Intonation and related aspects of Santo Domingo Nuxaá Mixtec

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This paper represents a preliminary analysis of some of the strategies used by Santo Domingo Nuxaá Mixtec to convey pragmatic meaning. This paper presents work in progress on intonational and other related prosodic features of Santo Domingo Nuxaá Mixtec, a tonal language of the Otomanguean family spoken in Southern Mexico. First, I show how increased duration is used to indicate narrow focus; secondly, I show another strategy to indicate contrastive focus, that of pause; thirdly, I show that increased overall rate of speech has a pragmatic meaning in that it indicates anger; fourthly, I present an extensive set of sentence level particles which convey pragmatic meanings similar to those which are indicated in non-tonal languages by changes in F_0.

Introduction

Santo Domingo Nuxaá Mixtec has three contrastive tonal levels represented in the lexicon: High, Mid and Low. Tones sponsored by morphemes usually are aligned at the right edge of the morpheme, the first tone in the sequence associating with the final vowel, and in the case of tone patterns with two tones, the second tone associates with the first syllable of the following word. The tone of the initial syllable of utterances is usually phonetically Mid, this tone being supplied by default in the absence of any other available tone. This skewing of association leads to many surface alternations, which are due to the conventions which determine the tonal association, rather than indicating that underlying tones have been changed in some way. As these conventions are very complex, I have chosen to write surface tone on the data in this paper.

Contrastive Focus

Previous authors of analyses of Mixtec phonology, for example Pike [1], have commented on the fact that the penultimate syllable of Mixtec words is longer. However, the data on which these claims were made were impressionistic. In order to verify this claim, I selected a set of disyllabic nouns which gave me 17 pairs of identical syllables in the first and second syllables, so that, for example, the duration of [ti] as the intial syllable was compared with [ti] as the second syllable. Each of these nouns was recorded in medial position in a phrase. I then compared the duration of the first and second syllables of nouns under study. In this data set, the first syllable is on average about 25ms longer than the second syllable, which is statistically significant on a matched-pairs t-test ($t(16) = 2.44$, $p < .05$ (two-tailed)).

From these data it could be assumed that increased duration was a feature at the lexical level. However, further research shows that increased duration is better considered as a feature which operates at the phrase level. An example of phrase level prominence is found in genitival phrases, which in SDN are two nouns juxtaposed; the object possessed is indicated by the first noun and the possessor by the second, for example as shown in 1.

1. Order of nouns in a genitival phrase

Object	Possessor	Gloss
kītī	*lāná*	
animal	child	the child's animal

The initial syllable of the possessed noun is longer that the initial syllable of the possessor. Again syllables were measured, the result being that on average the initial syllable of the first noun is 29ms longer than the first syllable of the second noun, which is statistically significant on a matched-pairs t-test ($t(35) = 3.9$ $p < .05$ (two-tailed)). In these phrases a broad focus interpretation was being used.

The same phrases were then measured with the possessor being in narrow focus, the pragmatic meaning being contrastive, giving phrases which would be conveyed in English by phrases such as 'SUE'S comb was lost.' In these cases there is no correlation between the length of the initial syllable of the possessed noun and the initial syllable of the posssessor.

Further analysis was done, this time to compare the length of the initial syllables of the possessed nouns when in narrow focus with the initial syllables of the same possessed nouns when in broad focus. This research showed that the initial syllables of the possessed nouns when they are in narrow focus are significantly longer than those in broad focus. On average the initial syllable of nouns are 77ms longer when in narrow focus than the same nouns when in broad focus ($t(35) = 11$, $p < .05$ (two-tailed)). The second syllables of the possessed nouns when they are in narrow focus are also longer on average by 58ms. ($t(35)=14$, $p<.05$ (two-tailed)). These results show that increased duration is used to convey pragmatic meaning.

Pause

Another strategy which SDN uses to mark narrow focus is pause. In spontaneous speech, items which are in narrow focus are followed by a significant pause. This pause is absent when there is broad focus. An example of this phenomenon is given in the data in **Error! Reference source not found.** and 3. In example 2, a statement is given in which no item is in narrow focus.

2. **Broad focus**

īkū	nɪ̨kʊ̀ʊ̨	ðāβì
yesterday	came down	rain

'It rained yesterday.'

However, if the same words are said in answer to the question with the word for 'yesterday' being in narrow focus, then there is an audible pause after the word 'iku' yesterday. These data are given in 3.

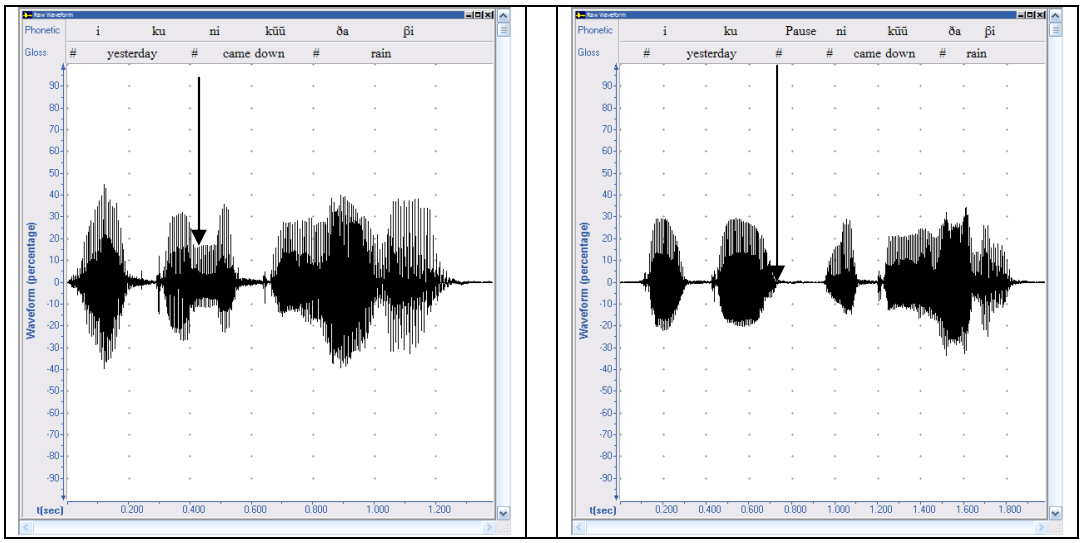
3. **Question and answer**

nɪ̨kʊ̀ʊ̨	ðāβì	kázɪ̨nɪ̨	ā	īkū	nɪ̨kʊ̀ʊ̨	ðāβì
came down	rain	day before yesterday	question	yesterday	came down	rain

"Did it rain the day before yesterday?" "YESTERDAY it rained."

The data in pane A below show the statement intonation, whereas the data in pane B show the narrow focus intonation. The arrows indicate the end of the word *iku* 'yesterday'.

A B



Increased Speed

Increased rate of speech is particularly noticeable in hortatory texts, especially those in which the speaker is scolding someone of lesser social status, for example, a grandparent scolding a grandchild. This paralinguistic feature often indicates anger. To test this auditory perception, ten pairs of sentences were recorded: the first member of the pair was spoken in simulated anger. In each case there was a phrase in common between the pairs. The data for one of these pairs is given in 4.

4. Example of phrases used for comparison

nākʷèná	íʒō	kʷītí	ðāʔβā̧	nǭ
why	very	short	skirt	your

Your skirt is far too short!

nīʃi̯nī	nī	xà	íʒō	kʷītí	ðāʔβā̧	nū̧
saw	I	that	very	short	skirt	her

I saw that her skirt was very short.

The overall lengths of these phrases which were in common were measured, the results showing that decrease in overall duration indicates anger. On average, the phrases said in anger were 19% shorter than those simply stated as a fact.

Particles

One interesting issue in the study of tone languages is to identify the strategies that these languages use to convey the pragmatic meaning that is communicated in non-tone languages by changes in F_0. In many cases SDN uses sentence final particles to indicate these meanings.

Yes/no questions are an example of this phenomenon. In some non-tonal languages, such as English or Spanish, questions are indicated by rising contours. However, as F_0 is lexically

determined, then changes of contour indicate changes in lexical rather than intonational meaning. One example of a contrastive set it given in 5.

5. Contrastive tone contours

ⁿdēē tī	it will go out
ⁿdēē tí	it is going out
ⁿdēè tī	it will go in
ⁿdéē tī	it is going in
ⁿdēé tī	it is grazing

In SDN yes/no questions are indicated by an utterance final particle *-a*. Data are given in 6.

6. Yes/no question particle

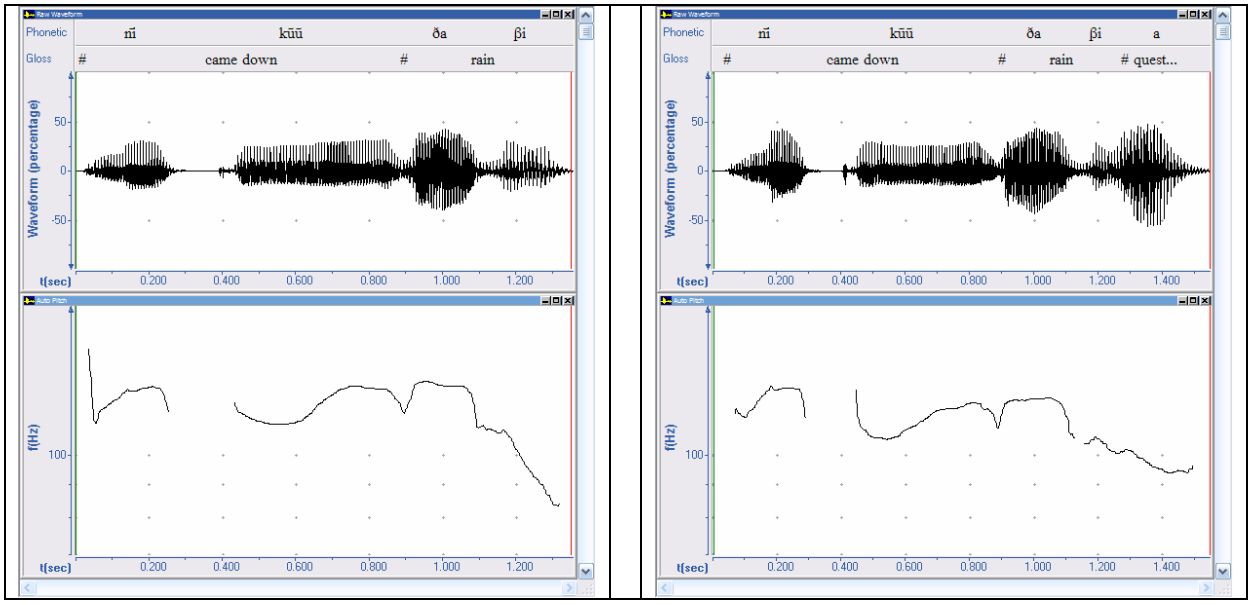
nɪ̰kʊ̰ʊ̰	ðāβì	à
came down	rain	question

Did it rain?

In pane A in example 7, the statement is presented, whereas in pane B the question is presented. Note that there is no change in the overall tone contour, other than the final tone which surfaces on the question particle.

7. Contrast between statement and yes/no question

A **B**



Emotional colouring, such as doubt or surprise, is indicated by utterance final particles. Some of these particles are evidentials, for example, hearsay. However, many of these particles also convey pragmatic meaning, such as surprise, doubt, incredulity, asking for confirmation, rejoinder. For example in 8 the speaker is requesting confirmation as to whether the cat has eaten or not.

8. Sentence final particles

nɪ̄ʃèʃī	βílù	βā
ate	cat	request for confirmation

The particle *βa* 'request for confirmation' is only one of a rather extensive set of such particles. The exact meaning is often difficult to determine. Nevertheless it is of considerable interest that the range of meaning corresponds to pragmatic meanings that are expressed in English by intonational tunes.

Conclusion

This paper has shown some ways in which SDN conveys discourse level pragmatic features by using strategies other than F_0. Further research is required to expand the analysis to cover other features which shed light on the prosodic structure of SDN.

References

[1] Pike, K.L. 1948. Tone Languages. Ann Arbor: University of Michigan Press.