

# Perception of Vocal Expression of Emotions in Kannada Speaking Healthy Adults

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## ABSTRACT

Vocal expression is the most common approach to understand emotions in speech. There are various types of emotional expression that every human experience, but happiness, sad, fear, questioning was found to be most experienced by humans in day-to-day conversation. Perception of these emotions is much necessary to understand the feelings and interpret the speaker's emotional status and intend of communication. Various researchers have reported aging led to a deterioration on emotional perception, and some researchers have also reported emotion is relatively unaffected by aging or even improves with age contradictorily. In spoken language, intonation caters diverse linguistic and paralinguistic functions. It is important to identify how healthy adults interpret emotions expressed in their native language. Hence, the present study was carried out to investigate the perception of emotion in sentences by Kannada speaking healthy adults aged between 30 to 60 years. Participants were divided into three groups based on a decade interval consisting of 15 males and 15 females in each group respectively. Five different emotions were considered and instructed the participant to identify the emotions heard presented aurally and report it on a response sheet. The analysis of those perceived emotions showed no age and gender effects in decoding emotions from speech act.

**Keywords:** Perceiving emotions, Emotion Perception, Emotion expression, Vocal emotion, Sentence emotion

## INTRODUCTION

Social interaction depends on accurate emotion recognition<sup>1</sup>. Aging impacts on the perception of acoustic cues in which older adults showed least sensitive to pitch differences than younger adults<sup>2</sup>. According to socio emotional selectivity theory; age increases the motivation to derive emotional meaning from life. Thus, older adults may show a higher detection of emotional information in their environment than do younger ones<sup>3</sup>. Sociocognitive perspectives predict an improvement in understanding emotions as age increases, whereas neuropsychological perspectives suggest decline in understanding emotions as age

increases<sup>4</sup>. Recent researchers shows that emotion is relatively unaffected by age and or improves with age, in comparison to most cognitive functions<sup>5</sup>. According to Dynamic integration theory, the diminishing cognitive capacities are associated with age and shows difficulty in integrating and accepting negative feelings, and therefore, older adults increasingly favor affect optimization over affect complexity<sup>6</sup>. A study by group of researchers was carried out incorporating 30 young adults (aged 20–40 years) and 30 older adults (aged 60–80 years) on a range of emotional ability measures (Stories, Blends, Empathy, Faces, Eyes and Vocabulary). The results of the study

indicated that, there were no age effects on the ability to perceive emotions from verbal material. Older people were less able to identify facial expressions of anger and sadness and showed poorer ability to identify theory of mind from pictures of eyes. The results indicate specific age-related deficits in identifying some aspects of emotion from faces, but no age effects on the understanding of emotions in verbal descriptions<sup>7</sup>.

The production of affective prosody, measured by variation of F<sub>0</sub> on various stimuli, does not change significantly through ageing but that comprehension of affective prosody showed that, older participants had decline in grasping prosodic affects<sup>8</sup>. Older adults were more efficient than younger adults in inhibiting angry facial expressions by comparing with happy and neutral faces in the visual search arrays<sup>9</sup>. In a study younger adult and older adults detected threatening faces more quickly than other types of emotional stimuli<sup>11,12</sup>. Perception of the emotion dimensions arousal (calm vs. aroused) and valence (positive vs. negative attitude) in conversational speech in German Speaking individuals was carried out. Participants were 19-24 years old 20 native Germans and 61-82 years old 17 Germans. The results found that the age differences in the interpretation of mean F<sub>0</sub> as a cue for valence are likely due to age-related hearing loss. The age differences in rating arousal do not seem to be driven by hearing sensitivity differences between age groups as measured by pure tone audiometry<sup>13</sup>.

#### Need for the study

Several scientific studies showed aging led to deterioration on emotional perception, and also literature indicating emotion is relatively unaffected by aging or even improves with age. In spoken language, intonation serves diverse linguistic and paralinguistic functions. It is important to identify how healthy adults interpret emotions expressed in their native language, thus reducing the danger of communication breakdown. Hence, in the current study, we

address the following research question: Does age and gender act as factor for better or poor understanding of different types of emotions expressed in their native language.

#### Aim of the study:

To investigate the perception of emotion in sentence by Kannada speaking healthy adults aged 30 to 60 years.

#### Objectives of the study

1. To study perception of emotion in sentence across 30-60 years of age (30-40; 40-50; and 50-60 years) in Kannada speaking healthy adults.
2. To identify gender difference if any.

## MATERIALS & METHODS

### Participants

A total of 90 healthy adults in the age range of 30-60 years participated in this study. All participants were native Kannada speakers from Mysuru city, Karnataka state. They were divided cross-sectionally into three subgroups with ten year of age interval. Each age group consists of 30 participants (15 male and 15 female). Individuals with normal hearing, Speech, Language and Cognition were included in the study by asking questions related to those abilities and Individuals with the complaint of ear discharge, hearing loss, Speech, Language and Cognitive impairments secondary to stroke, accident and or any other causes were excluded from the study.

### Stimulus

Five-to-six-word sentences depicting five emotions- Happiness, Sadness, Anger, Question and Statement, formed the stimuli. Each sentence chosen for the study was spoken by a female native Kannada speaker with normal voice quality. The recording was done using a calibrated dynamic unidirectional microphone which was kept at a distance of 10 cm from the mouth onto the PRAAT software (Version 5.3.23) in a sound-treated audiometry room met with the ANSI specifications.

The audio samples were given for perceptual rating to five experienced Speech- Language Pathologists with Kannada as their mother tongue. Participants were instructed to listen to the audio samples and classify the sentences heard into the five chosen emotions. Only those sentences which were classified as depicting the intended emotions were considered as final stimulus. Totally ten sentences (two sentence for each emotion) were considered as final stimulus.

**Procedure**

All participants were informed about the study by a written document and signed a consent letter prior to the study. Each participant was tested individually in a noise free environment. Participants were seated comfortably in front of a computer screen

wearing headphone. The selected audio sample of ten sentences and four sentences as distracters were presented in random order over the headphone. Participants were instructed to listen to the sentence and identify the type of emotion (i.e. Happiness, Sadness, Anger, Question and Statement) and to document it in the response sheet given to them.

**Response Scoring:**

The correctly identified emotion were given a score of ONE and incorrect response as ZERO in this task.

**RESULTS AND DISCUSSION**

The study aimed at understanding the emotion perception in Kannada speaking healthy adults and the results of this study are presented as follows:

**Table 1: Mean and SD in perception of emotions for male**

Emotions	AGE (years)					
	30-40		40-50		50-60	
	Mean	SD	Mean	SD	Mean	SD
Happy	2.00	.000	2.00	.000	2.00	.000
Sad	1.87	.352	1.87	.352	1.80	.414
Anger	1.80	.414	1.87	.352	1.80	.414
Question	2.00	.000	2.00	.000	2.00	.000
Statement	1.80	.414	1.93	.258	1.73	.458

**Table 2: Mean and SD in perception of emotions for female**

Emotions	AGE (years)					
	30-40		40-50		50-60	
	Mean	SD	Mean	SD	Mean	SD
Happy	2.00	.000	2.00	.000	2.00	.000
Sad	1.87	.352	1.80	.414	1.80	.414
Anger	1.87	.352	1.80	.414	1.73	.458
Question	2.00	.000	2.00	.000	2.00	.000
Statement	1.87	.352	1.87	.352	1.80	.414

**Table 3: Gender differences in perception of emotions**

Emotions	30-40		40-50		50-60	
	Z	Sig (0.05)	Z	Sig (0.05)	Z	Sig (0.05)
Happy	.00	NS	.00	NS	.00	NS
Sad	.00	NS	-.48	NS	.00	NS
Anger	-.48	NS	-.48	NS	-.42	NS
Question	.00	NS	.00	NS	.00	NS
Statement	-.48	NS	-.59	NS	-.42	NS

NS: Not significant

Table: 1 and Table: 2 show the descriptive statistical result, mean and standard deviation scores for perception of emotion by male and female group. The results of the present study indicate that, for emotions of happy and questions the mean scores

were slightly higher compared to emotions of sad, anger and statement for all the three groups studied. In order to check for the presence of gender effect on perception of emotions, Mann-Whitney U test was carried out (Table 3). The results showed that, there

were no statistically significant differences at 0.05 level of significance between genders in all the three groups. As there were no differences seen between the

genders, the data of male and female were combined for further analysis using ANOVA test. The results of the test reported in table 4.

**Table 4: Gender differences in perception of emotions**

Emotions	30-40	40-50	50-60
Happy	{F [(1, 58)=.87]}	{F [(1, 58)=.86]}	{F [(1, 58)=.87]}
Sad	{F [(1, 58)=.72]}	{F [(1, 58)=.74]}	{F [(1, 58)=.49]}
Anger	{F [(1, 58)=1.00]}	F [(1, 58)=.52]}	{F [(1, 58)=.52]}
Question	{F [(1, 58)=.87]}	{F [(1, 58)=.86]}	{F [(1, 58)=.87]}
Statement	{F [(1, 58)=.45]}	{F [(1, 58)=.52]}	{F [(1, 58)=.17]}

ANOVA test results at 0.05 level of significance for group comparison on perception of emotions also revealed no significant differences across the groups. Socio emotional selectivity Theory is considered to be the dominant theory in the field of emotional and social aging. According to the theory individual grow older their motivational orientation begins to change. Their life goals will be more person-focused (such as seeking emotion and meaning) rather than future oriented (such as gaining new knowledge or establishing new social contacts). The results of this study are in support with earlier Sociocognitive studies and psychological research perspectives indicating emotion is relatively unaffected by aging<sup>14, 15</sup>.

Aging is naturally associated with endings; therefore, the theory predicts motivational changes with age. As age increases, individuals develop better ability to understand, anticipate, and react to the emotional responses of other people, because of added interpersonal experience across the life span<sup>16</sup>.The results also support the view by Phillips, showing that there were no age effects on the ability to decode emotions from verbal material<sup>17</sup>.

## CONCLUSION

The results of the current study showed that there is no significant effect of age and gender across the age groups and emotions in kannada speaking healthy adults. The present work is also in consonance with earlier studies suggesting that emotions perception is relatively unaffected by aging

but addressing this issue becomes very important when it comes to the question of rehabilitation of disordered population especially in neuro rehabilitation.

## LIMITATIONS

The results of this study are speaker-dependent and it concentrated at sentence level interpretation of only few emotional types. It would be of considerable interest to know at conversational level evaluating perception of emotions.

## Declaration by Authors

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**Conflict of Interest:** The authors declare no conflict of interest.

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