Opinion: On becoming smart

As a researcher of light, I frequently encounter the idea of 'intelligent lighting'. Witnessed by the numerous papers that appear, light research is thriving. Undoubtedly this is inspiring many to contemplate smart light solutions, promising visions of ever healthier users or ever more sustainable buildings. Inspired engineers approach user-centred researchers like myself, hoping to learn 'canned' insights to implement in their envisioned systems and services. Flattering as this may seem, I often find myself lost for words or facts to share in such instances – in essence leaving me feeling the exact opposite of what we hope to propagate: unsmart. So today, I would like to suggest three important directives for myself, and researchers like me, in the hope that this will help us, as a community, to grow truly smart.

First, it is paramount to acknowledge the many different needs users may have when it comes to light and lighting. Although it is already challenging to formulate isolated light (or dark) requirements for earlier sleep onset, or for the prevention of glare, the biggest challenge is their comprehensive integration. Genuinely intelligent solutions do justice to all user needs – e.g., vision, comfort, health, performance, atmosphere, and energy-saving. This, to my mind, requires interdisciplinary collaboration to an extent that is scarce, if not unrealised to date. Our European Training Network LIGHTCAP (www.lightcap.eu) is one example of ambitions in this direction. Eight research groups collaborate from disciplines as diverse as neurobiology, cognitive neuroscience, chronobiology, psychology and lighting design and technology. Yet still I am sure we could – and should – include additional domains of expertise if we want to develop well-balanced, integrated solutions.

Second, a fundamental value we have to uphold pertains to fair and responsible dissemination. Unbiased and comprehensive reporting of findings are the foundation of ethically sound science. Still, I have seen – perhaps even felt – the temptation to be somewhat selective in reporting particularly exciting results, or the pressure of journal editors who favoured the more 'newsworthy' manuscripts. More common even is biased referring: citing only those studies that gave unidirectional, significant findings. As every mature scientific domain, we have to acknowledge that findings aren't always consistent. Perhaps we should even be willing to admit that, sometimes, effects of light are modest or of only minimal ecological relevance, even if we risk postponing innovations or disillusioning eager developers of smart systems.

But perhaps most important is that, after we have established and confirmed an effect of light in our laboratories, we proceed with thorough testing in the field. Smart light solutions cater to real people, in real environments, under real light conditions, not to light- and sleep-deprived lab rats in closed white boxes. Participants may respond milliseconds faster to unexpected visual stimuli or their melatonin levels may rise minutes earlier under light of a certain spectrum or intensity, but does this imply that they will finish their work more effectively, or sleep better at home? Will effects persist if they have not been prepped in dim conditions, if they do drink coffee, and have more on their minds than the singular focus of finalising the session? Will any effects be meaningful in light of the rich and chaotic contexts we live in? Will the potential dissatisfaction with this particular light in context not invalidate any potential benefits seen in the confines of the lab?

Truly smart lighting solutions require all of this: they should balance all relevant needs, be based on the full basis of evidence and grounded in the real world. Let us become smart.

Yvonne de Kort, PhD
Eindhoven University of Technology,
Eindhoven, The Netherlands
E-mail: y.a.w.d.kort@tue.nl