Brenner, M., Branscomb, H. H., & Schwartz, G. E. (1979). Psychological stress evaluator – Two tests of a vocal measure. Psychophysiology, 16 (4), 351-357.

Investigators in the present study examined performance of the Psychological Stress Evaluator (PSE) in detecting deception and in reflecting nervousness and stress. The PSE is a commercially available vocal lie detector, and it captures inaudible changes in voice. Changes in the PSE recording are argued to be associated with stress, and the PSE has been used to find vocal changes that may reflect stress created by the attempt to deceive. Although the PSE has performed reasonably well in capturing vocal changes during non-deceptive tasks, a number of past studies have found the PSE to be unreliable in detecting deception. The PSE has been also criticized for its subjective scoring method and for the unreliability of scoring among judges regardless of their experience. Moreover, the quality of recoding has been found to influence the PSE scoring. Thus, despite the widespread use of the PSE, more research is needed to evaluate the PSE in the detection of deception.

Brenner, Branscomb and Schwartz (1979) tested the PSE in detecting deception (Experiment 1) and in reflecting nervousness and stress (Experiment 2). In Experiment 1, 20 participants were interrogated based on their personal information. The participants were instructed to deceive the interrogator on 5 questions. The participants were offered a cash reward for successful deception, and advised to produce emotional responses when being truthful in order to hide emotional responses on the 5 deceptive questions. Experiment 1 showed that the PSE did not perform better than chance levels in detecting deception, providing no support for the PSE in the detection of deception. In Experiment 2, 16 participants performed the mental mathematical task of a various difficulty level (i.e., easy to hard). The PSE recoding was used to capture vocal changes that might reflect nervousness and stress related to the difficulty of the mental mathematical task. Experiment 2 showed that PSE scores increased as the difficulty of the task increased. Furthermore, PSE scores mirrored error percentages and self-report nervousness scores such that the increase in PSE scores was related to the increase in errors and nervousness. More interestingly, PSE scores were found to reflect the task difficulty at the individual level. Out of 16 participants, 15 participants showed the increase in PSE scores with the increase in the task difficulty. One negative finding in Experiment 2 was that the PSE scores were influenced by response words. For example, the response word “5” led to higher scores than the response word “2.” Thus, unlike Experiment 1, the PSE performed well in capturing vocal changed due to nervousness and stress related to the mental mathematical task.

Brenner at al. argue that the deception task in Experiment 1 might not produce high enough stress to see vocal changes, or that the PSE might be susceptible to the conscious attempt to produce emotional responses when being truthful. Also, the subjective scoring method might contribute to the failure of the PSE recoding to detect deception in Experiment 1. By contrast, the successful finding in Experiment 2 suggests that stress might indeed produce certain vocal changes that could be captured by the PSE. At the end, Brenner et al. emphasize the complexity of detecting deception that must be distinguished by changes due to other factors. Also, they advise that the PSE should be protected from the influence of the recording quality and the response-word.