

Psychophysiological Synchronization between the Manager and the Subordinate during a Performance Review Discussion

Authors : Mikko Salminen, Niklas Ravaja

Abstract : Previous studies have shown that emotional intelligence (EI) has an important role in leadership and social interaction. On the other hand, physiological synchronization between two interacting participants has been related to, for example, intensity of the interaction, and interestingly also to empathy. It is suggested that the amount of covariation in physiological signals between the two interacting persons would also be related to how the discussion is perceived subjectively. To study the interrelations between physiological synchronization, emotional intelligence, and subjective perception of the interaction, performance review discussions between real manager - subordinate dyads were studied using psychophysiological measurements and self-reports. The participants consisted of 40 managers, of which 24 were female, and 78 of their subordinates, of which 45 were female. The participants worked in various fields, for example banking, education, and engineering. The managers had a normal performance review discussion with two subordinates, except two managers who, due to scheduling issues, had discussion with only one subordinate. The managers were on average 44.5 years old, and the subordinates on average 45.5 years old. Written consent, in accordance with the Declaration of Helsinki, was obtained from all the participants. After the discussion, the participants filled a questionnaire assessing their emotions during the discussion. This included a self-assessment manikin (SAM) scale for the emotional valence during the discussion, with a 9-point graphical scale representing a manikin whose facial expressions ranged from smiling and happy to frowning and unhappy. In addition, the managers filled EI360, a 37-item self-report trait emotional intelligence questionnaire. The psychophysiological activity of the participants was recorded using two Varioport-B portable recording devices. Cardiac activity (ECG, electrocardiogram) was measured with two electrodes placed on the torso. Inter-beat interval (IBI, time between two successive heart beats) was calculated from the ECG signals. The facial muscle activation (EMG, electromyography) was recorded on three sites of the left side of the face: zygomaticus major (cheek muscle), orbicularis oculi (periocular muscle), and corrugator supercilii (frowning muscle). The facial-EMG signals were rectified and smoothed, and cross-coherences were calculated between members of each dyad, for all the three EMG signals, for the baseline and discussion periods. The values were natural-log transformed to normalize the distributions. Higher cross-coherence during the discussion between the manager's and the subordinate's zygomatic muscles was related to more positive valence self-reported emotions, $F(1; 66,137) = 7,051$; $p=0,01$. Thus, synchronized cheek muscle activation, either due to synchronous smiling or talking, was related to more positive perception of the discussion. In addition, higher IBI synchronization between the manager and the subordinate during the discussion was related to the manager's higher self-reported emotional intelligence, $F(1; 27,981)=4,58$; $p=0,041$. That is, the EI was related to synchronous cardiac activity and possibly to similar physiological arousal levels. The results imply that the psychophysiological synchronization could be a potentially useful index in the study of social interaction and a valuable tool in the coaching of leadership skills in organizational contexts.

Keywords : emotional intelligence, leadership, psychophysiology, social interaction, synchronization

Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development

Conference Location : Chicago, United States

Conference Dates : December 12-13, 2020