The Cost of Violating Design Affordances and Conventions

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Constraints during the design process may lead to products with arbitrary mappings of actions to functions. However, when multiple products have similar mappings, users may develop an expectancy that an action will accomplish a function. For example, users may expect underlined items on a web page to be clickable hyperlinks. Such learned expectancies are conventions (Norman, 1999).

There is a debate about whether designers need to distinguish between perceptual affordances and learned conventions (McGrenere & Ho, 2000; Norman, 1999). Because there is little behavioral evidence for either side of the debate (see Still & Dark, 2008), we investigated the impact of working memory load and mapping congruency on affordances and conventions.
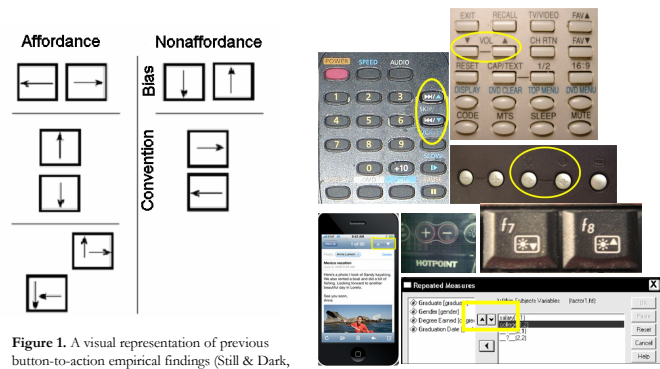

Figure 1. A visual representation of previous button-to-action empirical findings (Still & Dark, 2008). The squares reflect buttons and the arrows directional response.

Figure 2. Examples of button-to-action mappings on different interfaces.

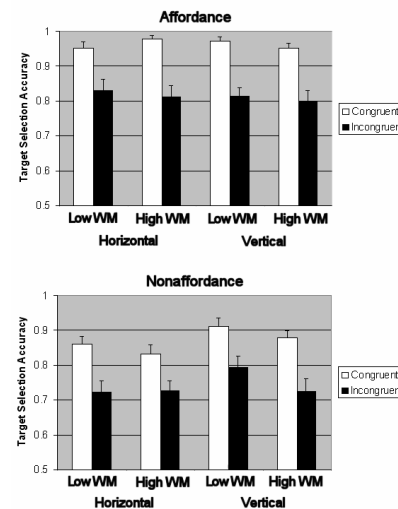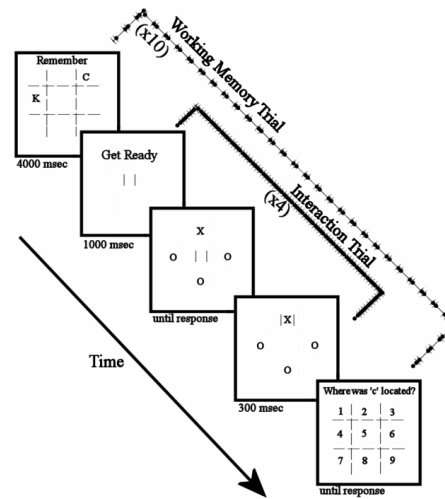For more information visit: JeremiahStill.info

Figure 3. This figure represents a four way interaction, $F(1, 26) = 4.81$, $p = .04$, between interaction type, button configuration, working memory load and mapping congruency. The error bars show the mean standard error.

Our findings suggest that both sides of the debate are correct. There was a behavioral difference between acting on affordances and acting on conventions, but learned conventions influenced responses towards expected actions. Further, conditions requiring violation of an expected response, whether based on an affordance or a convention, were associated with poorer performance. We believe that after the initial learning period, conventions play a critical role in the perception of a design's available actions, just as do perceptual affordances.

Three Takeaways for Designers:

1. Perceptual affordances ought to be used when possible.

2. Violating a learned convention is just as costly as violating a perceptual affordance.

3. If implementing a perceptual affordance is not feasible, established conventions should be reused.

References

McGrenere, J., & Ho, W. (2000). Affordances: Clarifying and evolving a concept. *Proceedings of Graphics Interface*, 1-8.

Norman, D. A. (1999, May). Affordance, conventions, and design. *Interactions*, 38-42.

Still, J. D., & Dark, V. J. (2008). An empirical investigation of affordances and conventions. *Proceedings of the Third International Conference on Design Computing and Cognition*, 457-472.