

# Intonation and emotions in Konni

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## Introduction

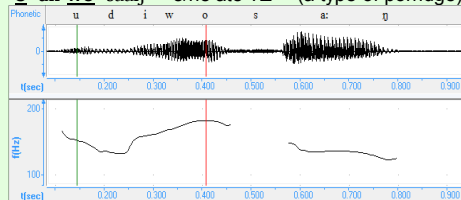
Intonation in tone languages has not been studied nearly as much as in non-tonal languages, perhaps assuming that tone would negate any intonation pitch differences.

However, *paralinguistic* functions of intonation are more amenable to study. One of these is the use of gradient changes of pitch and duration to indicate emotional states (Gussenhoven 2004, Ladd, Sherer, and Silverman 1986).

## Methodology

- Thanks to Mr. Konlan Kpeebe, Ghana Institute of Linguistics, Literacy, and Bible Translation (GILLBT), for recording Mr. Naaza Solomon Dintigi and Mr. Mumuni Salifu Barnabas, native speakers of Konni ([kom], Gur) . I supplied the questions.
- They first said a sentence normally, then repeated as if surprised, bored, angry, "contemptuous," and emphatic. Salifu did the most.
- Each sentence repeated 3 times. The "surprise" response often resulted in a polar question, e.g. "S/he went to market?"
- Displays and measurements used SIL's Speech Analyzer program.

### (1) ù dìiwó 'sáán 's/he ate TZ' (a type of porridge)



- The key measurements:
  - Low on the first vowel. This L indicates the general pitch of the sentence: its *level*.
  - High on the first High of the sentence. The H-L difference indicates how much the sentence varies in pitch: its *range*.
  - Duration* was also measured.
  - The sentences:
    - s/he has cooked yams ù dìiwó nyúà
    - s/he has gone to market ù gàwá 'nyúŋ
    - s/he has bought oil ù dààwá kpáán
    - s/he has cooked eggs ù dìiwó gílà
    - s/he has fried eggs ù chòŋwá gílà
    - s/he has eaten TZ ù dìiwó 'sáán
    - s/he has fetched fire ù chòŋsiwó 'bólín

## Sample Results

(Complete results on handout)  
EXP = expanded range, CONT = contracted range

### (2) She has cooked yams: ù dìiwó nyúà Solomon

	L (Hz)	H (Hz)	range (H-L)	duration (msec)	compared to neutral
neutral	128	153	25	798	-----
bored	128	157	29	810	l-exp, l-slower
angry	152	182	30	697	higher, l-exp, faster
contemptuous	147	177	30	738	higher, l-exp, faster
emphatic	135	172	37	743	l-higher, EXP, faster
surprise -no Q	156	185	29	703	higher, faster

### (3) She has cooked yams: ù dìiwó nyúà Salifu

	L (Hz)	H (Hz)	range (H-L)	Duration (msec)	compared to neutral
neutral	134	155	21	680	-----
bored	140	164	24	629	l-higher, l-exp, faster
angry	142	172	32	682	higher, EXP
contemptuous	139	167	28	679	l-higher, exp
emphatic	142	180	38	706	higher, EXP, slower
surprise - Q	146	186	40	774	higher, EXP, longer

The two speakers had some variation.

### (4) He has bought oil: ù dààwá kpáán Salifu

	L (Hz)	H (Hz)	range (H-L)	Duration (msec)	compared to neutral
neutral	134	144	10	700	-----
surprise Q	152	185	33	806	higher, EXP, longer
bored	140	155	15	629	l-higher, exp, faster
angry	140	172	32	682	l-higher, EXP, faster
contemptuous	134	149	15	692	l-exp, l-faster
emphatic	145	172	27	717	higher, EXP, slower

### (5) He has fetched fire ù chòŋsiwó 'bólín Salifu

	L (Hz)	H (Hz)	range (H-L)	Duration (msec)	compared to neutral
neutral	139	191	52	801	-----
surprise Q	148	196	48	909	higher, EXP, longer
bored	131	157	26	804	lower, CONT
angry	136	200	64	760	l-EXP, faster
contemptuous	132	169	37	779	l-lower, CONT, faster
emphatic	142	199	57	802	l-higher, l-EXP

## (5) Summary of results

S/he has...	bored	angry	contemptuous	emphatic	surprise
cooked yams	l-slower	higher, l-exp, faster	higher, l-exp, faster	l-higher, EXP, faster	higher, faster -not Question
Solomon					
Salifu	l-higher, l-exp, faster	higher, EXP	l-higher, exp	higher, EXP, slower	higher, EXP, longer
gone to market	lower, l-CONT, faster	EXP, faster	lower, l-CONT, faster	higher, EXP, slower	higher, EXP, longer
bought oil	l-higher, exp, faster	l-higher, EXP, faster	l-exp, l-faster	higher, EXP, slower	higher, EXP, longer
cooked eggs	l-CONT, faster	l-higher, EXP, slower	l-higher, l-CONT, l-slower	higher, EXP, l-slower	higher, EXP, longer
fried eggs	CONT, faster	EXP	CONT, l-faster	higher, EXP, slower	higher, EXP, longer
eaten TZ	CONT, faster	no data	CONT, slower	l-higher, EXP, slower	higher, EXP, longer
fetched fire	lower, CONT	l-EXP, faster	l-lower, CONT, faster	l-higher, l-EXP	higher, EXP, longer

## Discussion

### (6) Properties of emotions in Konni

	base pitch	range	speech rate	volume
bored	neutral	contracted	faster	quieter
contemptuous	neutral	contracted	varied/faster	quieter
angry	little higher	expanded	faster	same
emphatic	higher	expanded	slower	louder
surprise	higher	expanded	longer	

- People can recognize *some* emotions cross-linguistically (Gussenhoven 2004:72). Taiwanese and Japanese speakers identified sadness, anger, and surprise by Dutch speakers at above chance levels. However, contempt and shame were not recognized.
- Obvious next step: test whether Konni (or other) speakers can identify emotions from these recordings.