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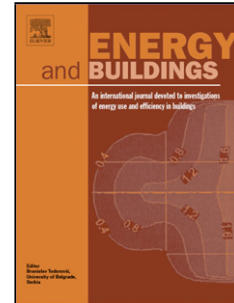
Title: Influences of perceived control on thermal comfort and energy use in buildings

Author: Geun Young Yun

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Influences of perceived control on thermal comfort and energy use in buildings

Geun Young Yun*¹

¹ Department of Architectural Engineering, Kyung Hee University, Yongin, 446-701, Korea

* Corresponding author:

Tel: +82 31 2013859

Fax: +82 31 2021818

E-mail addresses:

gyyun@khu.ac.kr (Geun Young Yun)

Highlights

- Thermal sensation differed with the level of perceived control over the thermal environment.
- The high perceived control group felt cooler than the low perceived control group in summer.
- Self-reported productivity scores were higher in the high perceived control group.
- An improvement in perceived control reduced cooling energy consumption by 9%.

Abstract

This study explores the role of occupants' perceived control in their subjective evaluation of thermal environments and its effects on cooling energy consumption in air-conditioned buildings. Seven air-conditioned buildings with operable windows were selected for field measurements in South Korea. The monitoring data give evidence of a statistically significant relationship between perceived control and the thermal sensations of occupants. The summer comfort temperature for the group with a high level of perceived control over the thermal environment was 0.9°C higher than that for the group with low perceived control. Also, the high perceived control group felt cooler in summer than the low perceived control group. After identifying the effect of perceived control on comfort temperature, dynamic building energy simulations were conducted using EnergyPlus to examine the influence of perceived control on building energy consumption. The simulation results show that

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