

Critical Review: Improving the Efficacy of Games for Change Using Personalization Models

Persuasion is the act of influencing or reinforcing certain attitudes and behaviours [Khaled et al., 2008]. The use of technology for encouraging behavioural change to benefit its users or the wider community is a long-term area of research [Fogg, 2002]. This review will present a summary and critical analysis of Orji et al. [2017] whose paper explores the use of personalisation models as a persuasive device for improving the efficacy of games which are designed to change user behaviour, as well as putting forward a set of suggestions for future work in this domain of Persuasive Technology.

Summary of Contributions

Orji et al. [2017] highlight the rising prominence of *games for change*¹ that are designed for purposes other than entertainment, to effectively educate players about certain topics in a way that influences their behaviour [Busch et al., 2015]. The authors raise the issue that many such games are designed with a “*one size fits all*” philosophy whereby the design of the game itself (and its adopted persuasive *strategies*) are not tailored to the *type* of the player. Orji et al. [2017] therefore seek to answer two main research questions to understand the observed efficacy of certain strategies in existing games [Peng, 2009, Kaipainen et al., 2012]. Firstly, whether tailoring games for change to a specific player type increases their persuasiveness. Secondly, if beneficial effects of tailoring are observed, whether these effects are mediated by an improved play experience. If these could be answered, results could inform the future decisions of games designers in which persuasive strategies they adopt to maximise efficacy in certain player types.

Initial work by the authors indicated that a strategy shown as effective for one type of user could indeed be detrimental to another [Orji et al., 2013] (Table 1). This table sets out a well-founded taxonomy which maps gamer types defined by the BrainHex model of Nacke et al. [2014] (Achiever, Conqueror, Daredevil, Mastermind, Seeker, Socializer and Survivor) against commonly adopted persuasive strategies selected by Gerling et al. [2014] based on a large-scale online survey of gamers.

¹An annual festival exists for workshops and design classes on games for change: www.gamesforchange.org

Table 1: β values confusion matrix: Strength of motivation of different players that result from different strategies. Positive β values indicate that gamers of this type are motivated by the corresponding given strategy. Negative β values indicate demotivation, whilst an empty value indicates neither motivation nor demotivation.

| Strategies Gamer type | CMPT/ CMPR | COOP | CUST | PERS | PRAS | SEMT/ SUGG | SIML | REWD |
|--------------------------|---------------|------|------|------|------|---------------|------|------|
| Achiever | - | .15 | - | - | - | .10 | - | .10 |
| Conqueror | .25 | - | - | .12 | - | .12 | .14 | - |
| Daredevil | -.10 | - | - | - | - | -.14 | .11 | - |
| Mastermind | .12 | - | .10 | .12 | - | .14 | .12 | - |
| Seeker | .10 | - | .19 | .11 | .10 | - | - | - |
| Socializer | .11 | .17 | -.12 | - | -.12 | -.13 | - | - |
| Survivor | .17 | -.20 | -.13 | - | - | .27 | - | -.14 |

CMPT/CMPR = competition and comparison, COOP = cooperation, CUST = customization, PERS = personalization, PRAS = praise, SEMT/SUGG = self-monitoring and suggestion, SIML = simulation, REWD = reward.

Whilst ..., the data collected from authors' earlier experiments is corroborated by other existing work - treating user groups in a monolithic way is generally considered dangerous, especially in the domain of games for health [Berkovsky et al., 2010].

To evaluate their research questions, Orji et al. implemented two versions of a custom a game called *Junk Food Aliens* (Figure 1). The reward-based version (JFA-R) adopted persuasive strategies such as achievement badges (Figure 3) whereas the competition-based version (JFA-C) adopted comparative strategies such as leaderboards (Figure 2).

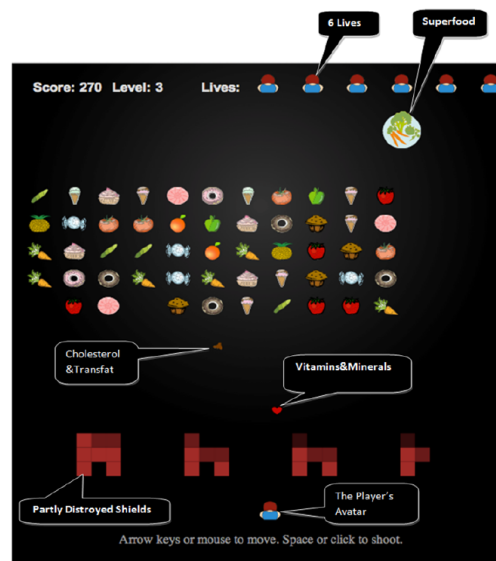


Figure 1: “Junk Food Aliens” (JFA): A persuasive game designed to change gamer behaviour towards healthy eating.

| Level 4 Game Performance Leaderboard | | |
|---|-------------|-------|
| Rank | Player Name | Score |
| 1st | Jean | 950 |
| 2nd | Charles | 886 |
| 3rd | June | 785 |
| 4th | Rita | 557 |
| 5th | Heather | 531 |

Figure 2: JFA-C: Competition-based version of JFA.

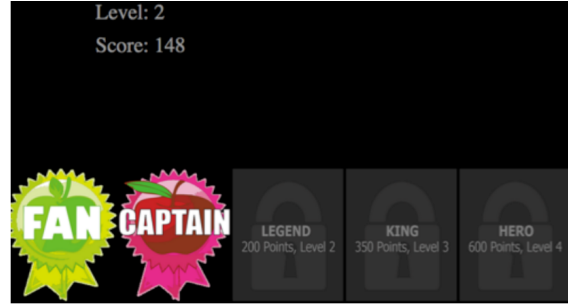
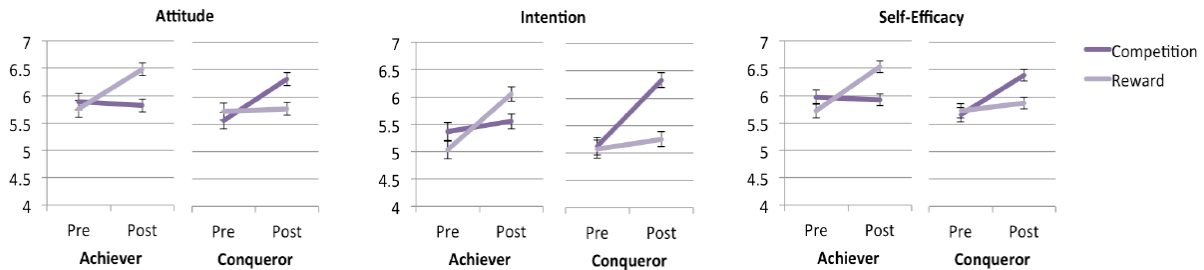


Figure 3: JFA-R: Reward-based version of JFA.

Main contributions of Orji et al. [2017] are therefore fourfold. First, it is important to tailor games for change in order to observe any efficacy as the main experiment demonstrates by measure of change in attitude, self-efficacy, and intention. Second, tailoring can be achieved by modifying the persuasive strategies adopted, rather than the mechanics of the game which will surely minimise the tailoring costs involved. Thirdly, the resulting positive effect of tailoring was not seen to be mediated purely by an improved player experience which, if it remained untested, would be a very strong potential confounding factor. Finally, the adoption of a single persuasive strategy is sufficient to observe these effects - combining additional strategies is unpredictable and may be somewhat counter-productive.

Justifications for Conclusions

Figure 4: Mean values \pm SE for Attitude, Intention, and Self-Efficacy by Gamer type (Achiever, Conqueror) and Game version (Competition, Reward).

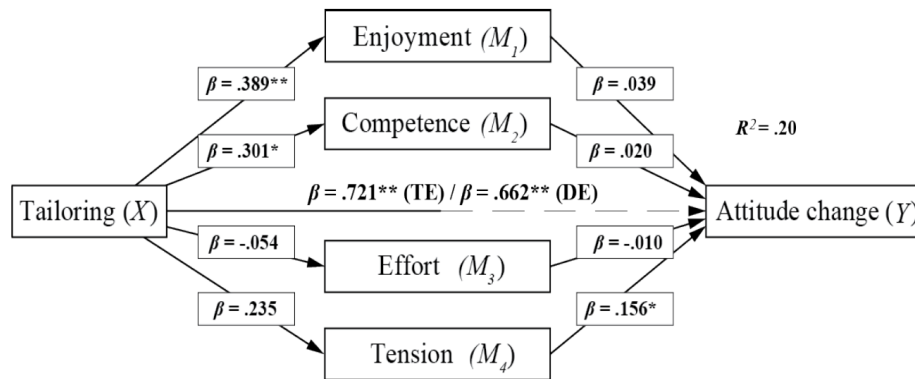


Figure 5: Parallel mediation model of tailoring on attitude change with play experience as mediator.

Limitations and Suggested Further Work

Conclusion

Word count: 0 words

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