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The individual difference of the near infrared hemoencephalography at the personality assessments

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Personality Assessment by the nIR-HEG

The personality measurement through the experimental methods could be specify the factors within the individuals. Therefore, it was possible to specify various intra individual differences within the subjects. In this research, we measured the near infrared hemoencephalography (nIR-HEG) that occurs in the task of the personality assessment by the experimental methods. And the experiments were to capture the personality traits from the individual difference by the nIR-HEG.

Purpose

This experiment was to capture the personality traits from the individual difference by the nIR-HEG. Whether the personality traits could be detected by nIR-HEG under the different conditions.

Method

Participants The participants were 21 graduate students (13 males, 8 females)
Experiment period May-December 2014
Equipment ProComp TM7500(Thought Technology Ltd, Canada) was measured electroencephalography(HEG), a laptop computer (Dell-Vostro 3360), E-prime 2.0 (psychology software tool), and headphones., Saliva amylase (NIPRO;27B1X00045000073)
Experiment Stimulus By referring to a manual of Big5 (Murakami and Murakami, 2008), we selected each four terms for five personality traits.

Table1. The stimuli terms of personality self-rating

Practice Stimuli	sincere	amenable	philosophical	
Extraversion	active	sociable	passive	restrained
Agreeableness	kindly	affable	headstrong	tightwad
Conscientiousness	capable	conscientious	sloppy	unreliable
Emotional Stability Stimuli	easygoing	sedate	irascibleness	worrier
Openness to experience	intelligent	clever	conservative	naivety

Procedure

The nIR-HEG was compared in such six conditions

1. Baseline with closed eyes and resting (CL)
2. Interview & Big5 inventory (BF)
   Practice trial（15trials）
3. Simple response condition (S1)
4. personality self-rating condition by term. (S2)
5. personality self-rating condition by sentence. (S3)
6. Inventory: BIS/BAS, Lie scale by MMPI . (QA)

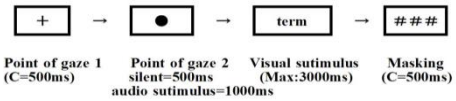

Fig 1. Simple response session

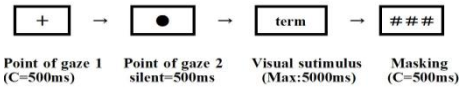

Fig. 2. Personality self-rating session by term and sentence

Analysis

The two way ANOVA based on random block design was performed on the nIR-HEG as the dependent variable with task difference and individual difference as the independent variables.

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Result

The Individual differences of nIR-HEG of participants was shown in Fig. 1. I was significant difference between the participants (*F(20,105)=46.45, p.<.001*). The value of nIR - HEG is greatly affected by individual differences.
The variation of nIR-HEG under six conditions was shown in Fig. 2. It was no significant difference between the six conditions that pooled participants (F(5,120)=0.83, n.s.). The personal traits could not be extracted by comparison between conditions simply.
The result of 2-way ANOVA: The effect of Individual differences was recognized (F(20,100)=65.70, p.<.001). The performing personality assessment task that the nIR-HEG rates varies recognized within the every individuals (F(5,100)=9.71, p.<.01).

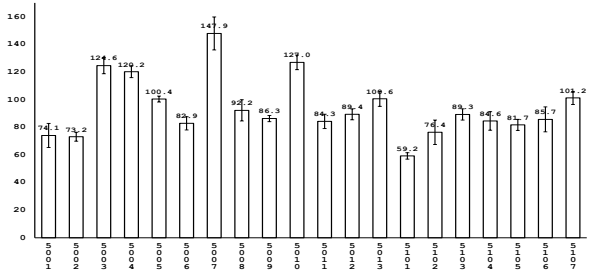

Fig. 1 Inter-Individual differences of nIR-HEG

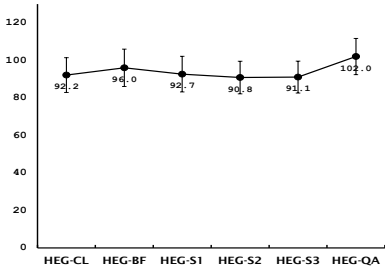

Fig. 2 Inter-Conditionals differences of nIR-HEG

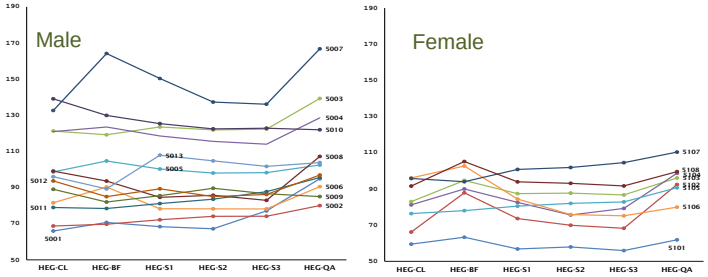

Fig. 3 Intra-Individual differences of nIR-HEG

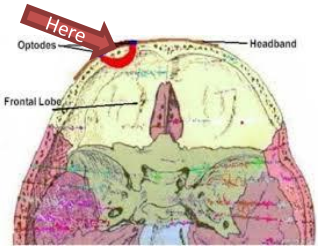

Fig.4 The site of nIR-HEG

Discussion

The two hypotheses were supported. As a result, the intra-individual differences by the nIR-HEG related with the personality traits by in six conditions, baseline, three RT sessions and two questionnaire scale session. That intra-individual differences suggested that personal patterns of nIR-HEG could be used as the indicator of personality traits like questionnaire profile.

Conclusion

It could be possible to measure personality traits by nIR-HEG using intra-individual differences like personal profile of personality questionnaire tests. The concept of intra-individual differences is applied to experiments and the interaction will be used as personality indexes.