Abstract

Background: Voice, apart from its semantic content also carries information about the speaker’s psychological and physical state. Emotional stress or physical fatigue, are the pathological elements of this condition. The possible relationship between emotional stress and the measurable changes to the voice signal was the subject of this study. Method: Eleven subjects were interviewed with questions from two domains and their responses were recorded. In the first domain, two men, two women and three teenagers were asked to remember an incident from their past where they felt embarrassed or ashamed of their own act. In the second domain, three women and one man from the housekeeping staff were interviewed for the stolen mobile phone. These subjects were different from the subjects who participated in domain 1. Stress in voice was detected as a measure of shift in the acoustic parameters with respect to
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the baseline. All recordings were analyzed using PRAAT software. Spectrograms were also plotted for qualitative comparison between normal speech and stressed speech. Result: Significant increase in mean pitch and substantial decrease in the first two formants (F1 and F2) were observed under stress. Other acoustic measures did undergo change under stress but failed to reveal any significance. Spectrograms were distinct for the two conditions.

Conclusion: Obtained results indicate that, when a person is emotionally charged, stress could be discerned in his voice. Mean pitch and Formants F1 and F2 have been obtained as reliable vocal indicators of emotional stress. This study proposes a simple non-invasive approach which can act as an alibi for innocent people.

References

Vocal Indicators of Emotional Stress


**Index Terms**

Computer Science

Speech Processing

**Keywords**

Deception anxiety stress spectrogram mean pitch formants