

Bright logic and creative shots in the dark: Illumination affects thinking styles and cognitive performance

Anna Steidle, Eva-Verena Hanke, & Lioba Werth

Chemnitz University of Technology, Chemnitz, Germany

Light is a fundamental aspect of people's environment. Most evidently, visual perception changes under different lighting conditions: with increasing darkness, vision becomes less focused and less detailed. Drawing on this evolutionary formed link, Steidle, Werth, & Hanke (in press) recently showed that dim lighting conditions trigger a more global style of information processing which predisposes people to pay attention to the whole figure instead of details. Based on these findings this research aims to approach the – still unanswered – question how illumination influences our thinking and cognitive performance. We expected that under dim lighting conditions individuals would adopt a broad and less detailed way of thinking and perform better on cognitive tasks that call for this style of thinking than under bright lighting conditions.

In Study 1, based on Sternberg (1988), we differentiated between a broad, self-determined, legislative and a detailed, rule-oriented, executive way of thinking. After working for one hour either under well-lit (1500 lx), dim (150 lx), or control (500 lx) conditions the preferred thinking styles of one-hundred participants was assessed. As expected, participants in the well-lit room preferred an executive to a legislative style, whereas participants in the dim room preferred a legislative to an executive style. There was no preferred thinking style in the control room.

Different types of cognitive tasks call for different thinking styles: Logical reasoning requires applying well-learned structures - typical for executive thinking, whereas creating something new requires making unusual connections and an expansion of conceptual attention – typical for legislative thinking. In Study 2, sitting in either a well-lit (1500 lx), dim (150 lx), or control (500 lx)

room, 148 participants received logical and creative performance tasks. As expected, in the well-lit room, participant's logical performance was better than their creative performance, whereas in the dim room their logical performance was worse than their creative performance. In the control room participants showed a similar performance in the logical and the creative task.

In two studies, we demonstrate that bright (versus dim) lighting conditions evoke an executive (versus legislative) style of thinking and thus can enhance performance on logical (versus creative) cognitive tasks. This research is in line with grounded cognition approaches (Barsalou, 2008) that explain effects of environmental variables on cognition and behavior via evolutionary determined or learned associations. Previous research explained effects of light on cognition by changes in affect (Hygge & Knez, 2002). However, mood could not explain these results. Hence, our theorizing and findings add a new explanatory mechanism. Moreover, these findings offer important implications for lighting and office design. Depending on their task, individuals should be able to heighten or lower the level of illumination in their office.

References

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