

Cestaro, V. L., & Dollins, A. B. (1994). An analysis of voice responses for the detection of deception (Report No. DoDPI94-R-0001). Fort McClellan, AL: Department of Defense Polygraph Institute.

There is some evidence that pitch and spectral energy patterns reflect emotional arousal and stress, and the present study examined pitch and spectral energy patterns of verbal responses that might be related to deception. In the present study, deceptive and truthful responses were recorded, analyzed and compared. Also, the standard polygraph instrument was used to make a comparison to the analysis of pitch and spectral energy patterns in the detection of deception.

A total of 44 participants were assigned to the deceptive group or the innocent group. All participants were given a matrix of numbers and had to complete an anagram for a particular number. The deceptive group completed an anagram for the number 64, and 80 to 89, and the innocent group completed an anagram for the number 84. After completing the anagram, the first examination session took place, and each participant had to answer a set of 7 questions about a number that might come from the anagram. There were 6 sets of 7 questions in the session, and a question was asked for each number from 60 to 66 (e.g., "Did you complete an anagram for the number 60?"). The deceptive group had to make a deceptive response about the number 64, and the innocent group responded "no" to all the 7 questions truthfully. All verbal responses were recorded for the voice analysis, and the standard polygraph instrument was used to collect data in skin resistance, respiration and cardiovascular activity. With the same procedure, the second examination session took place 5 days after the first session.

Pitch patterns showed no particular indication of deception. Using data from pitch patterns, the accuracy rate in the detection of deception was 37%, and it was not different from the chance level accuracy. By contrast, using the standard polygraph instrument, the accuracy rate in the detection of deception was 79%, and it was significantly higher than the accuracy rate using the pitch pattern analysis. Similarly to results of the pitch pattern analysis, no particular spectral energy patterns were related to deception. Thus, it appears that in the present study, pitch and spectral energy patterns did not show any particular change associated with the act of deception. It is possible that one deceptive response was not enough time to induce change in voice, and it might be interesting to examine the possibility of delayed change by requiring more than one response for a question.