

Intonation patterns of interrogative constructions in Ixpantepec Nieves Tu'un Savi (Mixtec)

Ixpantepec Nieves Tu'un Savi (INTS) is an Oto-Manguean language of the Southern Mixteca Baja dialect group of the Mixtecan branch (Josserand 1983), spoken in Oaxaca, Mexico, and in diaspora communities in Mexico and the United States. As documented for other Mixtec languages (e.g., Ayutla Mixtec (Pankratz and Pike 1967) and Diuxi Mixtec (Pike and Oram 1976)), INTS possesses a complex word prosodic system featuring both a lexical tone system (H, M=/ø/ and L) as well as word-level stress (Carroll 2013). While the word prosodic properties of Mixtec languages have continued to be discussed in recent literature (e.g. de Lacy 2003, Daly & Hyman 2007), it has not yet been investigated whether these languages deploy F0 intonationally. Through analysis of original data obtained through field research and as part of a larger project documenting the phonological properties of INTS, we seek to fill this gap by investigating the prosody of interrogative constructions in this language. More broadly, our project seeks to contribute to the typology of tone/pitch-accent-intonation interactions in languages of the Americas (e.g., Gordon 1999, 2007; Holton 2005; McDonough 2002).

We collected data on the realization of intonation patterns of both polar and wh-questions with two native speakers of INTS (one female, one male) in San Diego, California. In order to assess the prosodic properties of polar questions, we carried out a quantitative analysis of 41 question-answer pairs recorded with a female speaker two times each. VSO word order, the proposed basic word order (Macaulay 2003; Caponigro et al. 2013) was presented, and the object of transitive verb phrases was altered based on lexical tone in order to see if any different intonational tone patterns would emerge:

- (1) Q: ā nì-sāʔnī kótʃi kòò?
 INT PERF-kill.REALIS pig serpent
 'Did the pig kill the serpent?'
 (2) Q: ā nì sāʔnīrí kótʃi núpú?
 INT PERF-kill.REALIS=3sg.animal pig chameleon
 'Did the pig kill the chameleon?'
 (3) A: xāāā kótʃi nì sāʔnīrí núpú.
 yes pig PERF-kill.REALIS=3sg.animal chameleon
 'Yes, the pig killed the chameleon.'

Examples (1) and (2) differ in the tones of objects; the object of (1) has LL tones, while that of (2) has HH tones.

In INTS, roots are bimoraic (CVV or CVCV), and the TBU is the mora. Our object targets represented only a subset of the possible tonal melodies per root type from the language: LL, MM, and HH. The pitch contours of the polar question-answer pairs were compared directly to see if any differences existed between the pairs. Specifically, the pitch (F0) was measured at the midpoint of every vowel to obtain the pitch contour in order to determine if lexical tones and intonation interact; i.e., if pitch raising (higher F0 overall) and pitch expansion (greater F0 range overall) exists. Overall, the only intonational event that was found to be significantly different across polar question-answer pairs was **pitch raising** ($p < 0.01$). Therefore, in polar questions both high and low lexical tones have higher F0.

For wh-questions, a qualitative analysis of question-answer pairs was carried out using interview data from a male and female speaker:

- (4) Q: zòò nì kānānā xúān
 who PERF.call.REALIS Juan 'Who called Juan?'
 A: māríá nì kānānā xúān
 Maria PERF.call.REALIS Juan 'Maria called Juan.'

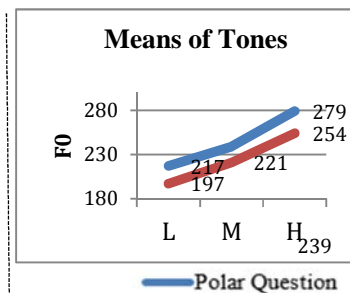


Figure 1. Means of tones (L, M, H) across sentence type (polar question vs. declarative).

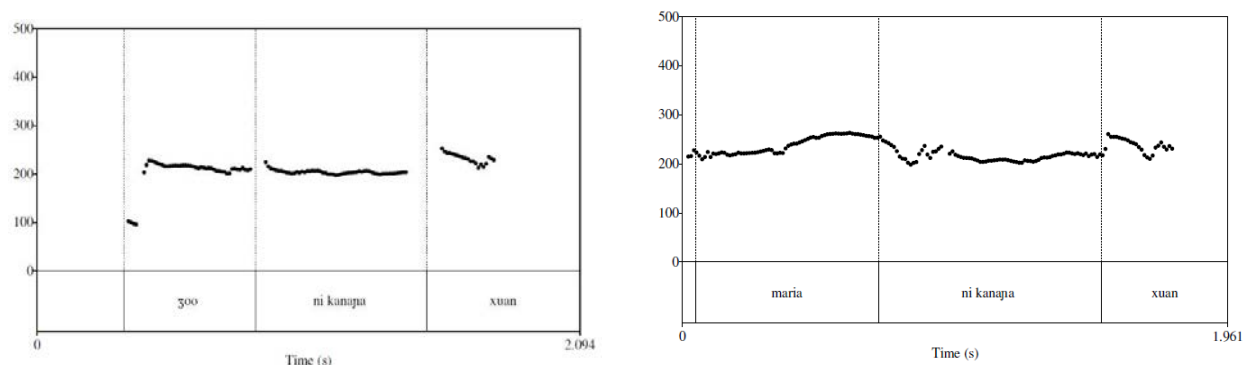


Figure 2. A wh- Q&A pair produced by the female speaker. *zòdò nì kānāñā xúān* ‘Who called Juan?’ (shown on the left) vs. *māría nì kānāñā xúān* ‘Maria called Juan’ (shown on the right).

The question-answer pairs had very similar pitch contours and absolute F0 values for the words they share, based off of careful tonal transcriptions and visual inspection of the pitch tracks. While a quantitative analysis of wh-questions is currently underway, our preliminary qualitative analysis suggests that wh-questions do not involve any specific intonational structure.

Thus, with the current data, only pitch raising exists as an intonational phenomena in polar questions, but crucially the same does not appear to be true for wh-questions. These results are similar to some Ghanaian languages, which are lexical tone languages that use pitch raising (Cahill, 2013) in question prosody. The results for wh-questions are similar to Navajo (McDonough, 2002), in which *no* type of intonational event seems to mark questions.

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