

Impact of occupant control and aesthetics on perceived Indoor Environmental Quality (IEQ)

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Context

Several studies suggest that the interaction between different indoor environmental comfort categories (e.g., visual, thermal, air quality and acoustic) may be due to the overall appreciation of the indoor environment [1]–[3]. In particular, occupants tend to be more forgiving when features that they intrinsically like are present (e.g. views out, agreeable decoration, more control, better use of natural light, management, etc.). Beyond physiological responses, the interaction between parameters would occur through compensation and be primarily related to psychological aspects. The questions of what features occupants prefer remains.

Post Occupancy Evaluations (POE) is defined as the process of evaluating buildings in a systematic manner after they have been built and occupied for some time [4]. Focusing on building's occupants and their needs, this method enables us to understand the perception of indoor environment, and this to support productivity and wellbeing. POE usually encompasses occupant surveys which allows to gather subjective evaluation in regard to how users perceive their environment.

Objective

Informed with data from POE conducted in four Minergie buildings in Switzerland (277 individual answers), the objective of this project is to determine what features of the indoor environment are the most determinant to achieve higher indoor comfort. In particular students will be looking at perceived aesthetics (e.g., enjoyment of view, façade) and perceived control (e.g., over temperature, lighting, noise, management responsiveness), and how these two types of features can influence both the overall comfort and the distinct IEQ categories.

Skills, equipment and tools involved

The project involves the following:

- Management of a large dataset (e.g. Excel)
- Analysis of subjective data (e.g. R statistics (preferably) or MATLAB)

Previous experience with any of these would be an advantage. The supervisors will provide initial tutorials to familiarize with the tools as well as support during the semester. This project can be carried by 2 students.

References

- [1] M. A. Humphreys, "Quantifying occupant comfort: are combined indices of the indoor environment practicable?," *Build. Res. Inf.*, vol. 33, no. 4, pp. 317–325, 2005.
- [2] A. Leaman and B. Bordass, "Are users more tolerant of 'green' buildings?," *Build. Res. Inf.*, vol. 35, no. 6, pp. 662–673, 2007.
- [3] M. P. Deuble and R. J. de Dear, "Green occupants for green buildings: the missing link?," *Build. Environ.*, vol. 56, pp. 21–27, 2012.
- [4] W. F. Preiser, E. White, and H. Rabinowitz, *Post-Occupancy Evaluation (Routledge Revivals)*. Routledge, 2015.