

Stefano Gualeni
Marcello A. Gómez Maureira

Self-Transformative effects of designing videogames ...

Do videogame designers undergo personal transformations when designing games that are meant to stimulate psychological changes?
... maybe!

We attempted to answer this question through a case study, but found that our research could not provide an answer. It does, however, provide important insights for further studies into the self-transformative effects of designing videogames.

... and the challenge of capturing them quantitatively A Case Study

Existing work on the benefits of designing games often focuses on educational advantages. Videogame design is leveraged to experientially engage with learning mathematics, logics, and computer programming [3–5]. With the objective of exploring personal and psychological transformations we base our work on the reflexive effects emerging from the process of designing [6, 7].

Stefano Gualeni argues that **when taking part in design processes that are meant to be transformative for the recipients of the designed object, designers also undergo psychological transformations** [2].

In this study, we attempt to explore this hypothesis with quantitative methods.



Screenshots from two of the games developed by the participant-designers

Experiments and Results

We conducted two experiments over two academic years with groups of M.Sc. students taking a 'Videogame Development' course.

Over a five-month period, they were tasked with developing videogames designed to lessen the implicit attitudes towards sugary and fatty food in players. We used the Implicit-Attitude Test (IAT) as quantitative measure [1] in both experiments, and the Fat-Related Diet Habits Questionnaire (FRDH) in the second.

FIRST EXPERIMENT:

Students developed small, transformative videogames on an individual basis. Measures were taken at the beginning and the end of the design process.



IAT Results of the first experiment

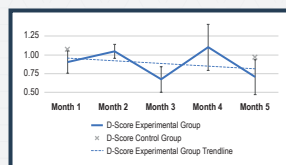
We found that the D-Score (indicating implicit attitude in the IAT) increased from **0.64** before the design process to **0.92** after; an increase in positive association for healthy food. The control group (two students) showed a decrease, going from **1.22** to **1.13**. With $BF_0 = 3.9$ (Bayesian Paired Samples T-Test), we found evidence for positive implicit association strengthening throughout the design process.

SECOND EXPERIMENT:

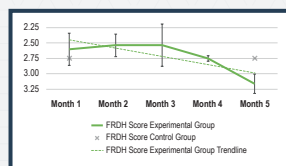
Students were tasked to develop videogames in teams of three members each. We increased the frequency of the IAT and included the FRDH.

The D-Score of the IAT went from **0.91** to **0.70**. Participants had decreased their positive implicit association for healthy food. The control group (four students) went from **1.07** to **0.97**. With $BF_0 = 0.2$, there is evidence that the practice of designing a videogame did not positively impact the implicit association of the participants.

The results of the FRDH questionnaire follow this trend, with the score going from **2.60** to **3.20** (higher indicates a higher involvement of fat in dietary habits). With $BF_0 = 0.2$, we have to conclude that the hypothesized lowering of the score did not occur.



IAT Results of the second experiment



FRDH Results of the second experiment

Problems and Discussion

Initially, we argued that running an experiment on a group of students who were taking a videogame development class would fit our research goals. Observing a group of people of roughly the same age and educational background in videogame design should remove some external factors. However, this invited several other factors:

Problems with the Educational Setting: Stress ensuing from having to design and develop a videogame on top of studying for other courses influenced any potential transformation that might or might not have emerged

Disconnection by Design: Participants reflected on their understanding of the healthy and unhealthy food items in their videogames, and reported relating to them functionally as 'game components' (thus potentially limiting their transformative effects)

Lack of Engagement with the Audience: Participants designed their transformative videogames in a way that was not directly informed by the cognitive needs of their intended players (a form of engagement that might have influenced the designers' own disposition towards sugary and fatty foods)

The Duration of the Experiments: The five-month 'Videogame development' course taken by our participants spanned over three seasons, which entailed physiological seasonal changes in relation to food intake and metabolism that were not accounted for.

Conclusion

Our experiments suggest that the beginning of the videogame development process (involving tasks such as gathering information, developing concepts, and early prototyping) has a higher chance of triggering transformations in the videogame designers than later phases, which are characterized by production tasks that are less exploratory.

Complementing quantitative approaches, we believe that qualitative indications coming from more elaborate interviews and diary entries could provide a more complete understanding of videogame design as a practice of self-transformation.

Finally, we speculate that dietary habits might be an ill-suited proxy-measure for evaluating transformation in students.

References

- [1] Anthony G. Greenwald, Debbie E. McGhee, and Jordan L.K. Schwartz. 1998. Measuring individual differences in implicit cognition: the implicit association test. *Journal of personality and social psychology* 74, 6 (1998), 1464.
- [2] Stefano Gualeni. 2015. Self-transformation through Game Design. In *Philosophy of Computer Games conference, BTK University of Art and Design, Berlin, Germany*.
- [3] Elisabeth R. Hayes and Ivan Alex Games. 2008. Making computer games and design thinking: A review of current software and strategies. *Games and Culture* 3, 3-4 (2008), 309–332.
- [4] Y.B. Kafai, M.L. Franke, C.C. Ching, and J.C. Shih. 1998. Game design as an interactive learning environment for fostering students' and teachers' mathematical inquiry. *International Journal of Computers for Mathematical Learning* 3, 2 (1998), 149–184.
- [5] Yasmin B. Kafai. 1995. *Minds in play: Computer game design as a context for children's learning*. Lawrence Erlbaum Associates, Inc.
- [6] Donald A. Schon. 1983. *The reflective practitioner: how professionals think in action*. Basic Books New York.
- [7] Phoebe Sengers, Kirsten Boehner, Shay David, and Joseph Kaye. 2005. Reflective design. In *Proceedings of the 4th decennial conference on Critical computing: between sense and sensibility*. ACM, 49–58.