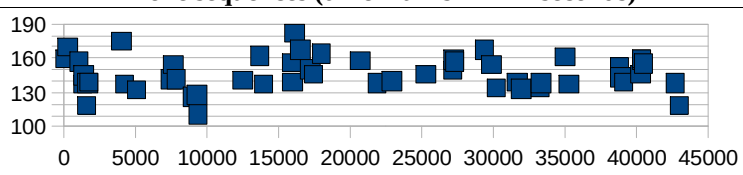
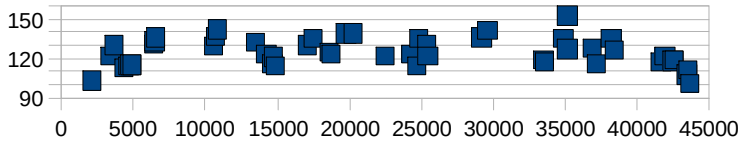
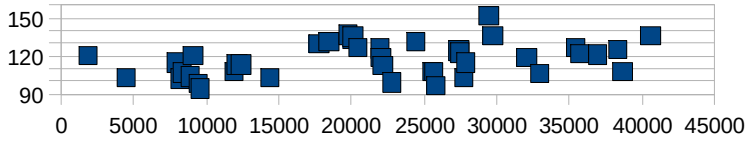
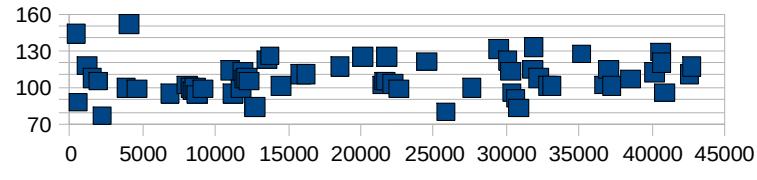
Analysis and synthesis of lexical tone in discourse: Bete narrative prosody

Dafydd Gibbon

University of Bielefeld - Germany

In the present study the distribution of lexical tone in Bete narrative (Ivory Coast, Kru, ISO 639-3 bev) is investigated. Quantitative studies of lexical tone typically address sequences up to sentence level, with little attention to longer suprasentential sequences. Discourse narrator-responder-audience contexts is more interesting, but quantitative study requires very large corpora, and West African languages are notoriously resource-scarce. As a starting point, a formal baseline with a restricted set of descriptive variables is therefore advantageous, and can be incremented later.

Bete is a four-tone language (Kipre, 1989), and a good candidate for 'discrete level' (i.e. non-terracing) tone. The short sample illustrated here was read by a male native speaker, age 40-50, phonemically annotated, and analysed with a custom phonetic package. Pitch sequences for each lexical tone are shown separately in the following figures, with descriptive statistics and linear regression analysis (offset and slope) results.

		Frequency (Hz)						
Tone	**N**	**min**	**max**	**mean**	**sd**	**offset**	**slope**	**Tone sequences (time marks in milliseconds)**
HH:	51	111	182	146	14	146	1.5e-05	
H:	49	101	152	125	11	127	-5e-05	
M:	41	94	152	117	13	107	0.0005	
L:	62	77	152	107	14	105	0.0001	

The results are partly unexpected. First, HH sequences rise minimally (long term 'upsweep', Ahoua 1988); H tones fall minimally; M and L sequences are level (no long-term downdrift; cf. Connell 2001). Second, very small slopes and low standard deviation interval overlap support the 'discrete level' hypothesis. To check documentation quality, the annotated data are re-synthesised using a diphone speech synthesiser and subjected to perceptual testing to validate the quality of the annotation in comparison with the original (following Gibbon & Bachan 2008). In the full paper, further results, complete figures, and further references are given.