

Gender and Persuasive Technology: Examining the Persuasiveness of Persuasive Strategies by Gender Groups

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Abstract. This paper examines the persuasiveness of ten commonly used Persuasive Technology (PT) strategies with respect to the effect of gender. The results of a large-scale study suggest that males and females differ significantly in persuadability – with females being more receptive to most of the PT strategies. Some PT strategies are more suitable for persuading one gender than the other.

Contribution statement. This paper contributes to research on ways of tailoring Persuasive Technology to various user groups. It also contributes to research on validating and comparing the effectiveness of various persuasive strategies as applied in Persuasive Technology design.

Keywords: Persuasive Technology, Behavior Change, Gender, Persuasive Strategies, Persuasiveness, Health Behavior, PSD, health intervention, mhealth, health.

1 Introduction

Research has shown that tailoring PT interventions can increase their effectiveness in the domain of health [5]. As a result, several research efforts have been focused on different methods of tailoring PT interventions [4, 5, 7, 8], including personalizing the strategies employed. According to Berkovsky et al. [1], tailoring persuasive strategies has a “huge untapped potential to maximize the impact of persuasive applications”; however, research into tailoring PT strategies is just beginning. In choosing approaches for group-based tailoring, research has shown that gender is a reliable approach [8].

Therefore, this paper investigates how persuasive technologies for health can be tailored according to gender. We achieve this by comparing the effectiveness of ten PT strategies – *competition, comparison, cooperation, customization, personalization, praise, simulation, Self-monitoring* and *Feedback, suggestion, and reward* (from Fogg [3] and Oinas-Kukkonen [6]) – within and across the gender groups. The results of a large-scale study of 1108 participants suggest that males and females differ significantly in persuadability – with females being more receptive to most of the PT strategies.

2 Study Design, Methods, and Results

To collect data for our model, we follow the approach described by Halko and Kientz [4]. Specifically, we represented each persuasive strategy in a storyboard. The storyboards show a character and his/her interactions with a persuasive application for promoting healthy eating. The ten storyboards were drawn by an artist and were based on storyboard design guidelines by Truong et al. [9]. Figure 1 shows examples of one of the ten used persuasive strategies, *personalization*. To elicit feedback on the persuasiveness of the strategies, each storyboard was followed by a validated scale for measuring perceived persuasiveness, adapted from Drozd et al. [2]. The questions were measured using participant agreement with a 7-point Likert scale ranging from “1 = Strongly disagree” to “7 = Strongly agree”.

We recruited participants for this study using Amazon’s Mechanical Turk (AMT). A total of 1384 participants responded to our study. A total of 1108 valid responses – 575(52%) males and 533(48%) females – were retained and included in the analysis. To ensure that participants understood the intended persuasive strategy in each of the storyboards, we ran chi-squared tests on the participants’ responses to the multiple-choice questions that required them to identify the represented persuasive strategy for each of the storyboards. The results for all the strategies were significant at $p < .001$. We determined the consistency of the scale using Cronbach’s alpha (α). The α for the strategies were all greater than 0.70 showing that the scales have good internal consistency. To determine whether responses to each strategy were unique in our data, we performed Exploratory Factor Analysis (EFA), which showed that self-monitoring and suggestion loaded into one factor and competition and comparison loaded into one factor as well. Hence, the total number of factors examined in this study was reduced from ten to eight. Next, we examine the effect of gender on the persuasiveness of the various PT strategies using RM-ANOVA in SPSS 21. The analysis was performed after validating our data for ANOVA assumptions, with no violations. When the sphericity assumption was violated, we used the Greenhouse-Geisser method of correcting the degrees of freedom. Pairwise comparison used the Bonferonni method of adjusting for multiple comparisons.

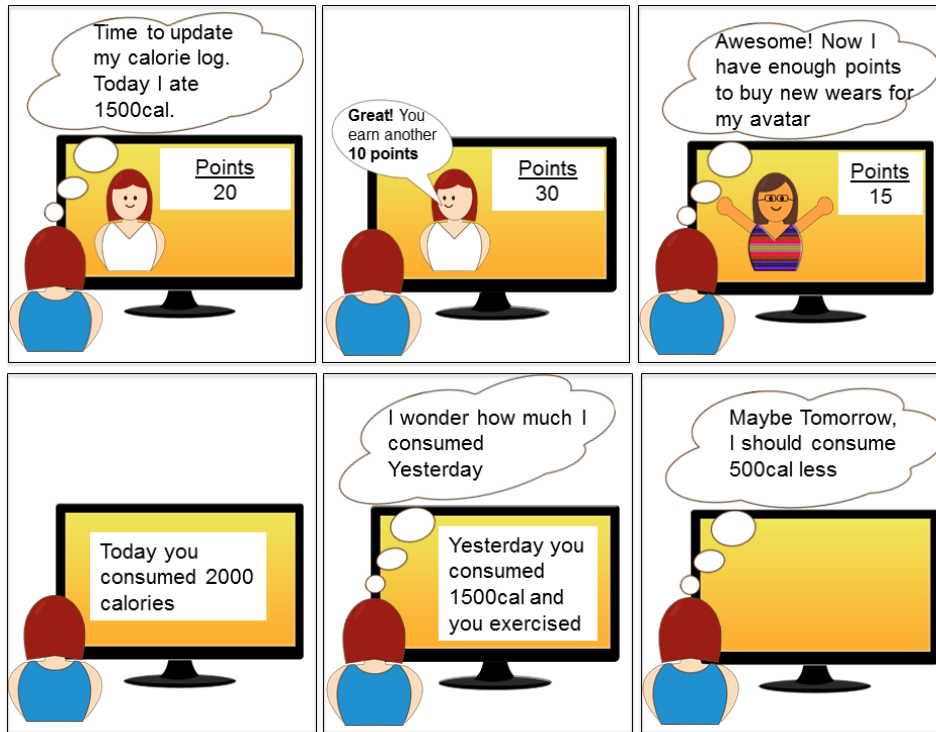


Fig. 1: Storyboard illustrating reward and self-monitoring strategy

Our results show significant main effects of strategy ($F_{6.05,6687.58}=184.718$, $p \approx .000$, $\eta^2=.143$) and gender ($F_{1,1106}= 5.331$, $p \approx .021$, $\eta^2=.005$) on persuasiveness (see Table 1). Overall, females rated the strategies as more persuasive than men, however; there was also a significant strategy by gender interaction on persuasiveness ($F_{6.05,6687.58}=4.463$, $p \approx .000$, $\eta^2=.004$). Pairwise comparisons show that females found five out of the eight strategies significantly more persuasive than males: personalization ($F_{1,1106}=13.153$, $p \approx .000$, $\eta^2=.012$); simulation ($F_{1,1106}=9.831$, $p \approx .002$, $\eta^2=.009$); cooperation ($F_{1,1106}=4.418$, $p \approx .036$, $\eta^2=.004$); customization ($F_{1,1106}=4.386$, $p \approx .036$, $\eta^2=.040$); and praise ($F_{1,1106}=4.428$, $p \approx .036$, $\eta^2=.004$).

Strategies	CMPT/ CMPR	COOP	CUST	PERS	PRAS	SEMT/ SUGG	SIML	REWD
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)
Males	4.45 (1.68)	4.30 (1.73)	3.24 (1.79)	4.67 (1.68)	4.10 (1.75)	4.27 (1.58)	4.46 (1.73)	3.82 (1.79)
Females	4.35 (1.76)	4.52 (1.79)	3.46 (1.71)	5.02 (1.57)	4.33 (1.74)	4.36 (1.59)	4.78 (1.70)	4.00 (1.84)

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

Table 1: Mean and Standard Deviations (SD) for the strategies by gender. Bolded means are significantly different across males and females.; $p < .05$.

3 Conclusion

Males and females differ with regard to their perceived persuasiveness of five out of the eight strategies examined in this paper. Surprisingly, females perceive five strategies: cooperation, customization, personalization, praise, and simulation as being more persuasive than males. This implies that females can be more easily persuaded using these strategies. It also suggests that females are more persuadable than men with respect to the influence of the strategies on their behavior.

In general, regardless of gender, personalization and simulation emerged as the most persuasive (significantly different from all other strategies), whereas reward and customization were the least persuasive (also significantly different from all others). The rest of the strategies were in the middle with competition/comparison and cooperation leading the group.

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