

## The Relationship between Fluctuation of Biological Signal: Finger Plethysmogram in Conversation and Anthropophobic Tendency

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**Abstract :** Human biological signals (pulse wave and brain wave, etc.) have a rhythm which shows fluctuations. This study investigates the relationship between fluctuations of biological signals which are shown by a finger plethysmogram (i.e., finger pulse wave) in conversation and anthropophobic tendency, and identifies whether the fluctuation could be an index of mental health. 32 college students participated in the experiment. The finger plethysmogram of each subject was measured in the following conversation situations: Fun memory talking/listening situation and regrettable memory talking/ listening situation for three minutes each. Lyspect 3.5 was used to collect the data of the finger plethysmogram. Since Lyspect calculates the Lyapunov spectrum, it is possible to obtain the largest Lyapunov exponent (LLE). LLE is an indicator of the fluctuation and shows the degree to which a measure is going away from close proximity to the track in a dynamical system. Before the finger plethysmogram experiment, each participant took the psychological test questionnaire "Anthropophobic Scale." The scale measures the social phobia trend close to the consciousness of social phobia. It is revealed that there is a remarkable relationship between the fluctuation of the finger plethysmography and anthropophobic tendency scale in talking about a regrettable story in conversation: The participants ( $N=15$ ) who have a low anthropophobic tendency show significantly more fluctuation of finger pulse waves than the participants ( $N=17$ ) who have a high anthropophobic tendency ( $F(1, 31) = 5.66, p < 0.05$ ). That is, the participants who have a low anthropophobic tendency make conversation flexibly using large fluctuation of biological signal; on the other hand, the participants who have a high anthropophobic tendency constrain a conversation because of small fluctuation. Therefore, fluctuation is not an error but an important drive to make better relationships with others and go towards the development of interaction. In considering mental health, the fluctuation of biological signals would be an important indicator.

**Keywords :** anthropophobic tendency, finger plethymogram, fluctuation of biological signal, LLE

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