

# Influences on tone in Sepedi, a Southern Bantu language

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## Abstract

Tone in Bantu languages is rarely studied experimentally. This paper reports a production study which reveals the intricate interaction of tonal context and morphological structure in surface tone realization in Sepedi, a South African Bantu language.

**Index Terms:** tone, morphological structure, Bantu language

## 1. Introduction

Bantu languages are register tone languages with two level tones (H, L). Phonologically, only the H is assumed to be specified underlyingly, as it is the active tone that takes part in tone spread and underlies positional restrictions, such as the OCP or finality condition. Phonetically, also L tones appear. The surface tone pattern is characterized by tone sandhi which are crucially determined by morphological structure (Bantu languages are agglutinative) and tonal context. [1]

The present contribution reports an acoustic production study which shows the intricate interaction of tonal context and morphological structure in surface tone realization in Sepedi, a South African Bantu language.

## 2. The study

The realization of two immediately adjacent high tones (underlined) in a variety of morphological contexts of verbal structures was investigated. (SC-subject concord, OC-object conc., T-tense)

Table 1. Target structures

	Underlying structure	Example
1	SC- <u>stem</u>	ó- <u>rum</u> úla...
2	SC-OC- <u>stem</u>	ó- <u>le</u> -námola...
3	SC-T-OC- <u>stem</u>	re-sá- <u>le</u> -námola...
4	SC-T- <u>stem</u>	ó- <u>sa</u> -namola...
5	SC-OC- <u>stem</u>	re- <u>lé</u> -rumúla...

The speech of four Sepedi speakers was recorded, producing 9 utterances (three repetitions of each of three different tokens representing each context) for each of the contexts given in table 1. The pitch contour was time-normalized for a six-syllable window, starting with the first high tone bearing syllable [2].

A representative pitch track by one speaker (averaged over the nine utterances) for the contexts is given in figure 1. The results show that two immediately adjacent high tones are realized in three different ways in Sepedi:

Tone retraction:  $H_1H_2L_3 \rightarrow H_1L_2H_3$

Contexts 1, 2, 3 (solid lines)

Tone deletion (Meeussen's rule):  $H_1H_2 \rightarrow H_1L_2$

Context 4 (dotted line)

Tone displacement:  $H_1H_2 \rightarrow L_1H_2$  [3]

Context 5 (dashed line)

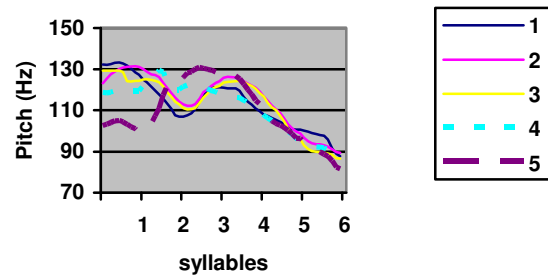


Figure 1: Pitch tracks of all five contexts.

The variation in surface realization can be captured by reference to morphological constituency: Across the boundary of auxiliary stem and macro stem [4], the second H is delinked and re-associated (contexts 1-3). Within the auxiliary stem, the second H is deleted (context 4). Within the macrostem, the first H is displaced (context 5, cf. [3]).

Table 2. Morphological structure

	Morphological structure
1	[SC] <sub>Aux</sub> -[stem] <sub>Macro</sub>
2	[SC] <sub>Aux</sub> -[OC-stem] <sub>Macro</sub>
3	[SC-T] <sub>Aux</sub> -[OC-stem] <sub>Macro</sub>
4	[SC-T] <sub>Aux</sub> -[stem] <sub>Macro</sub>
5	[SC] <sub>Aux</sub> -[OC-stem] <sub>Macro</sub>

## 3. Conclusion

The study shows that morphology crucially determines surface realizations of tones in Sepedi. The same linear tone sequence (HH) is realized in three different ways depending on the morphological structure of the utterance. Along with our earlier study on the realization of a single high tone in Sepedi [3], these observations enable us to predict the surface realization of tone in verbal constructs systematically.

## 4. References

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