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Thinking through Design is Creative and Inspiring: The Why and How

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The article by Karin Lindgaard and Heico Wesselius[1] sheds new light on the psychology of design by applying theoretical perspectives of metaphor, embodied cognition, and visual thinking to explain why design thinking — or thinking through design — is an embodied process to induce creative solutions. It highlights that human cognition originates, in part, from sensory perception, bodily movement, and physical interaction with the external world. These embodied experiences aid our understanding of abstract concepts, sense making of complex situations, and generation of meaning and insight. Design thinking engages individuals in activities such as sketching or prototyping to make ideas visible and tangible. These strategies naturally embody abstract ideas in concrete artifacts through physically presenting, manipulating, and simulating ideas, thus making it easier to materialize solutions to design problems. Such an embodied process explains why design thinking affords the generation and actualization of creative ideations.

This perspective of applying embodied cognition and metaphor to understand design thinking is enlightening. In this commentary, we would like to add to the discussion in hopes of further enriching both the theory and application. We argue that design thinking is a potent source of inspiration, which is believed to play a critical role in the composition of many creative works and productions to date. To empirically study inspiration, Thrash and Elliot conceptualized the notion of inspiration-to-create as a composite of three core characteristics, namely evocation, transcendence, and approach motivation.[2] Inspiration tends to be a passive state, being evoked by an idea, a person, or a behavior that illuminates possibilities previously unknown. It follows that inspiration has the capability to transcend previously known ideas to better ones, as awareness or reflection of new opportunities comes to light. This resonates well with Lindgaard and Wesselius's argument regarding "the discourse of 'design and designerly thinking as a reflective practice.'"[3] Inspiration is also energizing, giving people an approach motivation to express, materialize, or transmit the transcendent idea being evoked. This matches well with the motivational state in design thinking, which propels the materialization and transmission of creative ideas. Indeed, it is interesting to know that the dictionary definition of inspiration gives a hint of embodiment as an act of breathing in illuminating ideas — "A breathing in or infusion of some idea, purpose, etc. into the mind; the suggestion, awakening, or creation of some feeling or impulse, especially of an exalted kind."[4] In addition, the metaphor of gaining vision is widely used to describe creative inspiration.[5] In this light, we posit

that design thinking serves as a compelling source for inspiration, which is also, in part, an experiential and perceptual process readily evoked through physical sensations and movements.

One defining feature of inspiration is the generation of feelings. Lindgaard and Wesselius surmise that feelings play a fundamental role in the sense of fit in design thinking, where feeling "emerges as the gestalt experience of simulating past relevant situations in the present."[6] The emergence of feelings suggests that design thinking and inspiration are tightly linked. On the one hand, inspiration was found to generate an elevated sense of feelings in inspired people,[7] and presumably these feelings can provide that sense of fit. On the other hand, through embodiment, design thinking gives rise to a feeling of fit, which is likely to coincide with the feelings of connection, openness, clarity, and energy that commonly characterize an inspired state.[8] Therefore, design thinking is inspiring when it produces a felt sense of fit that is likely to be revealing and insightful.

Whilst Lindgaard and Wesselius's article has deepened our understanding of the theoretical basis of why design thinking can lead to greater creativity and inspirational discovery, it is also critical to know how embodied cognition and metaphor can be applied to design thinking in practice. Research has shown that acting out metaphors for creativity can activate cognitive processes that facilitate the generation of new ideas and connections.[9] For example, participants gesturing with the left hand, then the right — vs. with only one hand — during idea presentation to enact the metaphor "on one hand, then on the other hand," or walking freely — vs. sitting or walking along a fixed rectangular path — to enact the metaphor "think outside the box," were found to perform more adeptly in divergent thinking tasks that entail the generation of multiple solutions to a creative problem. Further, participants who were told to physically pull together one object from the left and another object from the right to enact the metaphor "put two and two together" outperformed those who physically pulled objects from the same side in convergent thinking tasks that entail conceptual recombination of distant ideas to come up with creative solutions. In another example, research has shown that embodiment through eye movements helped participants solve the classic Duncker's radiation problem.[10] This creative insight problem asks "Given a human being with an inoperable stomach tumor, and lasers which destroy organic tissue at sufficient intensity, how can one cure the person with these lasers and, at the same time, avoid harming the healthy tissue that surrounds the tumor?"[11] The correct solution involves firing multiple, low-intensity laser beams from different locations to target at the tumor. Studies found that when participants were provided embodied guidance, with their eye movement trajectories being directed to move in a pattern related to the solution of the problem — in other words, making in-and-out eye movements crossing from outside the body towards the internal tumor on the diagram — they were more likely to successfully solve the problem relative to those who moved their eyes in unrelated patterns.[12] This example also demonstrates visual thinking, a design thinking strategy discussed by Lindgaard and Wesselius, which aids visual-spatial understanding.

These findings suggest that bodily movement, physical interaction with artifacts, and enactment of metaphors can be practiced during the design process to bring about creative benefits, thus transiting from the stage of "seeing as" to "seeing that"[13] as discussed by Lindgaard and Wesselius in their article. Different embodiment strategies could be applied during different design stages to facilitate creativity. For instance, at the idea generation stage, conducting open-ended user interviews in a large and open space as opposed to a confined room or narrow cubicle could be highly conducive to contemplation. The current practice is to conduct third-person observation when collecting user experience data either during the initial user study stage or the prototype testing stage. However, it would be helpful if designers could personally embody the role of a target user to encounter the design interface and experience feelings first-hand. In a team setting where groups generate design ideas collectively, participants could be encouraged to move freely in an open space to brainstorm ideas and work on their sketches or prototypes in a non-restricted manner. When the team is ready to reconvene for idea combination or selection of the final solution, members could present their design ideas by means of tangible artifacts instead of showing them on a computer. They could place these ideas in a central place next to each other, so that ideas can be freely manipulated, played with, torn apart, recombined, analogized, and so on. These strategies afford actual simulation of bodily experiences, visual thinking, and a sense of fit, experiences that could be harnessed to foster further creativity and inspiration in design thinking.

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4   *Oxford English Dictionary*, 2nd ed. (1989), s.v. "inspiration."

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The Need for New Methods to Study Embodied Designing

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Design studies has inherited much from the cognitive sciences. Karin Lindgaard and Heico Weselius's article "Once More, with Feeling"[1] posits that an ongoing debate in cognitive science on the embodied nature of cognition should now also find its way into design research to inform how we theorize and research design thinking.

Research on embodied cognition is interested in the ways the body, brain, and environment interact inseparably and dynamically to give rise to intelligent behavior.[2] Lawrence W. Barsalou has specifically advocated an understanding where neurally-based simulations in modality-specific representations, situated and embedded in behavioral contexts, underlie our ability to plan actions and coordinate activities.[3] His theorizing predicts that modality-specific information is activated during cognitive tasks, plays functional roles, and is situated—predictions that do not flow naturally from cognitivist theories. But embodied cognition is not a coherent theory—the various strands of embodied cognition research are defined mainly by the hypotheses that researchers pursue rather than a coherent theoretical framework.[4]

Given that designing is one notable form of intelligent behavior, it would seem obvious that design research could well become informed by utilizing findings and theories from embodied cognition, as suggested by Lindgaard and Wesselius.[5] However, it is not quite clear to me which theories in design or design thinking the authors are targeting. While the embodied cognition critique in cognitive science has set out to refute traditional cognitivist approaches that assume the existence of cognitive amodal symbols and distinct stages of processing—assumptions that also exist in some design theories—a reading of the target article left me uncertain which of the design research classics were supposed to be the recipients of the embodied attack? In part, the issue may be that the scope of the article may be too broad—encompassing, as it does, metaphor, feeling, and embodied cognition—and that each part appears to address somewhat distinct issues in cognition and design research. While cognitivist attempts at conceptualizing thinking in abstract terms—as representations—were the mainstream in cognitive science for a while in the 1950s and 1960s, theorizing on the designerly way of thinking has not left the designed object behind to the same degree, frequently maintaining interactionist and embodied perspectives throughout the history of design research. Indeed, the embodied criticism is perhaps not as new as suggested by Lindgaard and Wesellius. In the 1990s, for example, Vinod Goel[6] championed a relatively similar critique of cognitivist theories in his writings on sketching behavior in design. Goel's work illustrated how far cognitivist science falls short of capturing the richness of thinking implied in design sketches. Sketching has served as one case-in-point where it is