (Turkish).
- Statistical significance of differences between the varieties was tested using t-tests.

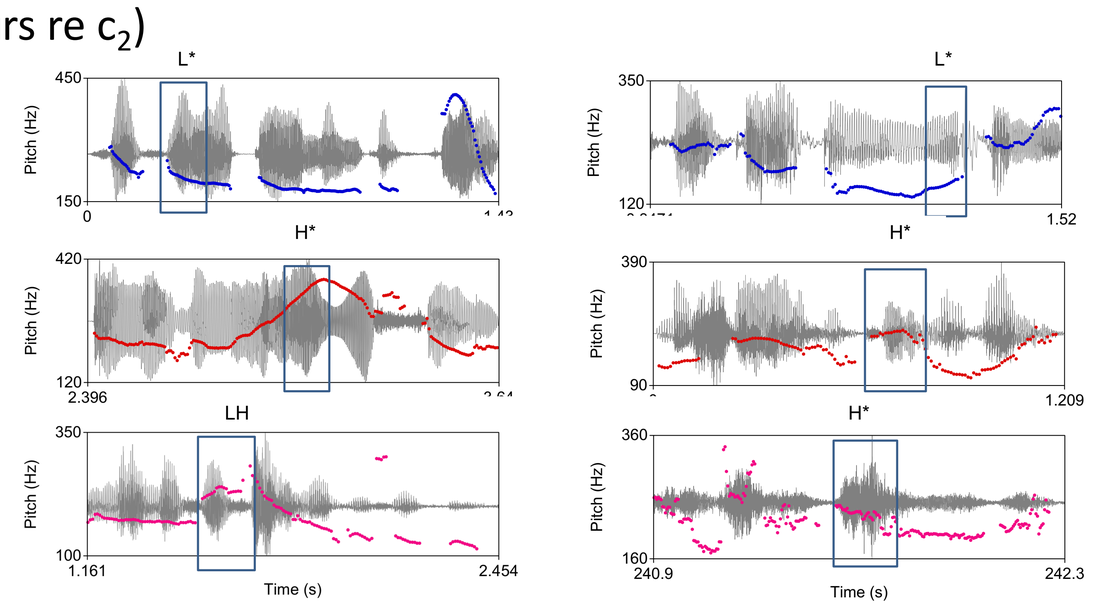
4. Illustrations (median contours re c_2)

Polar tunes **Continuation tunes**

In Athenian L* LH- L% [5, 6], the nucleus aligns with a trough, e.g. [θa ˈθelate ˈenaŋ kaˈfe] '*Would you like a coffee?*'

In Turkish, the nuclear word before the question particle /ml/ ends in a peak [7, 8], e.g. [biliˈjor muˈsun] '*Do you know?*'

Like Turkish, AMG aligns the nuclear syllable with a rise (LH), e.g. [monaˈʃis taˈemaθes aˈfta] '*Did you learn these on your own?*'



In Athenian L* L-H% [9], the nucleus aligns with a trough and it is followed by a rise, e.g. [triˈada ˈatoma muˈipane] '*Thirty people told me…*'

In Turkish, the H* on the nuclear word is followed by a LH- [10], e.g. [maˈsaja oˈturmadan] '*Before sitting at the table…*'

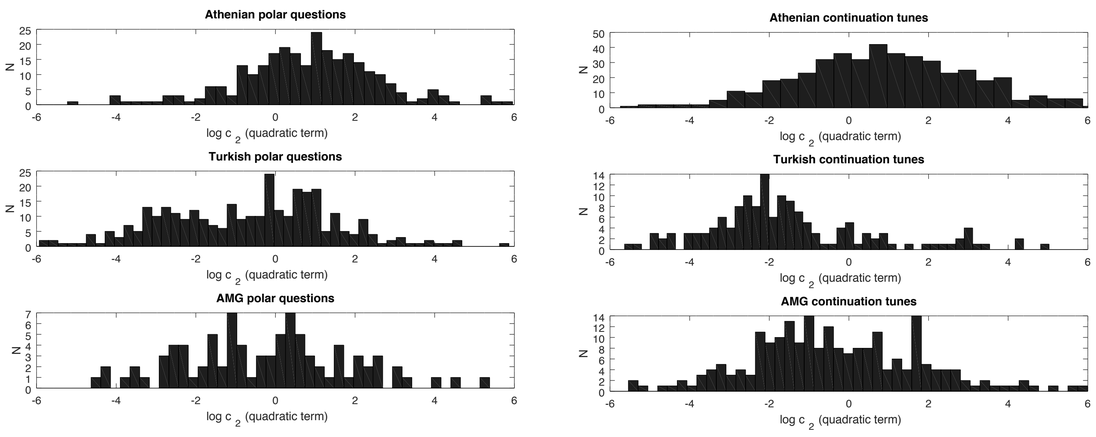
In AMG, like in Turkish, the H* on the nuclear word is followed by a LH-, e.g. [du ˈscafus ˈkahumisti] '*We sit in their shadow…*'

5. Shape characteristics (based on the linear and quadratic polynomial coefficients)

Athenian: downward slope, concave upwards rise from an L* near the end.

Turkish: upward slope, concave downward pre-final rise-fall.

AMG: Like Turkish, upward slope, concave pre-final rise-fall (near-final H peak).



Athenian: c_2 is positive -- concave upwards, final rise.

Turkish: c_2 is negative, concave downwards.

AMG: distribution of c_2 is in-between Athenian and Turkish, i.e. a mixture of both. AMG has a far higher proportion of negative c_2's than Athenian, i.e. rise-falls, like Turkish, but also has many positive c_2's, like Athenian.

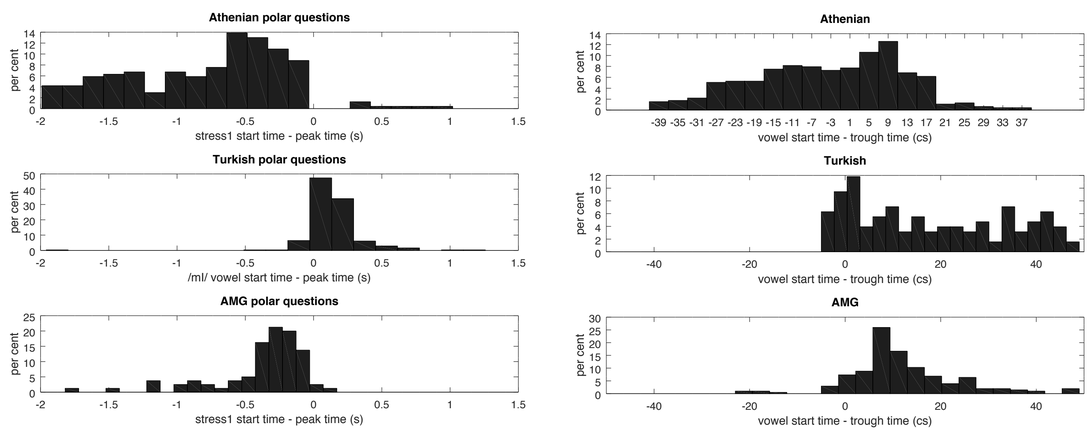
6. Alignment

f_0 peak and stressed vowel f_0 trough and stressed vowel

Athenian: The vowel is generally located at least 2 syllables before the final peak.

Turkish: The /ml/ vowel and the peak are tightly coupled; lexical stress is marginally earlier

AMG: The vowel in general is very near the final peak. The timing is similar to Turkish.



Athenian: The timing of the trough varies widely. The nuclear stressed vowel often comes well before the pre-final trough time.

Turkish and AMG: The start of the stressed vowel is generally about 1 or 2 syllables after the start of the pre-final rise.

7. Discussion

The shape and alignment details of AMG tunes look more like Turkish than Athenian.

Polar questions are dissimilar in Greek and Turkish. In Turkish, the nuclear peak aligns with the stressed syllable before the question morpheme (/ml/), but no such morpheme exists in Greek. In Athenian, there is a trough on the nuclear syllable. In **continuation rises,** there is a trough on the nuclear vowel in Athenian, but a peak in Turkish.

These findings suggest that in both polars and continuation rises, AMG resembles Turkish both in the nuclear shape and the location of the peak. Also like Turkish, AMG aligns an H pitch with the stressed syllable, as opposed to Athenian, where there is an L on the stressed syllable.

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References

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http://www.phon.ox.ac.uk/greekincontact