

Studying design fixation with a computer game

Maria Adriana Neroni, Luis A. Vasconcelos, Nathan Crilly
{man52, lal40, nc266}@cam.ac.uk

University of Cambridge, Engineering Design Centre, Cambridge, UK

Design Fixation is a phenomenon where designers unknowingly limit the space within which they search for solutions (Jansson & Smith, 1991). That is, they become ‘blinded’ to solutions other than the ones they are considering. This can be a problem in professional practice (Crilly, 2015), and also in educational settings (Chrysikou & Weisberg, 2005).

Empirical research into design fixation has typically involved experimental studies that intentionally induce fixation by exposing designers to stimuli that might limit their thoughts. Participants are set a design task in which a problem is posed and an example solution is provided to some of the participants. What is often observed is that the exposure to example solutions is associated with a reduction in the variety, quantity and quality of solutions that designers generate in response to the design task (for a review, see Vasconcelos & Crilly, 2016).

The established research methods that are used to study design fixation suffer from a number of weaknesses, including limited data collection and highly subjective analysis. To address this, we propose using an adapted computer-based version of the experimental paradigm originally used to study process fixation, also called Mental Set or the *Einstellung* Effect (Luchins, 1942). This will permit better data capture, a more objective analysis of design behaviour and also allow us to connect design fixation research to a broader set of psychological studies.

The computer-based task will consist of a simple game-like design activity. For example, the current task being developed uses a game that requires participants to design and test a simple bridge. The overall purpose of the game is to design a bridge across a river that can support the specified load without exceeding the specified budget (see Figure 1).

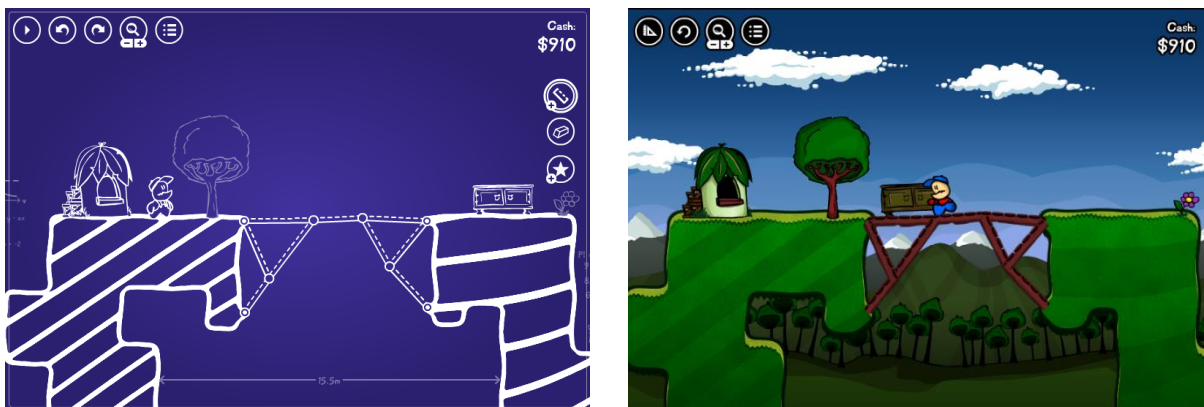


Figure 1. Example of a computer-based game that can be used to study the design process (Cargo Bridge 2, n.d.)

Following the traditional experimental paradigm targeting the *Einstellung* Effect, the task will consist of three sets of trials which vary in the type of design method that can be used to construct the bridge. Specifically, in the “*Einstellung* trials” the bridge can only be constructed by using the one particular complex design method. In the “critical trials” the bridge can be constructed using the previously learnt complex design method or a simpler and faster method. In the “extinction trials” the bridge can be only constructed with the easier and faster method. It is expected that, when working on the critical and the extinction trials after working in the *Einstellung* trials, participants will fail (and/or take more time) to notice the easier and faster design method and will continue constructing the bridge by using the more complex method they successfully used to solve the *Einstellung* trials.

Using a computer-based task for fixation experiments promises a number of methodological advantages over traditional design fixation studies. There are limitations too however, and there are challenges in designing tasks that are adequately controlled and yet flexible enough to permit creative design work to be performed. We look forward to reporting the results of our methodological enquiries and to conducting further fixation research once the methods are refined.

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