

Measurement of emotional involvement in spontaneous speaking behavior

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Measurement of vocal indicators of emotions - in laboratory settings - is typically done by computing the deviation of emotionally charged speech patterns from a neutral pattern (Banse & Scherer, 1996; Simonov *et al.*, 1980). However, measurement of genuine emotional reactions occurring spontaneously poses the problem of comparison with a base-line level. We investigated two methods of measurement involving spontaneous speaking behavior. Both use intra-subject comparisons but they do not require a "neutral" condition. They were applied in two research projects and proved adequate for the assessment of emotional involvement in spontaneous speech.

Method 1

The subjects were 39 diabetic patients presenting different levels of impairment of the autonomic nervous system known to be related to emotional arousal. The latter was induced through the subjects' verbal recall of their emotional experiences of joy, sadness and anger. At the end of each episode they said a standard sentence on the emotion congruent tone. The standard sentence was acoustically analyzed. Upon extraction of basic vocal parameters (Zei & Archinard, 1998), we computed a *Vocal Differential* index, i.e. the ratio between the value obtained in high arousal conditions (anger and joy) and that in low arousal condition (sadness). This resulted in two additional variables per vocal parameter: *Anger/Sadness Differential* and *Joy/Sadness Differential*. The results showed that emotional involvement as reflected in the *Vocal Differential* index is positively correlated with the functioning of the autonomous nervous system. We also computed a cumulative score consisting of the acoustic parameters significantly related to the differentiation of the three emotions. The score was composed of Z values and called *Vocal Arousal* index. It reflected the degree of emotional involvement for each emotion.

Method 2

This pilot study involved 10 breast cancer patients whose coping with illness was assessed through an interview, which allowed us to assess the coping style as well-adaptive or ill-adaptive. It was hypothesized that confrontation with emotional contents during the interview would cause the subjects to encode their emotional reactions into their voices.

In order to establish an individual base line range of vocal arousal, the whole interview was screened for passages of high and low vocal arousal. For each arousal condition the Vocal Differential index was calculated. Vocal Arousal was measured for the passage where the subjects talked about their coping with illness. The position of the Vocal Arousal index inside the base line range was indicative of the coping style. The results also showed that relatively narrow Vocal Differential index was related to coping difficulties.

References

1. Banse, R.; Scherer, K.R.; (1996). Acoustic profiles in vocal emotion expression. *Journal of Personality and Social Psychology*, 70-3, 614-636.
2. Simonov, P.V.; Frolov, M.V.; Ivanov, E.A. (1980). Psychophysiological monitoring of operator's emotional stress in aviation and astronautics. *Aviation, Space and Environmental Medicine*, January, 46-49.
3. Zei, B.; Archinard, M. (1998). La variabilité du rythme cardiaque et la différenciation prosodique des émotions. *XXIIèmes Journées d'Etudes sur la Parole*. Martigny.