Dynamic lighting design

A transdisciplinary investigation and operationalization of dynamic lighting design criteria that supports health and wellbeing

Linnebjerg, Sofie

Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

Link to publication from Aalborg University

Citation for published version (APA):

General rights
Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

? Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
? You may not further distribute the material or use it for any profit-making activity or commercial gain
? You may freely distribute the URL identifying the publication in the public portal

Take down policy
If you believe that this document breaches copyright please contact us at vbn@aub.aau.dk providing details, and we will remove access to the work immediately and investigate your claim.
Introduction to the concept of dynamic lighting design

The importance of dynamic light to support health and well-being has been more and more recognized [Hansen et al., 2017]. Humans have through many years of evolution adapted to the changing light of the sun, varying through the day, seasons and under various weather conditions, creating a multitude of light settings. Humans live in interaction with this dynamic light and consider it as a natural part of our world [Mathiasen, 2015]. Furthermore, it has been the recent discovery of intrinsically photosensitive retinal ganglion cells in 2002 [Hansen et al., 2002]) become apparent, that light, bears a purpose of enabling visual orientation, also are influencing the internal body clock, affecting sleep-wake cycle, immune response, appetite, behavior, mood, alertness and attention - depending on the duration, timing and quality of light [Schnellenberg, 2014]. But, as humans spend more than 90% of the time inside a built environment [Kleppe et al., 2001] and the daylight intake in our buildings is not always optimal to meet the needs for dynamic light [Hansen et al., 2017], this research project points to the importance of considering the indoor lighting environment that support health and wellbeing as a total sum of electrical light and daylight in a dynamic interplay.

Hypothesis

Combining daylight and dynamic lighting technology in architectural lighting solutions can contribute to better health and well-being.

Objectives

1. To investigate the biological aspects of human needs for dynamic lighting, from the field of natural science.
2. To investigate the phenomenological aspects of human needs for dynamic lighting from the field of architectural research.
3. To establish a set of criteria, that meets the biological and phenomenological aspects of human needs for dynamic lighting.
4. To test the criteria in a set of architectural experiments to validate the criteria’s potential to facilitate dynamic lighting design that supports health and well-being.

References

David W. Begen, Peter A. Dunn, Nishat Taha, Phototransduction by Retinal Ganglion Cells That Set the Circadian Clock, 2002, VNL 256 SCIENCE
Hansen, Ellen Kathrine, PhD candidate: Design research on day-light - a multidisciplinary design element

Conference poster for Velux Daylight Symposium, Academic Forum 2, May 2017