Preference of Light Distributions and Colour Temperature in Residential Interiors Between Two Age Groups

W. Sareedeelert, C. Chuntamara
School of Architecture and Design, King Mongkut's University of Technology Thonburi
Chanyaporn.chu@kmutt.ac.th

Lighting in residential interiors can have a significant effect on the residents' moods, perceived well-being, and the overall quality of life. However, most residential interiors in Thailand are normally illuminated with ceiling downlights (daylight colour, 6,500˚K) at low light levels (10 – 100 lux). According to previous studies from the West, this type of lighting installation would result in a rather dull and unfriendly atmosphere. This study aims to investigate the preference of light distributions and colour temperature in Thai subjects - between two age groups. Five light distributions typically used in residential interiors were selected. These were direct downward lighting with linear and point sources, indirect peripheral cove-lights, indirect centre cove-lights, and mixed indirect centre cove-lights with direct down-lights. Cool colour temperature of 4,000˚K and warm colour temperature of 2,500˚K-3,000˚K was included in the study. A scaled-model (1:20) with changeable ceilings and light sources were used to simulate 11 lighting installations.

There were 73 subjects participated in the study; the younger subjects aged between18-39 years old and the older subjects aged between 40-65 years old. The subjects were asked to view each of the lighting installation and to rate their responses on the semantic differential scales. Five subjective responses included preference, comfort, relaxation, friendliness and brightness; the results were analyzed using a statistical package SPSS. It was found that:

1. The indirect peripheral and centre cove lighting mixed with direct down-lights were the most preferred light distributions for both age groups.
2. Lighting installations with warm color temperature appeared to be more preferable than those with cool color temperature for both age groups.
3. In most cases, there seemed to be inter-relationship between the *preference* and the perceived *comfort, relaxation, friendliness* and *brightness* of the lighting installations for both age groups.

The results from this study seem to be consistent with the previous studies in the West and the IES recommendation (1987) for residential light levels. Agreed with Baron et al (1992) and Kruithof (1941), the subjects prefer low levels of illuminance (150-200lux) with warm white light. In addition, at the same light levels, the lighting installation with cool-white light tends to give the impression that the room appears to be brighter than the room lit with warm-white light for both age groups.

Keywords: lighting preference / residential lighting / light distributions / color temperature.