

# A Web Tool for Testing the Recognition of Emotional States and Tones in Speech

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## Abstract

We report on a web tool for assessing the accuracy of tonality and emotion communication through voice, for short sentences, in the Romanian language. The tool allows us a statistical characterization of the interpretation degree of common listeners of the emotional state and tone that characterize the records utterances. The intended emotional contents of the sentences fall into one of the categories: **neutral** (relaxed), **joy**, **anger**, and **sadness**. The speakers are "common people" (no actors).

Confusion matrix for emotional states validation		Perceived classes					Total votes	% error
		Neutral tone	Joy	Anger	Sadness	Ambiguous		
Expressed classes	Neutral tone	124	10	8	77	12	231	46.32
	Joy	43	128	35	23	8	237	45.99
	Anger	50	37	121	25	4	237	48.95
	Sadness	53	19	9	151	11	243	37.86

The spoken sentences are: *Aseară* - Yesterday evening, *Vine mama* - Mother is coming, *Cine a făcut asta* - Who made this/The one who made this..., *Ai venit iar la mine* - You came back to me again.

Aseară		Perceived classes					Total votes	% error
		Neutral tone	Joy	Anger	Sadness	Ambiguous		
Expressed classes	Neutral tone	33	3	0	22	4	62	46.77
	Joy	14	33	4	3	3	57	42.11
	Anger	17	4	29	1	3	54	46.30
	Sadness	11	1	0	40	2	54	25.93

Ai venit iar la mine		Perceived classes					Total votes	% error
		Neutral tone	Joy	Anger	Sadness	Ambiguous		
Expressed classes	Neutral tone	29	2	1	26	1	59	50.85
	Joy	9	29	3	14	3	58	50.00
	Anger	9	8	33	14	0	64	48.44
	Sadness	10	4	2	48	0	64	25.00

## Introduction

The research aim is to determine:

- to what degree are recognizable, for "common Romanian speakers" and "common listeners", the emotional states and tonalities;
- to what degree we have the possibility of understanding the prosody in messages which have been uttered by an unknown person.

## Method

The experimental studies were made by 13 normal listeners (researchers from ICS), grouped in:

- six persons who have not worked on the creation of the recordings database but have not worked in the area of speech signal processing;
- three experts in speech processing but not having contributed to our database (who previously worked for the speech database);
- four experts who worked on the creation of the recordings database.

## Results – Samples

The emotional states and the tonalities are communicated and/or conveyed with variable degrees of success; the accuracy was between 51% - 62% for emotional states and 77% - 87% for tones.

Vine mama		Perceived classes					Total votes	% error
		Neutral tone	Joy	Anger	Sadness	Ambiguous		
Expressed classes	Neutral tone	40	4	0	4	6	54	25.93
	Joy	8	36	3	1	2	50	28.00
	Anger	13	20	22	3	1	59	62.71
	Sadness	24	11	0	35	3	73	52.05

Cine a făcut asta		Perceived classes					Total votes	% error
		Neutral tone	Joy	Anger	Sadness	Ambiguous		
Expressed classes	Neutral tone	22	1	7	25	1	56	60.71
	Joy	12	30	25	5	0	72	58.33
	Anger	11	5	37	7	0	60	38.33
	Sadness	8	3	7	28	6	52	46.15

## Conclusions

Sentences not conveying enough context for deriving the meaning make difficult the emotional interpretation.

High recognition scores are obtained only for *sadness* and for all tones.