Personality Psychology using Heart Responses to Color Stimulus

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Personality can be defined as a dynamic and organized set of characteristics possessed by a person that uniquely influences his cognitions, motivations, and behaviors in various situations. The body of the humans is in direct relation with his personality and these are inseparable that each of them has effects on the other. So it is important to find the relation between physiological and psychological responses. Psychology includes social interaction, child development, mental illness and information processing. Physiology considers the organization of the brain, heart and body of mammals and humans, from the molecular level to the organism as a whole. The Lüscher Color Psychology Test measures a person’s psychophysical state, his ability to withstand stress, perform, and communicate. It uncovers the cause of psychological stress, which can lead to physical symptoms. This test is based on color selection in four levels of preference. In this paper, we try to use heart response and particularly time domain features of heart rate variability to find the colors preferences without asking the subjects directly. For this purpose, we used four main colors in psychology, blue, yellow, green, and red, as a visual stimulus while the lead II of ECG was recorded from 16 girls as subjects during the stimuli. Then we used time domain features of HRVs to classify four different levels of performances. Kruskal-Wallis test which is a nonparametric version of ANOVA analysis distribution was used to define the level of significance of each feature for different groups of performances to demonstrate the usefulness of them. The results show that these features such as NN50 and RMSSD are able to distinguish between different performances levels by $p<1E-3$. This method cancels the possibility of making mistake in color selection by subjects and suggests the automatic system for personality psychology without their consciousness.