

# How do you like your light in the morning? : preferences for light settings as a function of time, daylight contribution, alertness and mood

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# How do you like your light in the morning?

Preferences for light settings as a function of time, daylight contribution,  
alertness and mood

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Research has shown that lighting can have an influence on wellbeing, health and performance. In this study, we explore whether lighting preferences reflect these effects. Results of a longitudinal field study by Begemann and colleagues (1997) 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, daylight contribution, alertness and mood have an influence on light preference. We hypothesized that people would prefer more intense light when they felt less alert.

## Method

Preferred light intensity, i.e. illuminance, was investigated in two experiments to assess light preferences with and without daylight contribution. In both experiments, a mixed-group design was applied in which respondents participated in two to four separate visits with N = 36 (72 sessions) and N = 27 (78 sessions), respectively. 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). We then asked participants to select the lighting level they felt would be optimal for performance on a subsequent attention task. 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 in small steps of 100 lux, i.e. increase the illuminance up to the point they felt the lighting was optimal. Participants then completed the Attention Network Task, evaluated the lighting condition, and reported their beliefs concerning the effect of light on performance and mood.

## Results

The results of the first study (without daylight contribution) show that subjective alertness and vitality influence people's light preferences: when participants suffered from sleepiness or a lack of energy, they preferred a higher illuminance level than when they felt more alert and energetic. Participants preferred a higher illuminance than current standards for office environments, especially when participants felt sleepy and less vital. Preferred illuminance correlated only with subjective alertness or vitality, not with objective alertness. We also did not see lighting preferences vary according to the daylight curve, as reported in Begemann and colleagues (1997).

Data analyses of the second experiment (with daylight) are still ongoing and will provide insights into whether daylight exposure also plays an important role in light preferences throughout the day. We expect that here preferences will follow the daylight curve, as participants may try to balance the luminance on the desk with that of the window.

## References

- Begemann, S.H.A., van den Beld, G. J., & Tenner, A.D. (1997). Daylight, artificial light and people in an office environment, overview of visual and biological responses. *International Journal of Industrial Ergonomics*, 20, 231-239.
- Fotios, S. A. & Cheal, C. (2010). Stimulus range bias explains the outcome of preferred-illuminance adjustments. *Lighting Research and Technology*, 42, 433-447.