

Study on the usability of storage furniture for the aged

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This study examined the role and effect of physiological and psychological measurements of users on the design of chest, especially that of the elderly, with a focus on ergonomics.

First, the maximum upper limb muscular strength (MMS) was measured when handling chest, and considered the relation of expressible power, height and posture. A clearly inferior level of expressible MMS when operating drawer was found in the elderly, suggesting a need for design that accommodates for the age-related decline in MMS. Furthermore, suggesting that it is important for design to incorporate methods that facilitate power expression. Regarding the appropriate height of operation, as working posture difference in age and sex, suggesting the importance of considering ordinary operating posture.

Next, Based on measurements of center-of-gravity (CG) distortion when operating chest, we considered the relation with height. CG distortion increases with age, and this phenomenon was pronounced in the aged when operating furniture, especially when operating at a high position, indicating that this requires careful attention. A tendency for the body to become unstable when opening drawers was also noted.

Furthermore, we conducted psychological evaluations using the SD standard to determine the impression made upon presentation of materials. We considered age-related differences in valuation and the varying impressions made by different woods. A tendency for the valuation of wood type to become increasingly ambiguous with age was found. A tendency for materials with the same level of brightness to be given the same value was also detected, suggesting the possibility that brightness directly influences valuation.

Based upon these experiments, various tendencies were identified and a good grasp of the particular issues related to elderly users of furniture was established. Furthermore, regarding furniture design, the data from this study should enable informed decisions to be made on overall measurements, the size of individual parts, the force required to open and close drawers, methods of operation, materials and so on.

Effects of thermal environment on thermoregulation in the elderly and the young males

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This study aimed to evaluate the difference of the acclimatizing ability to thermal environment between the elderly and the young. Healthy seven elderly (62.6 yrs) and seven young males (22.7 yrs) participated in this study as the subjects in the winter season. After resting for 60 min in a pre-room at air temperature of 28 degree C, the subjects were exposed to three thermal conditions (20, 28, and 36 degree C) for 90 min in a climatic chamber, respectively. Then, they returned to the pre-room (post-room) and rested for 30 min. Oral and skin temperatures (T_{oral} and T_{skin}) in 9 points were measured every 5 min.

Delta T_{oral} from the start value of the elderly was significantly lower ($P < 0.01$) than that of the young after 30 min in 20 degree C, and higher ($P < 0.01$) than that of the young at the middle of the heat exposure (36 degree C). Compared with the elderly, delta mean T_{skin} of the young was significantly lower at the beginning ($P < 0.01$), at the end of the cold exposure ($P < 0.05$) and at the post-room ($P < 0.01$), and was significantly higher ($P < 0.01$) at the beginning of the heat exposure but lower at the end of heat exposure ($P < 0.05$) and also at the post-room ($P < 0.01$). Delta T_{skin} of the peripheral parts such as the backhand and the instep of the young were significantly lower ($P < 0.01$) than those of the elderly throughout the cold exposure. Delta T_{skin} of the peripheral parts of the young were higher than those of the elderly at the beginning of the heat exposure, and delta T_{skin} of the trunk such as the abdomen of the elderly was significantly higher ($P < 0.01$) than that of the young throughout the heat exposure.

These results suggested that physiological responses to cold and hot environment in the elderly were less and more delayed than those in the young, especially at the peripheral parts of the body, and that core temperature was more affected and the change of core temperature was greater in the elderly than that in the young. We speculated that the difference of thermoregulatory responses between the elderly and the young was mainly induced by the degradation of the vasomotor ability with the aging.