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A full-scale light laboratory in a public space.

To what extent do we agree about the spatial experience that is created through lighting? Do architects and designers experience space in the same way as people in general, or do their experiences change as they develop increased sensitivity? A full-scale laboratory was set up as a temporal lighting installation (from September 24 to October 31, 2010) in a church park in the Swedish town of Alingsås. This research project was undertaken in collaboration with Lights in Alingsås 2010, an annual lighting event linked to an international workshop realized by VIA Educational Events on behalf of PLDA (Professional Lighting Designers Association) and Alingsås City Council.

This paper focuses on design as research and cultural script, where designers are used as informants.

How this research is relevant and useful for lighting designers

As a lighting designer I have discovered the need to know more about how the final design will be

experienced in a real environment and to gain knowledge about other people's experiences and interpretations. A considerable part of our professional skill is tacit and practical knowledge based on our own experience. Only by claiming a theory can a hypothesis be opened up to discussion.

When practised-based research is pursued by designers, new kinds of questions are asked, and this research differs from lighting research generated by sociologists, design historians and engineers. The aim of this architectural lighting research is to provide lighting designers with back-up arguments for discussions with building entrepreneurs and/or customers. An artistically skilled designer may need more support communicating the design whereas a more technical planner may need to know more about how people experience designed spaces in order for them to make well-founded decisions.



The full-scale light laboratory: the church square in Alingsås/S.

New methods for new ways of pursuing practice-based research

Within the field of lighting research there is an urgent need for more complex studies to be made in real life environments. There is a long tradition of studies carried out in isolated contexts. In fact, very little lighting research has been performed from the designer perspective and with visual experience as the point of departure. However, today we have several examples especially in the colour research field that show that a phenomenon cannot be regarded as an isolated entity within a space where a number of elements/aspects interact ¹⁻⁵.

This research is inspired by and based on John Flynn's research on the preference for lit walls and how light can affect how people experience atmosphere ⁶. It is also influenced by Sven Hesselgren's studies on the experience of light in an enclosed space ^{7,8}.

The lighting installation was designed by the researcher according to hypotheses from earlier studies ⁹. The study set-up, which was a conscious design choice, enabled several parameters and questions to be asked about the complex public space at one time; a mixed methodological design that can even be called quasi-experimental was applied ¹⁰. No real space can be seen as isolated from other phenomena such as connected

spaces, connected functions and cultural context. Illumination on some objects changed periodically by using a time-scheduled control system. In this experimental set-up the height of street luminaires was varied to study the effect of spatial size and legibility and how informants experienced a safe atmosphere. Spatial depth and the perceived broadness of a rear wall were studied according to different light patterns on the church façade. Additionally, illuminated trees were studied in relation to spatial delimitation and perceived spatial size.

Lights in Alingsås 2010 attracted 65,000 visitors. During the five weeks the temporal installation was in place, 222 questionnaires and 27 video recorded interviews with 39 informants were collected and discussions took place within three focus groups of skilled observers ¹¹. Several said that the longer they observed the lighting, the more difficult it became to answer the questionnaire. More people were of the opinion that the lower street light level contributed more to how they experienced a safe atmosphere than the higher placement (62 per cent, i.e. 138 persons compared to 57 persons said the higher level was safer). Many described the illuminated park as a place that created a calm, safe, relaxing, warm and inviting atmosphere. It was nice to see that people liked to remain in this place and sit down on the benches despite the cold evening temperatures. The lit trees in combination with the low-level luminaires positioned along the path and beneath the benches seemed to have contributed to an overall experience of increased spaciousness and spatial enclosedness. The informants judged the illuminated trees as the most important factor for the atmosphere in the park being experienced as safe (115 people believed the trees were most important, more than the path, the street and the church facade). Another very interesting phenomenon was the church facade illuminated either with two, three or five sections. When five sections were lit, most people judged the building as being closer and wider (53 per cent), whereas two sections, i.e. when only the corners were lit, created more depth and a longer distance from the observer (49 per cent).

The interviews were analysed through a method developed by sociologists Mats Alvesson and Kaj Sköldbberg



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known as "reflexive interpretation"; in this project, the analysis is based on hermeneutics, postmodernism and critical theory, and its intention is to question the bias and pre-understanding that exist between the researcher, the informants and the local context^{12,13}.

The 'designer-effect', designers as informants

Architects and designers as one category (33 per cent of 222 answers) stand out from the typical pattern of response since they have more diverging answers than people in general, even though many of them also answer in a similar way to the majority. This may indicate that designers as a category are more difficult to grasp and that their predictions do not evidently coincide with people in general. Perhaps people less affected by pre-understanding answer in a more genuine and 'true' way.

On the one hand, a respondent's answering in an unusual way could depend on him or her being able to make more conscious observations due to a professional awareness of different perspectives. On the other hand, cultural scripts related to professional belonging may influence lighting designers or planners to answer according to their daily agendas: for example, people working with traffic security, planning simplicity, cost-efficiency, sustainable environment planning, human-centred or artistic design. Additionally, 'the designer phenomena' may be related to an awareness that it is more important to take one's time when making these visual observations and that more phenomena unfold during the course of time, whereas untrained observers may answer more according to their first impression. However, from the interviews it is apparent that the most obvious difference between trained and untrained spatial observers is that it is easier for trained observers to communicate their experience and that they are able to express themselves in a more nuanced language.

People that do not work with the creation of spaces may not even understand the significance of the research questions. One of the informants, typically a male engineer in his forties, asked "Why is the depth so important?" To me, as an architect, to create space with light is the very essence of architecture, i.e. to make spaces visible, legible and understandable in order to enhance the experience of feeling safe and to facilitate orientation and the understanding of functions. More-over, the depth is what makes a space more or less three-dimensional. One of the experiences gained through this study is that it is much easier to talk about spatial depth by asking in which scenario the informant experiences the building to be nearest instead of talking about when the depth is largest. Findings from an earlier study I made in an auditorium show that designers and architects judge depth differently than others¹⁴. This could both depend not only on the difficulties people have or how used they are to understanding and using the concepts but also on the extent of their sensibility gained from experience and interest in the issue.

In the focus discussion between Nordic colour and lighting researchers in the SYN-TESS network it became apparent that there is a large difference between judging



Lighting the crowns of large trees forms a canopy over the space.

space on images compared to judging space in reality. More possibilities for interpretation present themselves in a real space than on an image. A researcher whose background was in colour design continued with "I did not like the idea of lighting just lit sections on the church and thought five lit sections were best when I looked at the illustrations, but in reality it was the opposite. Five illuminated sections were too strong in reality." Moreover, presentation images are often seductive and biased in order to influence the observers' impression.

The preconceived ideas that the informant below expresses may well be based on an architect's sketching method. We are so used to thinking in simplified images that we possibly, and more easily than others, conclude what we see in a simplistic manner. This thirty-year-old architect, who was familiar with the installation since she had assisted me when testing the lighting, may have imagined all five sections of the church façade illuminated (the whole façade) as a wall with five brightly lit arches. However, at the same time, she may have forgotten the soft character of the graze lighting that brings out the texture of the roughcast surface. Without this the façade would definitely have been experienced as being flatter.

"I had a memory of the light being so strong that it would all feel flat, but it is actually OK. There is still room



A significant number of people considered the uplit trees more important than lit paths or facades.

for darkness and you see the structure. It is not as flat as I remember and perhaps it is also wider. Well, I obviously had some preconceptions."

Another example from an informant who was a male lighting engineer showed that he established his preference for the higher street lights only by looking at the illuminated radius on the ground: "The radius gets bigger with higher placement so I see more. I do not go on the feeling of being safe". Based on my own prejudice, this could be regarded as a typical lighting engineer's view of illumination. Some planners are often so used to maps that they may not take into consideration that the mounting height has an impact on the experienced light level and the amount of vertical light on the façade, which, in turn, has consequences for the way colour is reflected, for the clarity and distinctness of the light experienced, together with the enhanced human scale that pedestrians may feel. Instead of planning merely to obtain an equal distance between the lamp posts, we should make far more observations with our eyes in real spaces – in real streets.

Concluding discussion

The results of this study show that visual experience cannot be generally taken for granted. There are always people whose answers do not align with those of the majority. The diverging patterns of response from the designers are interesting and require further study.

The point of departure for this research is the Swedish lighting culture. My suggestion is that cultural differences in how people experience light should also be studied further. This new exciting field of research requires many more studies to be undertaken and more researchers to take part before we can really shed light on this field.

Keywords: Lighting design research, Research by design, Spatial experience, User experience, Public space, Spatial complexity.

References

- ⇒ 1 – FLYNN, JE., SPENCER, TJ., MARTINIUK, O., HENDRICK, C. Interim Study of Procedures for Investigating the Effect of Light on Impression and Behavior, *Journal of the Illuminating Engineering Society* (3) (1973) 87-94.
- ⇒ 2 – HESSELGREN, S. *The language of architecture*, Studentlitteratur, Lund, Sweden, 1969.
- ⇒ 3 – HESSELGREN, S. *Man's perception of man-made environment*, Studentlitteratur, Lund, Sweden, 1975, part I, p 365, part II, p. 281-282.

- ⇒ 4 – WÄNSTRÖM LINDH, U. Observations of spatial atmosphere in relation to light distribution. Proceedings from the 5th conference on design and emotion 2006, Department of product and production development, division design, Chalmers University of Technology, 27-29 September. Gothenburg, Sweden (2006).
- ⇒ 5 – GROAT, L., WANG, D. *Architectural Research Methods*. John Wiley & Sons, INC, New York, USA, 2002.
- ⇒ 6 – FRIDELL ANTER, K., BILLGER, M. "Colour Research with Architectural Relevance: How Can Different Approaches Gain from each Other?", *Color Research and Application* 35 (2) (2010) 145-152.
- ⇒ 7 – FRIDELL ANTER, K. *What colour is the red house? Perceived colour of painted facades*. KTH Architecture., Stockholm, 2000.
- ⇒ 8 – BILLGER, M. *Colour in Enclosed Space Observation of Colour Phenomena and Development of Methods for Identification of Colour Appearance in Rooms*. Chalmers University of Technology, Gothenburg, 1999.
- ⇒ 9 – HÄRLEMAN, M. *Study of Colour Shifts in Various Daylights: Dominantly Reddish and Greenish Rooms Illuminated by Sunlight and Skylight*. *Colour: Design & Creativity* 1(1):8, (2007) 1-15.
- ⇒ 10 – HÄRLEMAN, M., WERNER, I-B., BILLGER, M. *Significance of Colour on Room Character: Study on Dominantly Reddish and Greenish Colours in North- and South-Facing Rooms*. *Colour: Design & Creativity* 1(1):9, (2007) 1-15.
- ⇒ 11 – KVALE, S. *Interviews: An Introduction to Qualitative Research Interviewing*. Sage, Thousand Oaks, 1996.
- ⇒ 12 – ALVESSON, M., K. SKÖLDBERG. *Reflective Methodology: New Vistas for Qualitative Research*. Sage Publication Ltd., London 2009.
- ⇒ 13 – ALVESSON, M. *Interpreting Interviews*. Sage Publication Ltd., London 2011.
- ⇒ 14 – WÄNSTRÖM LINDH, U. *Spatial Interpretations in Relation to Designer Intentions: A Combined Strategies Study in an Auditorium with Variable Lighting*. In proceedings: ZENNARO, P. (editor), 2010, *Colour and Light in Architecture*, Knemesi, Verona (Italy). Available at http://rice.iuav.it/215/1/08_wanstrom_lindh.pdf.

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Brendan Keely, PLDA/UK

The Point at Lancashire County Cricket Club (LCCC).

This radical redevelopment of the world famous Old Trafford cricket ground is set to transform the historic venue into one of the country's premier sporting destinations. The redevelopment will consist of two new grandstands, a revamp of the existing pavilion, new player and media facilities, a 'big screen' and improved sports floodlighting.

'The Point', completed in 2010, floats dramatically over new spectator seating, creating spectacular views over the pitch and to the Pennines beyond, providing the best 1,000 seat events venue in the North-West.

BDP were appointed to create new facilities that would set the highest standards for international cricket and pro-