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When “Arbitrary” Decisions Aren’t Arbitrary: Conventions and Design

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Natural physical constraints are called affordances, while more arbitrary constraints that develop within a population are called conventions (Norman, 1999). When an affordance is present, the designer and user are likely to view the situation in the same way. When an affordance is not present, the designer needs to consider the possibility that a convention exists.

We assessed (Still & Dark, in press) how users would respond to four directional cues (up, down, left, right) when responses were constrained to two buttons. The spatial layout of the buttons was such that each pair "afforded" a response that matched either 2 or 4 of the directions.

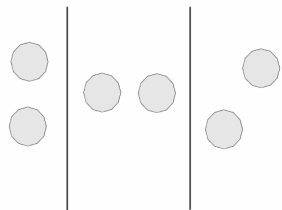
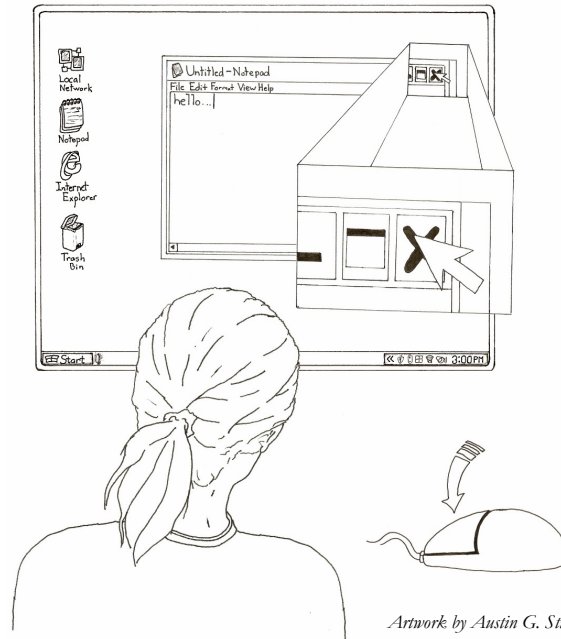


Figure 1. Each panel represents one of the two-button configurations used in the current research.



Figure 2. Examples of input devices.



Artwork by Austin G. Still

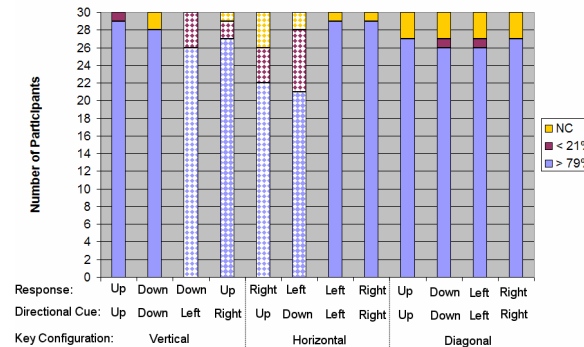


Figure 3. Distribution of individuals falling into each of the three consistency categories as a function of each combination of button configuration, cue, and response. Solid bars represent affordance conditions and patterned bars represent nonaffordance conditions.

Our results suggested that perceptual affordances existed when the spatial button configuration was congruent with the directional cues. However, even when no perceptual affordance was present, participants demonstrated consistent button-to-action mapping. The consistency was very strong for the vertical keys, suggesting the existence of a convention. Thus, from a design standpoint, although the decision to represent four directions with either a horizontal or vertical key configuration would seem to be arbitrary, one choice may better fit the user's biases.

Three Major Reasons Why Recognizing the User's Current Conventions is Important:

1. Learning a new interface convention consumes working memory resources
2. Working memory resources may not be available in all situations (e.g., under stress)
3. Taking advantage of knowledge stored in long-term memory allows more effortless interface interaction

References

- Norman, D. A. (1999, May). Affordance, conventions, and design. *Interactions*, 38-42.
- Still, J. D., & Dark, V. J. (in press). An empirical investigation of affordances and conventions. *Proceedings of the Third International Conference on Design Computing and Cognition*.