Effects of Different Types of Housing Environment on Physiological Response

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Introduction

Wood-frame building create wooden environment only by people activity test, for humans to live meaningful, must take into account the psychological interaction relationship between people and the environment. Wood-frame building is a comprehensive space environment, and also is a ecosystem with people-centric. Perception of the environment is through the people behavior and psychology to reflect, it includes both the physical environment as well as psychological environment.

Materials and Methods

The sample consisted of 20 volunteer(10 male, 10female) from different trade backgrounds. The mean age was 27.15 years, and ages ranged from 25 to 35 years of age.

This experiment at the low carbon demonstration exhibit in Suzhou Crownhomes CO.,LTD in China. To choose time is October - December, selected three different building types (Fig.1-3) for testing in three different weather condition (sunny day, cloudy day, rainy day)respectively. The experimental apparatus used CAPTIV (Fig.4).

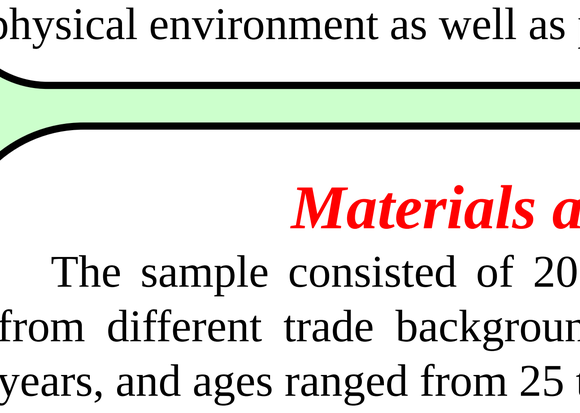

Fig. 1. Log structure

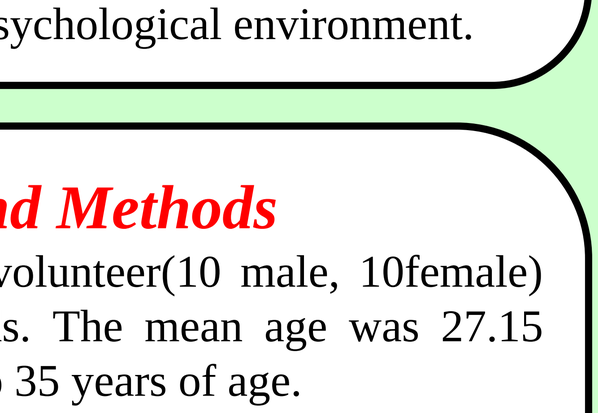

Fig. 2. Glulam structure

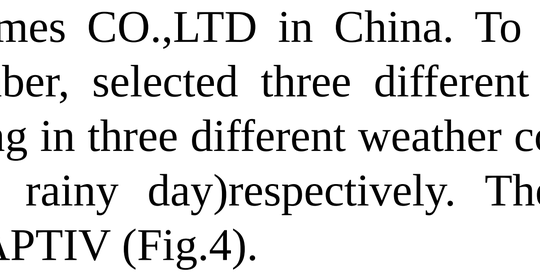

Fig. 3. Reinforced concrete structure

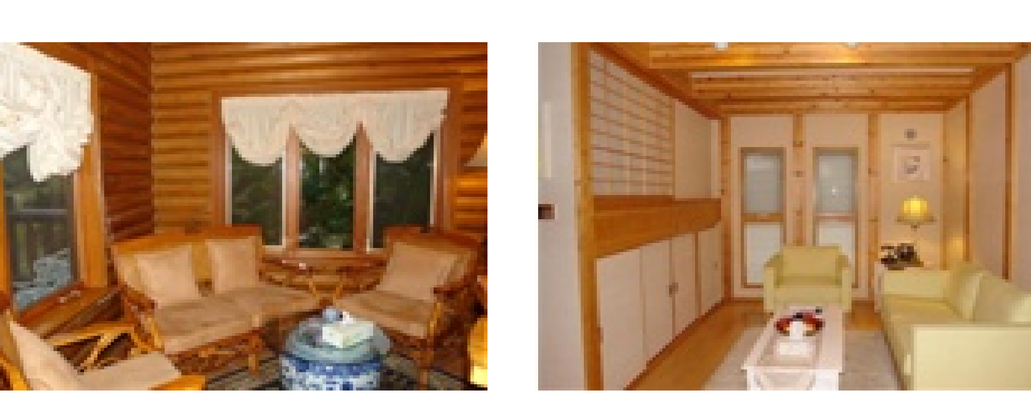

Fig. 4. CAPTIV behavior synchronous analysis diagram

The house orders of trials were randomized for each participant. Subjects respectively into the house of three different types for staying 8-10 min in three kinds of weather conditions. To ensure that individual physiological indexes returned to baseline levels provided a rest period between 10 min (you may extend if desired)between experiment and the experiment .

Results

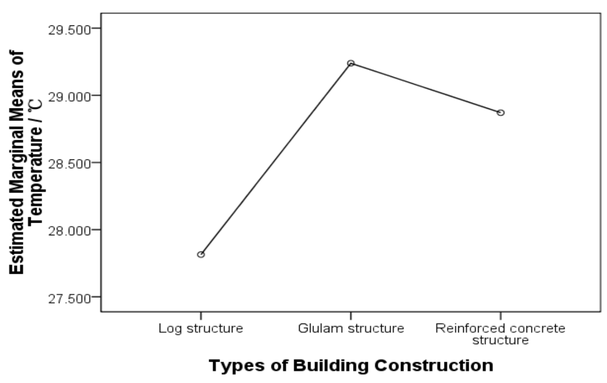

Fig.5. Comparison of different structure housing environment on Temperature

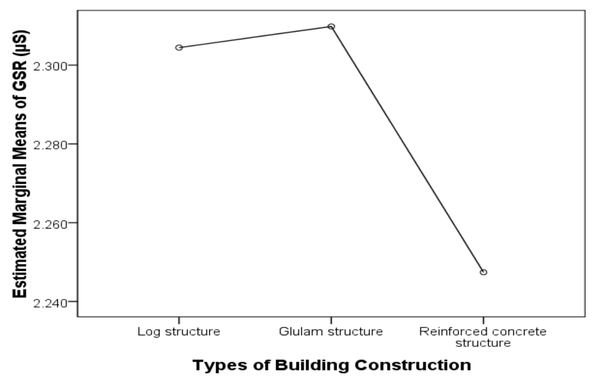

Fig.6. Comparison of different structure housing environment on GSR

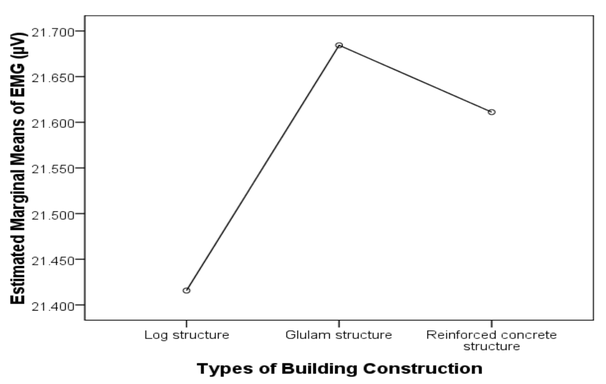

Fig.7. Comparison of different structure housing environment on EMG

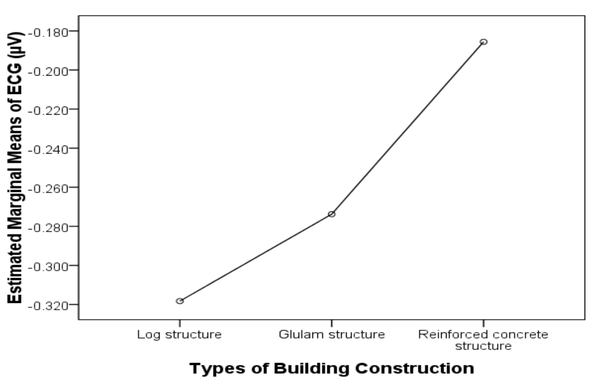

Fig.8. Comparison of different structure housing environment on ECG

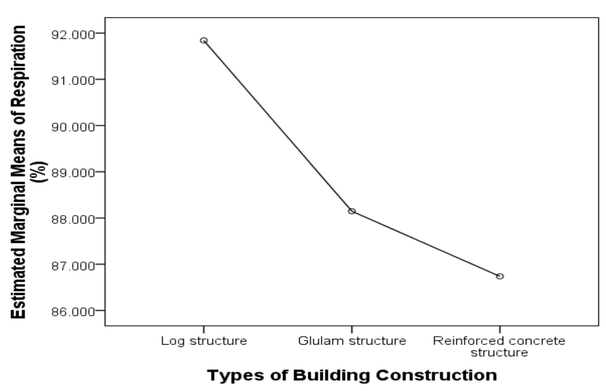

Fig.9. Comparison of different structure housing environment on Respiration

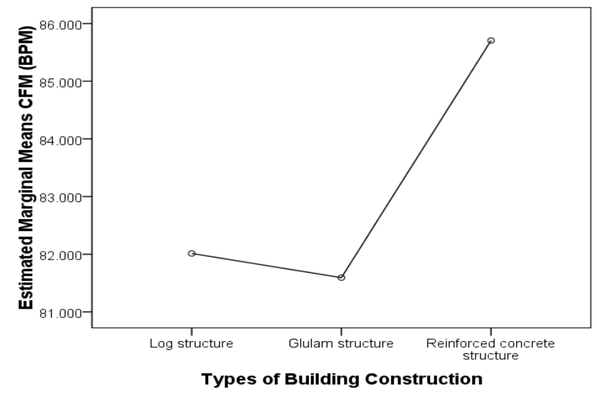

Fig.10. Comparison of different structure housing environment on CFM

Conclusions

Participants in glulam structure building environment index of skin temperature is higher than the log and reinforced concrete structure, reinforced concrete structure ECG index is higher than log and glulam structure, log and glulam structure respiration index is higher than the reinforced concrete structure. This suggests that the participants are not only interested in the log and glulam structure housing environment, but also have cheerful mood and comfortable feeling. Compared with reinforced concrete structure housing, two kinds of wooden structure houses give a person with comfortable state, of which glulam structure housing was slightly better than log structure housing. Quantitative physiological indexes monitoring can well reveal people at different structure housing environment could not be detected by some sensory effects.

Acknowledgments

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