The discrimination accuracy of angry and happy emotions in the voice

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Introduction

- Voice is an essential part of communication that provides nonverbal information about the speaker's emotional, health, social status, attitude, age, and gender;

- Communication quality depends on how the speaker's message is perceived. Words, sentences, semantics, as well as the contextual background expressed by paralinguistic communication means should be clearly read;

- The perception of the voice is the final output of the voice production

Introduction

Emotional valence describes the extent to which an emotion is positive or negative, whereas arousal refers to its intensity, i.e., the strength of the associated emotional state (Citron et al., 2014)

Mneimne et al., 2010
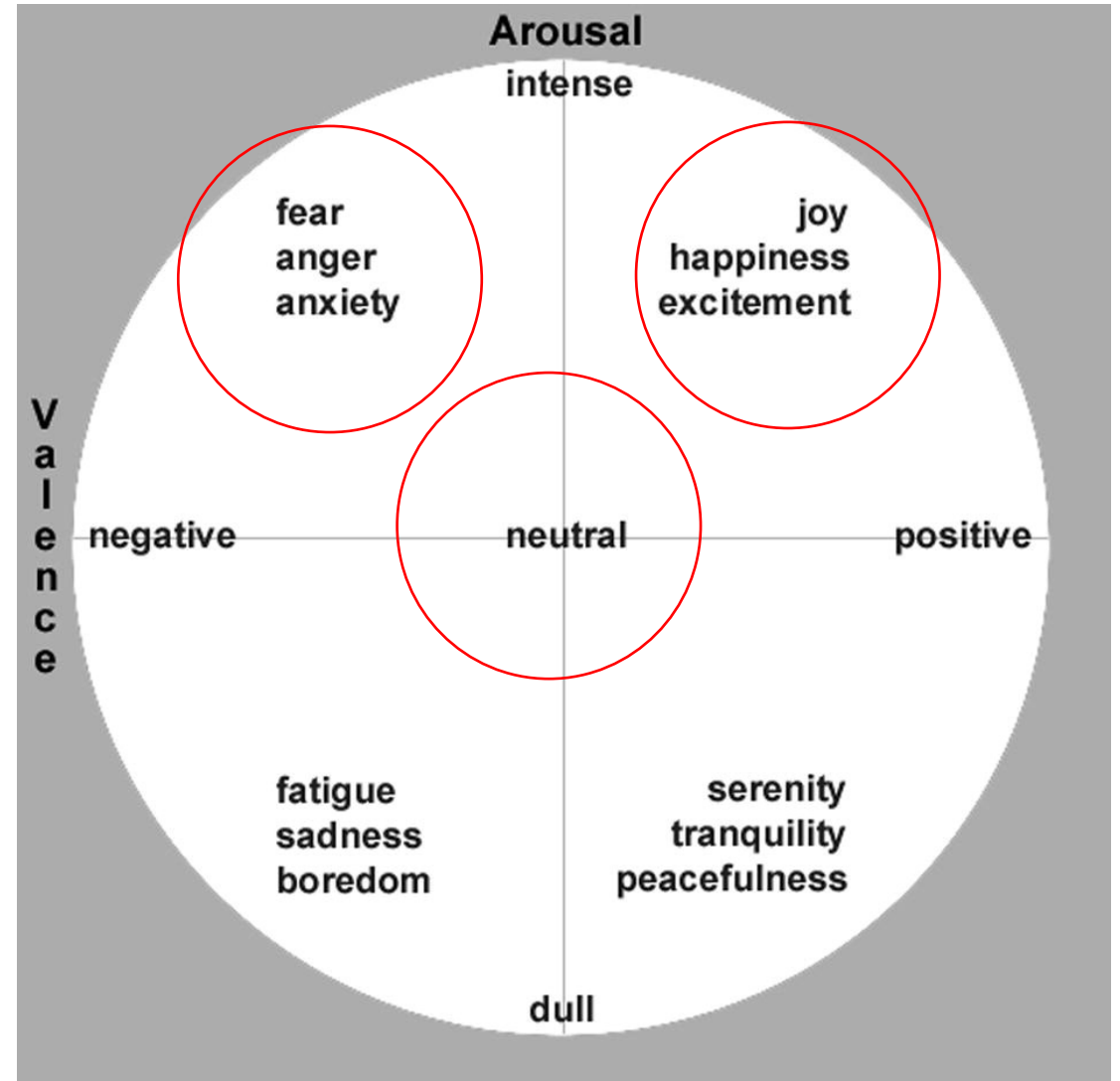
The aim of the study

To investigate whether the discrimination accuracy of emotions in voice and determining the arousal level of affective emotions were associated with the age and gender of the listener and the type of perceived linguistic unit.

Methods

Recordings

- Professional actors (N = 10)
- Words (4), phrases (4), text (1)
- Neutral, happy, angry intonations
- Each voice sample – 3 times
- Voice samples (N = 810)
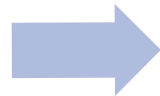
Selection of voice samples

- Expert panel (N = 6)
- Females
- Age M = 44.3, SD = 13.7, 21-57
- Selection criteria
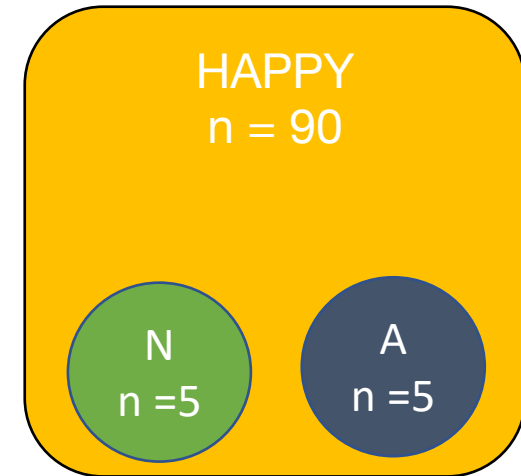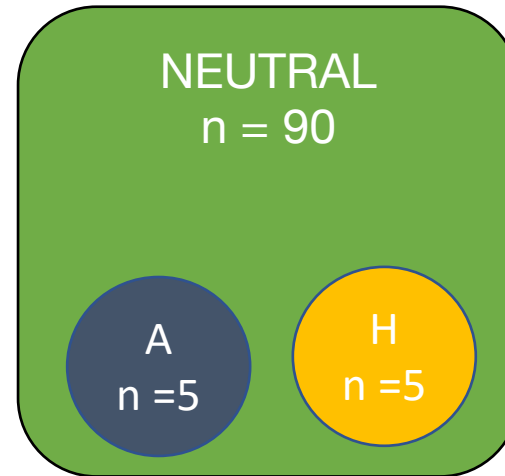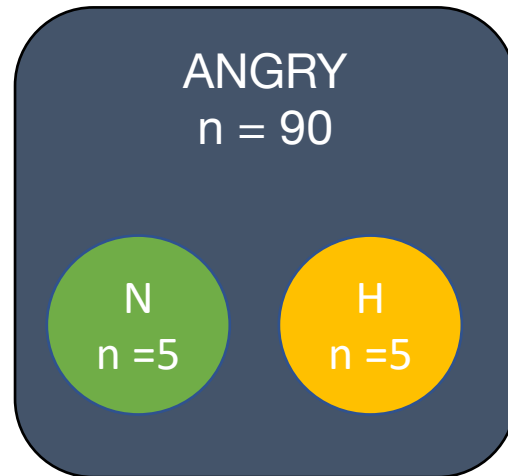- Voice samples (N = 270 (90/90/90))

Listening experiment

- Participants N = 32 (16 F, 16 M)
- Age-matched
- Age range 18-59 years
- No hearing disorders
- Native language: Latvian

Methods

ANGRY
n = 90

N
n = 5

H
n = 5

NEUTRAL
n = 90

A
n = 5

H
n = 5

HAPPY
n = 90

N
n = 5

A
n = 5

1. Chose one of three emotions after listening to voice stimulus

2. Assess the level of intensity of emotion (VAS 100 mm)

Results (I). Discrimination accuracy of emotional valence in voice samples (%)
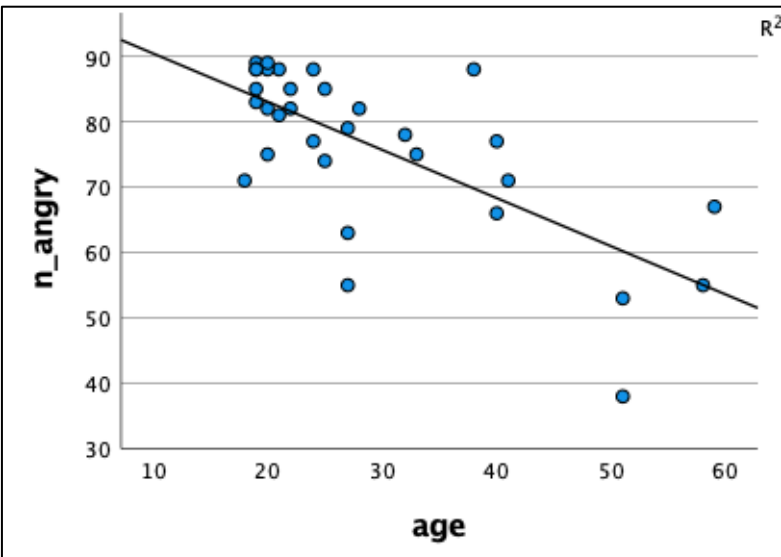
	Angry	Neutral	Happy
Angry	84.9	13.8	1.3
Neutral	18.9	73.2	7.9
Happy	7.0	25.6	67.4

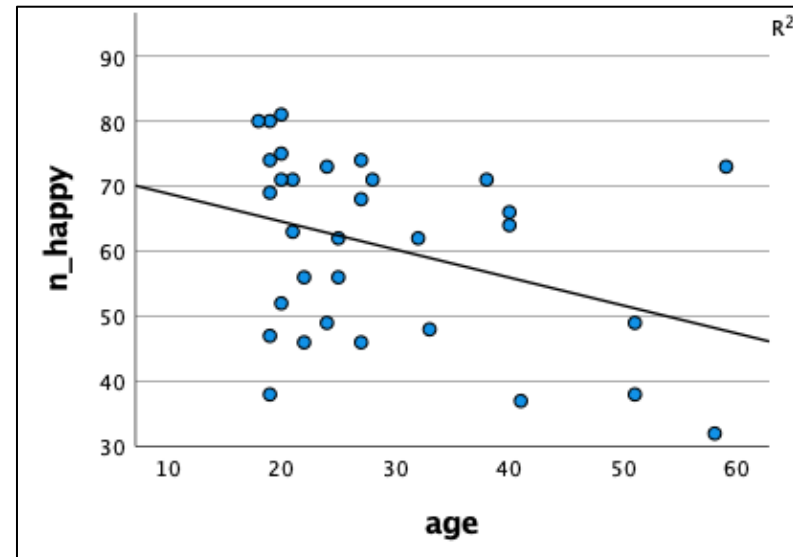# Results (II) Discrimination accuracy of emotions in voice and age
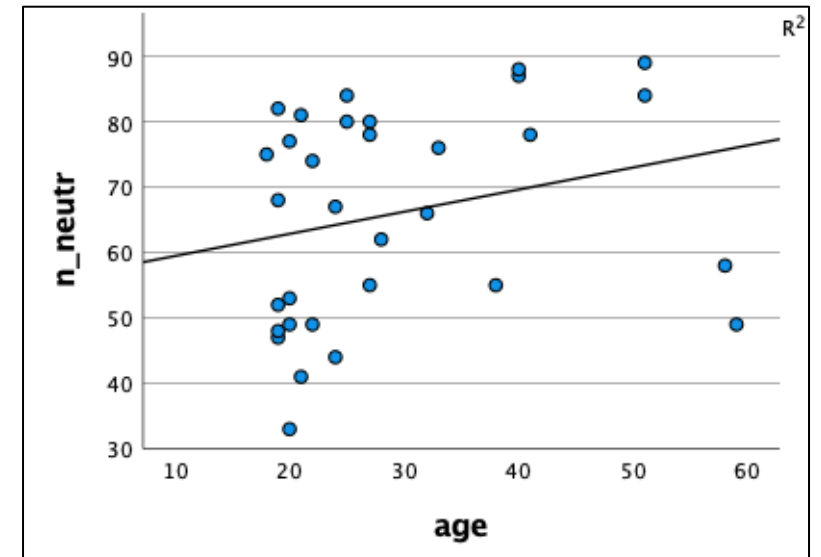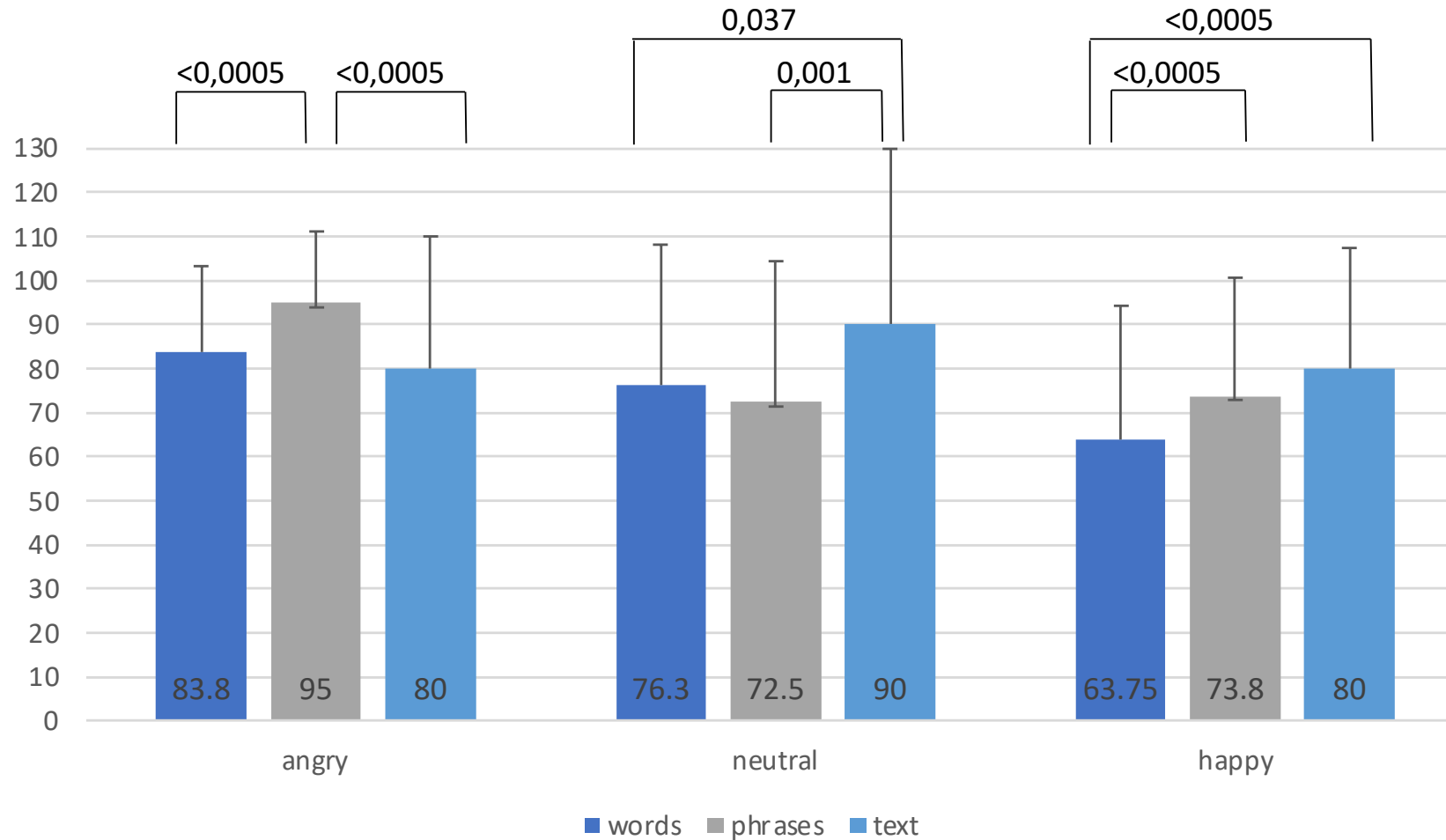

Angry

Happy

Neutral

$r_S = -.642, p < .001$

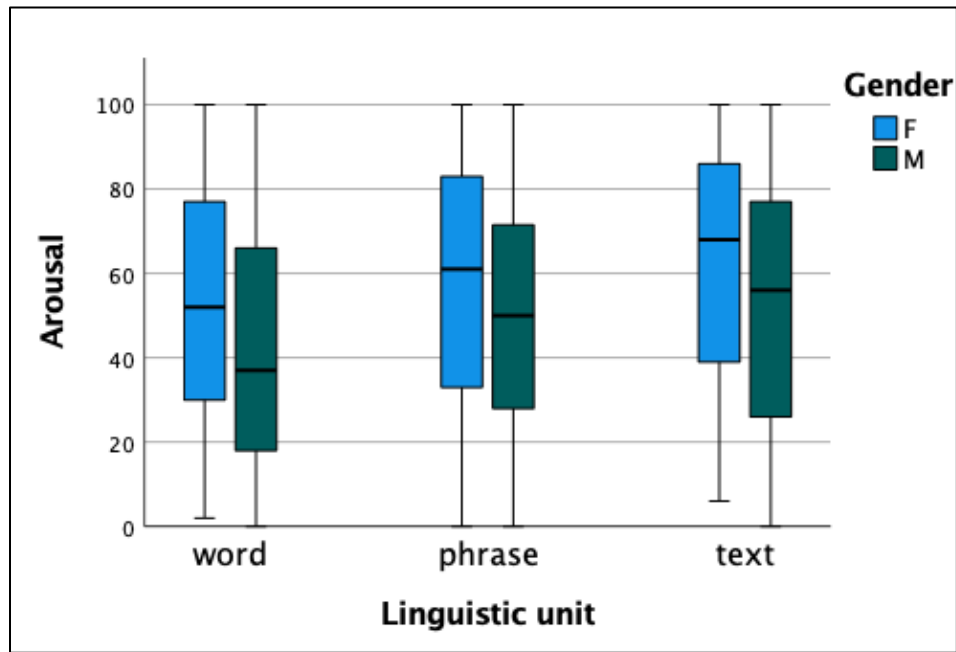$r_S = -.364, p = .041$

$r_S = .374, p = .035$

Results (III). Discrimination accuracy of emotions in voice and type of linguistic unit

Results (IV). Determination of the level of expression of affective emotions in voice
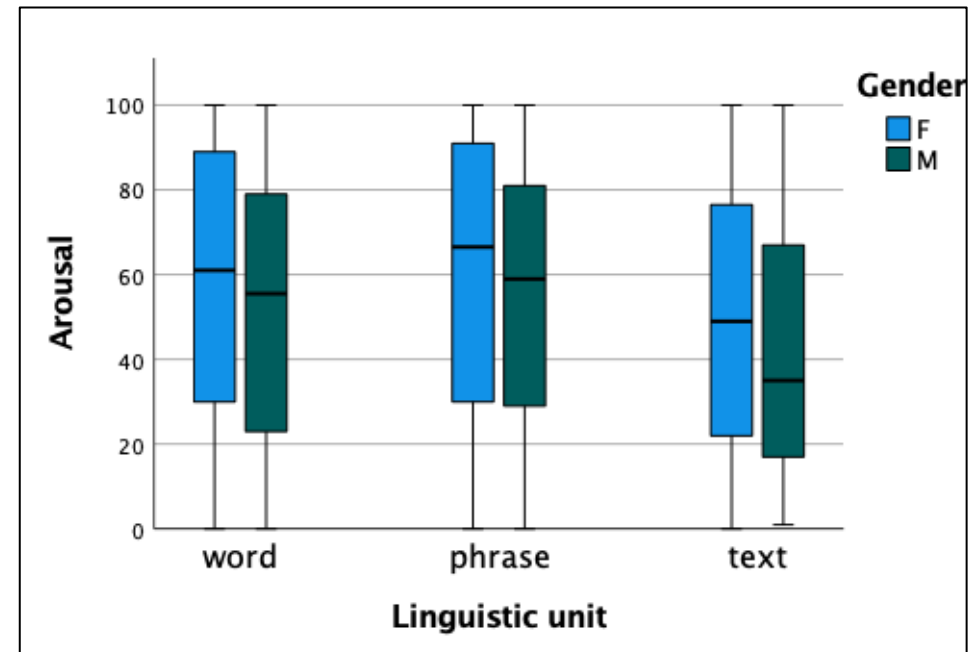
Happy

words (z = -5.799, p < .001),
phrases (z = -4.706, p < .001),
text samples (z = -2.699, p = .007)

Angry

words (z = -3.599, p < .001),
phrases (z = -3.218, p = .001),
text samples (z = -2.272, p = .023)

Conclusions

- Respondents were most accurate in recognizing angry emotions

- Young adults perceive and recognize affective emotions better than older persons, while at the same time, perception and interpreting of neutral emotions were more difficult for them.

- Females tend to perceive greater arousal in both angry and happy emotions expressed in voices than males.

- The length of speech units affects the more precise transmission of the emotional component in voice.

Further studies

Affective and disordered vocal stimuli neural processing during mobile task: an EEG study

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Thank you for the attention!

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