How do you like your light in the morning? Preferences for light settings as a function of time, alertness and mood

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Introduction

Research has shown that lighting can have an influence on wellbeing, health and performance. A higher illuminance and color temperature, for instance, can improve cognitive performance and reduce sleepiness. However, whether lighting preferences reflect these effects is yet unknown. Results of a longitudinal field study by Begemann and colleagues (1995) revealed that on average, office employees' preferred a higher illuminance than prescribed by current standards for office environments, which are mainly based on ergonomic needs for visual tasks. In addition, they found that the light preferences varied with time of day – roughly following a natural daylight curve. These individual light preferences are said to also depend on a person's level of alertness and mood, although this has not been investigated yet. In this study, we explored whether time of day, alertness and mood have an influence on light preference. We hypothesized that people would prefer a more intense and cooler lighting when they felt less alert.

Method

Lighting preferences were assessed in two experiments: one experiment to investigate the preferred light intensity, i.e. illuminance, and one experiment to explore the preferred color of the white lighting, i.e. correlated color temperature (CCT). In both experiments, a mixed-group design (N = 30) was applied in which respondents participated in two to four separate visits resulting in 100 measurement sessions per experiment. Participants first completed the 5-minutes auditory Psychomotor Vigilance Test as an objective measure of alertness. After this test, participants completed self-reported measures of alertness and mood. During this first part of the experiment, the light condition was 500 lux and 4000K at work plane. After completing the subjective measures for alertness and mood, the illuminance was set to 200 lux (4000K) in experiment one. Then participants adjusted the lighting intensity up to the level they felt they would perform best on a subsequent attention task. In the second experiment CCT was set to 3000K (500 lux) after the baseline. Participants subsequently adjusted CCT to their optimal level. To avoid a stimulus range bias – Fotios and Cheal (2010) suggested that participants tend to adjust the lighting to the middle of the range in preference tests – the paradigm was designed such that participants could only alter lighting settings upward, i.e. increase the illuminance or CCT up to the point they felt the lighting was optimal. After adjusting the light, participants completed the Attention Network Task and evaluated the lighting condition, and reported their beliefs concerning the effect of light on performance and mood.

Analysis & results

Data collection is currently in progress. The results will be presented at the conference. These results will illustrate the fluctuation of light preferences over the day and as a function of alertness and mood. In addition, these results will provide insights in whether time of day, subjective or objective alertness is the best predictor for light preferences during daytime.

References

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