

Long, G. T., & Krall, V. L. (1990). The measurement of stress by voice analysis. Journal of social behavior and personality, 5(6), 723-731.

Long and Krall (1990) tested the Mark II Voice Stress Analyzer as an indicator of stress caused by the exposure to an aversive stimulus. Like the Psychological Stress Evaluator (PSE), the Mark II is devised to capture changes in voice (i.e., “wavering”) that may be related to stress. Unlike the PSE that is criticized for its subjective data interpretation process, the Mark II provides a numerical output and does not leave much room for a subjective interpretation of data. Although there have not been many studies, the Mark II was found to identify voice changes that were related to stress in a planned lie and anxiety.

In the present study, the Mark II was used to identify voice changes due to stress of being exposed to an aversive stimulus, a tarantula. A total of 38 participants (20 males and 18 females) were asked to say 3 words (“sleep,” “lake” and “glass”) first in the non-stressful condition, and then in the stressful condition. First, in the non-stressful condition, a participant simply said and made voice-recording of the 3 words, and gave a self-reported stress level, ranging from 0 (no stress) to 5 (very high stress). Then, a tarantula in a box was introduced, and the participant was told that he or she would have to touch the tarantula after making voice-recording, although in reality, the participant did not have to touch the tarantula. Having the tarantula in sight, the participant said and made voice-recording of the 3 words, and gave a self-reported stress level. The Mark II produced a numerical output (i.e., a stress score) for each voice-recording, that could range from 0 to 999, where higher scores reflected higher stress levels.

Stress scores were analyzed as a function of stress condition, gender and words. Overall, higher stress scores were found in the stressful condition than in the non-stressful condition, indicating that the Mark II captured voice changes related to stress. Also, higher levels of self-reported stress were found in the stressful condition than in the non-stressful condition. So, the finding by the Mark II was consistent with the finding in self-reported stress. Higher stress scores were found in females than in males, and more importantly, females showed a larger magnitude of voice changes due to stress than males. Moreover, the data analysis showed that the largest magnitude of voice changes was found on the first word (i.e., “sleep”), and the smallest magnitude of voice changes was found on the last word (“glass”). In other words, the word order influenced the magnitude of voice changes due to stress.

The present study provided evidence that the Mark II could identify stress-related changes in voice. However, there are some precautions that should be taken into consideration. First, the volume of voice influences the Mark II scoring: an increase in the volume leads to an increase in scoring. Characteristics of words also influence the Mark II scoring: elongated words lead to higher scores. Also, the Mark II is susceptible to individual differences. Consequently, the comparison has to be made in the same person between a non-stressful condition and a stressful condition, rather than between people in the non-stressful condition and people in the stressful condition. More research is needed to enhance the reliability and validity of the Mark II.