

B-11 A comparison of the "kanga" and the bathing suit under the conditions of shower bathing

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The purpose of this research is to clarify the psychological and physical differences between the "kanga" and the bathing suit when the conditions of temperature and humidity were changed. The physical differences were objectively measured in terms of skin temperature, rectal temperature, heartbeat, and change of physical weight. The psychological differences were subjectively measured in terms of a sense of temperature and humidity, and a feeling from the texture of the materials. Our lab evaluated the above two types of clothes on the human body by means of six females wearing three types of swimwear -- bathing suits, bathing suit-shaped "kangas", and the long, loose "kanga". The temperature and humidity were determined under three conditions -- 28C50%, 35C50%, 35C80%. As a result of this experiment, when the temperature and humidity were 28C50% the average skin temperature varied according to the three types of swimwear. The skin temperature of the belly also varied according to the three types of swimwear. The skin temperature indicated differences on only the part of the belly that was covered with material. Furthermore, a feeling from the texture of the materials varied according to each condition.

B-12 Experimental Construction of a CAD-MANNEQUIN Making It Possible to Simulate the Load of the Muscle, During the Postural Changes of the Arm

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The aim of this study is to evaluate a product ergonomically during planning a product by COMPUTER-AIDED SIMULATING, replacing usual method which has been carried out by way of TRIAL AND ERROR. In this experiment, we recorded the data of some postures of the arm and constructed experimentally the UNIQUE SYSTEM based on it.

Each subjects had 16 kind of postures, the shoulder angle is 0,30,60,90 degree and elbow angle is 0,30,60,90 degree, in addition the manual handling load is 1kgf and 3kgf.

We recorded the EMG, from 5 sites for 10 seconds, while a subject had kept the specified posture. EMG were elicited from 5 muscles shown below.

M.trapezius, M.deltoideus(side), M.deltoideus(front), M.biceps brachii, M.brachioradialis

With these results multiple regression analysis were used to obtain regression equation which was used in this system.

B-13 Evaluation of local muscular load while using hand tool by means of APD Analysis

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APD analysis is one of way to evaluate working local muscular load. In this study, we used this analysis to evaluate muscular load while using hand tool.

In the experiment, EMG of four muscle of the arm (trapezius, deltoideus, biceps brachii, triceps brachii) were measured while screwing up from two directions (horizontal forward, vertical upright) using electrical hand screw driver, and hair drying. EMG were analyzed using computers. As a result, during the use of screw drivers, working upright, excessive load were measured in trapezius, and while using hair dryers, suspected as suitable time. In this way, evaluation of muscular load under dynamic working condition were made possible.

B-14 Temporal Controlability of Pianists as a Function of Their Skill

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To measure the temporal controlability of pianists, fluctuations in equaled time interval tapping by music department students were observed. Students were classed by piano performance skill. Fluctuations were analyzed using Fourier analysis. Unskilled performers generated larger fluctuations than skilled performers in short periods which were less than several taps. Moreover, unskilled performers generated large fluctuations in long periods which were more than one hundred taps. There were no significant differences in the middle period fluctuations in the skill of pianists. This demonstrates that skilled performers have great control in their reflective finger motion and preserve the same tempo during long periods better than unskilled pianists.

B-15 The Psychological Mechanism which Governs the Human Control of Equaled Time Interval Tapping

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To clarify how pianists and untrained musicians can keep the same tempo, temporal fluctuations of equaled time interval tapping were observed in various tempos. Six music department students were used as subjects. The tempos of 180ms, 370ms, 800ms for every tap, and an arbitrarily chosen tempo by each subject were used in the experiment. Each subject tapped a micro switch 700 times continuously as regular as possible for each tempo. The fluctuations obtained were analyzed using Fourier analysis. For short periods which were less than about 20 taps, the magnitude of fluctuations were small. For long periods which were over about 20 taps, however, the magnitude of fluctuations increased as the period increased. This was true for all tempos and all subjects. This suggests that there exists a memory capacity of about 20 taps which governs equaled interval tapping.

B-16 Effect of Respiratory Function on Aerobic Work Capacity in Paraplegics

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The objective of this study was to describe the association between peak oxygen uptakes (peak VO₂) during wheelchair exercise and respiratory function in paraplegics. Fourteen male paraplegics including six athletes were recruited for participation in the present study. Each subject wheeled his everyday wheelchair on a treadmill until volitional exhaustion. Prior to the maximal test, pulmonary functions such as tidal volume, vital capacity, and residual volume, were measured. Although vital capacity and peak VO₂ were independent of the level of spinal cord injury (LSCI), residual volume was dependent on LSCI. Thus, there was no relationship between residual volume and peak VO₂. On the other hand, vital capacity was significantly correlated with peak VO₂. In addition, vital capacity and peak VO₂ of athletes were significantly greater than those of nonathletes. Vital capacity of athletes in this study was considered to be improved by physical training. It seems reasonable to conclude from these results that vital capacity might be one of the stronger determinants of peak VO₂ in paraplegics than normal subjects.