

## DoDPI Research Division Staff (2001)

DoDPI Research Division Staff, Meyerhoff, J. L., Saviolakis, G. A., Koenig, M. L., & Yurick, D. L. (2001). Physiological and biochemical measures of stress compared to voice stress analysis using the computer voice stress analyzer (CVSA). (Report No. DoDPI01-R-0001). Fort Jackson, SC: Department of Defense Polygraph Institute, & Washington, DC: Walter Reed Army Institute of Research.

The present study investigated the computer voice stress analyzer (CVSA) for its ability to identify stress-related changes in voice. Also, investigators compared voice changes indicated by the CVSA to other physiological changes (i.e., heart rate, blood pressure and stress-related hormones) in order to examine any corresponding changes between voice changes and other physiological changes. Previous study results have been inconclusive as to the reliability and validity of instruments that claim to identify stress-related voice changes. By contrast, previous studies have indicated that stress is related to increases in heart rate, blood pressure and stress-related hormones. Thus, if the CVSA indeed identifies stress-related changes in voice, those voice changes should parallel stress-related changes in heart rate, blood pressure and stress-related hormones.

Twenty-two soldiers at the Walter Reed Army Institute of Research participated in the present study. They appeared before the panel of higher-ranking officers, and took the practice interview. The interview was conducted individually, and each participant answered questions regarding career experiences and goals. Before, during and after the interview, physiological changes were measured, and vocal responses were recorded for the CVSA. Three judges who were blind to the study design examined CVSA outputs and gave numerical stress scores to CVSA outputs.

During the interview, heart rate, blood pressure and stress-related hormones showed increases, as compared to before and after the interview. By contrast, there was no change in stress scores based on the interpretation of CVSA outputs. Furthermore, there was little agreement in stress scores among the three judges. Thus, although heart rate, blood pressure and stress-related hormones showed stress-related changes, the present study provided no evidence to support the CVSA for its ability to identify stress-related changes in voice. More research is recommended to obtain conclusive evidence about the reliability and validity of voice stress instruments in detecting stress and deception.