Universität Basel

Research Project

Light level and effort-related cardiovascular response

Third-party funded project

Project title Light level and effort-related cardiovascular response
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Organisation / **Research unit**
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Department
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Most people in industrialized countries spend a large part of their life indoors and are exposed to artificial lighting. Thus, it is crucial to investigate physiological and psychological influences of artificial lighting, particularly in the current advent of new technologies for light emitting diodes. The overall aim of this project is to test the facilitating effects of light by manipulating its spectral wavelength composition and illuminance under mental fatigue and sleep restriction conditions. Within this project, based on my current work, I am proposing an integrative theoretical model for lighting level influence on mental effort. The model predicts that, due to effects on alertness, light should impact task demand appraisals and thus invested effort, based on motivational intensity theory. The main dependent variable—effort—is defined as resource mobilization to perform instrumental behavior. Effort will be quantified as changes in beta-adrenergic sympathetic nervous system impact on the heart. This proposal consists of two psychophysiological experiments. In Experiment 1, four light levels will be tested on mental effort intensity. Experiment 2 will test the interaction between light level and objective task difficulty. Planned studies on light level, taken together with my current work on color temperature on light, will compose a comprehensive understanding about influences of lighting parameters like spectrum and illuminance on motivation and effort investment. This knowledge will allow further investigations in more applied settings to test the motivating potential of light in settings of fatigue and depression.

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