In Search of the Possibility to Evaluate the "Kansei"

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Physiological anthropology differs from most other fields of anthropology, since it is highly specialized in studies on man under modern technological civilization. The knowledge of the characteristics of man living in the modern society is requisite to ensure the quality of life, so various areas and parts of the society have shown sincere concerns to the developments of this science. The need and requirement of modern society to physiological anthropology seems to have an enough understanding of human characteristics for developments of new form of technology. On these lines, "Kansei" has been investigated in this science.

The study on the mood or impression of artificial lighting, which was carried on my old laboratory, could be adduced as an example. The heart rate variability was estimated under three levels of color temperature and three steps of illumination level The changes in lighting conditions did not bring about any significant effects on the heart rate but caused obvious effects on the heart rate variability. Moreover, such a wide change in the illumination level between 100lx and 900lx did not produce a significant change in the power spectrum but the change in the color temperature between 300K and 6700K caused statistically significant changes in the heart rate variability. The respiratory sinus arrhythmia component and Mayer wave related sinus arrhythmia component of the power spectrum increased under higher color temperature conditions. The EEG topography was compared under various lighting conditions. The amplitude of Fm-theta during VDT tasks was confirmed to be less under 7500K of color temperature comparing with the other color temperature conditions. The asymmetry in the power of beta wave in the right hemisphere was largest under 7500K. The event related potentials such as N_{100}, P_{300} and CNV were recorded also under different color temperature conditions. The power of N_{100} and P_{300} and both the early and late components of CNV were larger under high color temperature lighting such as7500K comparing with lower color temperature lighting. Task performances measured by the reaction time and error rate were insensitive to the color temperature of light. These experimental results suggest that high color temperature would produce such harm effects as over-accelerations of autonomic nervous activities and mental strain and contradict Kruithof's supposition and the current recommendation of such high color temperature range as over 4500K in Japan.

The Illuminating Engineering Society North America published several documents stressed the importance of non-visual effect of the artificial

lighting. The documents often referred a series of articles of environmental psychology as representative researches on lighting mood or overall evaluative impression of artificial lighting. These representative studies succeeded to identify four lighting modes as the effective variables to impression including preference and pleasantness; that is color temperature (visually warm – visually cool), bright – dim, overhead – peripheral, and uniform – nonuniform. The research techniques they used were mainly the semantic differential scaling method and multi-dimensional scaling method. Their main results consists of two categories: 1) the four lighting modes generate the following five categories of particular impressions; relaxation, privacy or intimacy, pleasantness & preference, spaciousness, and visual clarity. 2) The relationship of categories of impressions and lighting modes can be defined with a light structure model (three-dimensional model of lighting mood). Three factors of the three dimensional model were overhead/peripheral, uniform/nonuniform, and bright/dim. The factor of color temperature mode was not included in this model, since it showed the weakest influence of the four modes. Therefore, according to these researches, the impression of relaxation can be managed with the peripheral and nonuniform modes. This documentation is marked different from my study. Many factors would be related with the causes of this difference. Among them, the below seem to be worthwhile to discuss on the context of this paper.

In cases of semantic differential scaling method, the responses of subjects are obtained by means of verbal or writing procedures. All the analysis starts from the words of subjects. The conclusion derived from semantic differential scaling method is completely based on the words of subjects. The verbal responses and writing responses reflect intellectual process in the brain. But it could be denied that such intellectual process has occupied and held all of human responses. The choice, preference, decisions or behavior of human is not only driven from intellectual process but also come from a sort of sensibility that is beyond the word expression. For all ages and in all places human beings have believed the existence of a different way to evaluate the value of things from consideration or inquiry. Many philosophers have pointed out the two domains in human mental systems. I. Kant systematized the domains of Verstand und Sinnlichkeit. It has been considered the functions of Verstand and Sinnlichkeit are independent and mutually unchangeable. Verstand cannot know intuitively and Sinnlichkeit cannot think. The terms of Verstand and Sinnlichkeit are translated into Japanese language as Gosei (intelligence) and Kansei (sensibility), respectively.

The method possible to evaluate the Kansei is being looked for. The Kansei is a mental system that is unrelated with language system. Therefore, it is impossible to be evaluated with verbal responses or semantic differential scaling. The responses such as EEG topography, event related potentials, heart rate variability may reflect physiological process explained verbally and also the process beyond the language, that is the Kansei. These common procedures in physiological anthropology have a capacity to evaluate the Kansei.

Given that physiological anthropology has practical field aiming to bring about human happiness as its ultimate goal, it is self-evident that humane stance is essential in this context. Both from theoretical and practical viewpoints, physiological anthropology needs to have an enough and sufficient understanding of human characteristics. At the present, one of the expectations to physiological anthropology is to promote and realize the approaches to the Kansei.