

#### 4B13 Dressing Behavior in the Cold under the Influences of Menstrual Cycle and Light Intensities

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The purpose of the present experiments was to study the effects of the menstrual cycle and bright light exposure during the daytime on dressing behavior in the cold. Main results are summarized as follows: 1) Most subjects dressed more quickly and with thicker clothing in the luteal phase than in the follicular phase. 2) They felt cooler in the luteal phase during the last 30 min of the temperature fall from 30°C to 15°C. 3) Most subjects dressed more quickly and with thicker clothing in the dim light of 10 lux during the daytime and felt cooler during the last 30 min of the temperature fall.

#### 4B14 EFFECTS OF THE DIFFERENT LIGHT INTENSITIES ON SOME PHYSIOLOGICAL PARAMETERS IN TERMS OF CIRCADIAN RHYTHM

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The aim of the study was to elucidate effects of different light intensities (40lx-dim or 4000lx-bright) applied during the daytime on circadian rhythms of core temperature, skin temperatures, heart rate and arterial blood pressure. Experiments were performed in a bioclimatic chamber under constant temperature and humidity. Six female students served as subjects. Main results were that core temperature and systolic blood pressure during nighttime were kept significantly lower in bright light than in dim light conditions.

#### 4B15 Effect of Color Temperature of Lighting on Autonomic Nervous Function

— Considering the menstrual Cycle —

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Autonomic nervous function was evaluated by heart rate variability (HRV) in this report. The subjects were seven female students with a regular menstrual cycle. HRV was measured during VDT task and rest just after task in three phases; premenstrual, menstrual and intermenstrual phases. The lighting conditions were three color temperatures (3000K, 5000K and 7500K) at 600lx.

Results obtained in resting state showed that LF component of HRV under 3000K was significantly lower during premenstrual phase. On other hand, HF component was not affected by color temperature and the menstrual cycle. These results suggested that sympathetic nervous activity was diminished under lower color temperature during premenstrual phase.

#### 4B16 The effect of luminance of lighting source on CNV

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In evaluation of environment with CNV, it's important to prove the existence of inverted-U relationship between arousal and CNV. So we examined the effect of luminance of lighting sources on CNV. Subjects were seven males students. The CNV, which was evoked between warning stimulus(S1) and imperative one(S2), was measured under the five conditions(10,100,320,1000 and 1800cd/m<sup>2</sup>) for about ten minutes. Power spectral densities of  $\alpha$ (8~13Hz) and  $\beta$ (13~20Hz) for 2sec. before S1 was calculated by FFT. The early CNV (500~1000 msec after S1) and the rate of  $\alpha$  wave were used as criterion of arousal level. The early CNV under 320cd/m<sup>2</sup> was highest significantly. There was a positive correlation between logarithm of luminance and the rate of  $\alpha$  wave. These results meant that luminance had an effect on arousal level and that the high arousal caused decline of the early CNV. It was suggested that there might be inverted-U relationship between arousal and CNV.

#### 4B17 The Seasonal Effects of Color Temperature of Lighting on Body Temperature Regulation at Cold Environment

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The purpose of this study was to examine how the color temperature of lighting affected temperature regulation at cold environment in summer. Subjects were seven male student and brought up in Kyushu island. The subjects were exposed for 90min on a bed to one of combined environment three color temperature (3000K, 5000K, and 7500K at 500lx) and two ambient temperature (15°C and 28°C with Rh50%) conditions. Rectal temperature, skin temperature, oxygen intake, and morphological parameter were measured. The decrease of rectal temperature and skin temperature and oxygen intake per body weight were not changed among the color temperature conditions. Furthermore, there was significant negative relation between the decrease of rectal temperature and body surface area per body weight under 5000K and 7500K in a cold environment. The results were similar tendency to the past report.

#### 4B18 Combined Effects of Mental Workload and Colour Temperature of Lighting Sources on HRV

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The purpose of this study was to examine how mental workload and colour temperature affect HRV during task and rest. Subjects were eight healthy young males. The task was consisted of finding a lacking number among seven numbers. The conditions of MWL were 10%, 30%, 50%, 70%, 100%, and 150% of the maximum workload. Six task requirements were carried out for 10 minutes, with which two colour temperature conditions of 3000k and 7500k were combined. The result showed that combined effects of colour temperature and MWL were found during the tasks in HF but not in LF/HF. The level of HF was almost constant in whole tasks at low colour temperature while HF was lowered at high colour temperature under workload more than 70%. It is suggested that the low colour temperature environment was desirable in higher degree of mental workload requirement.