Gender, Age, and Responsiveness to Cialdini's Persuasion Strategies

Rita Orji(✉), Regan L. Mandryk, and Julita Vassileva

Computer Science Department,
University of Saskatchewan,
Saskatoon, SK. S7N 5C9, Canada
rita.orji@usask.ca, {regan,jiv}@cs.usask.ca

Abstract. Research has shown that there are differences in how males and females respond to persuasive attempts. This paper examines the persuasiveness of the six persuasive strategies - *Reciprocity, Scarcity, Authority, Commitment* and *Consistency, Consensus* and *Liking* developed by Cialdini with respect to age and gender. The results of the large-scale study (N = 1108) show that males and females differ significantly in their responsiveness to the strategies. Overall, females are more responsive to most of the strategies than males and some strategies are more suitable for persuading one gender than the other. The results of our study also reveal some differences between younger adults and adults with respect to the persuasiveness of the strategies. Finally, the results show that irrespective of gender and age, there are significant differences between the strategies regarding their perceived persuasiveness overall, shedding light on the comparative effectiveness of the strategies.

Keywords: Persuasive technology · Behavior change · Gender · Age · Persuasive strategies · Persuasiveness · Individual differences · Susceptibility

1 Introduction

Persuasive Technology (PT) is a term used to define a class of technologies that are intentionally designed to change people's attitude or behavior [1] using various strategies. In the last few decades, the attention of PT researchers has focused on developing technologies and strategies to influence people's behaviors. As a result, several persuasive strategies have been developed that could be employed to motivate desired behavior change [1–3]. However, people differ in how they are motivated; a strategy that motivates one type of person to change her behavior may actually deter behavior change for another type of person [4, 5]. It is only recently that researchers have started to investigate how various users' characteristics and individual differences mediate the persuasiveness of the strategies and hence the need to tailor the strategies to increase their effectiveness [4–7].

In choosing approaches for group-based tailoring, research has shown that gender is a reliable characteristic [8]. Research has also established gender and age differences in many areas including the perception of different behavioral determinants [9],

T. MacTavish and S. Basapur (Eds.): PERSUASIVE 2015, LNCS 9072, pp. 147–159, 2015.
DOI: 10.1007/978-3-319-20306-5_14

gameplay, and health behavior [5, 10]. However, the effect of gender and age on the persuasiveness of the six strategies highlighted by Cialdini [3] have not been explored quantitatively.

In this paper, we investigate how the responsiveness to Cialdini's six persuasive strategies varies by gender and by age group (younger adults and adults). To achieve this, we conduct a large-scale study involving 1108 participants where we investigated the perceived persuasiveness of the six strategies - *Reciprocity, Scarcity, Authority, Commitment* and *Consistency, Consensus* and *Liking* – developed by Cialdini [3]. We adopted the Susceptibility to Persuasion Scale (STPS) developed by Kaptein et al. [4]. The results of our study show that males and females differ significantly in persuadability – with females being more responsive to most of the strategies. The results also reveal some significant differences between the age groups. Finally, the study provides a quantitative validation of the persuasiveness of the strategies overall. Irrespective of gender and age groups, there was significant variability in the perceived persuasiveness of the six strategies.

Our three main contributions are: first, we conducted a large-scale quantitative study to validate the six persuasive strategies developed by Cialdini. Second, we established that there are gender differences in the perceived persuasiveness of the strategies. Third, we show that age influences the persuasiveness the strategies.

2 Background

Persuasive strategies are techniques that can be employed in PTs to motivate behavior and/or attitude change. Over the years, a number of strategies for persuading people to perform the desired behavior have been developed. For example, Fogg [1] developed seven persuasive tools, and Oinas-Kukkonen [2] built on Fogg's strategies to develop 28 persuasive system design principles.

The six persuasive strategies developed by Cialdini – *Reciprocity, Scarcity, Authority, Commitment* and *Consistency, Consensus* and *Liking* – are among the oldest and most widely employed strategies [3]. The six strategies are:

1. **Reciprocity:** People by their nature feel obliged to return a favor and to pay back others. Thus when a persuasive request is made by a person the receiver feels indebted to, the receiver is more inclined to adhere to the request [11].
2. **Scarcity:** People tend to place more value on things that are in short supply. This is due to the popular belief that less available options are of higher quality.
3. **Authority:** People defer to experts [3]. Therefore, individuals are more likely to comply with a request when it is made by a person or people they perceived as possessing high levels of knowledge, wisdom, or power [12].
4. **Commitment and Consistency**: People by their nature strive to be consistent with previous or reported behavior to avoid cognitive dissonance.
5. **Liking:** People can be easily influenced or persuaded by someone they like. Factors such as: similarity, praise, and attractiveness can reliably increase the effectiveness of the liking strategy [3].
6. **Consensus:** We often observe the behaviors of others to help us make decisions. This is because "a large majority of individuals are imitators rather than initiators,

and therefore make decisions only after observing the behaviors and consequences on those around them [12]."

In summary, empirical evidence shows that people differ in their general responsiveness to persuasive appeals as well as in their response to certain persuasive strategies [4–6, 8, 13, 14]. Studies have shown that applying inappropriate strategies may be counterproductive – resulting not only to refusal to comply to persuasive attempts, but even leading to adverse changes in behavior [4, 5]. Responsiveness to persuasive strategies can be predicted on the basis of demographic characteristics and personality traits [8, 14]. On that same note, Cialdini et al. [15] showed that the commitment and consistency strategy is only effective for individuals that have a high Preference for Consistency (PFC). Hence, there is need to investigate for other factors that may influence the effectiveness of the strategies.

3 Study Design and Methods

The data reported in this paper is part of a project aimed at investigating the effectiveness of persuasive strategies for various user groups and hence, develop guidelines for tailoring PTs to increase their effectiveness.

To achieve this, in this paper we adopt the well-established strategies (*reciprocity, scarcity, authority, commitment and consistency, and liking*) developed by Cialdini [3]. We focus on these strategies because they are simple and widely applicable both in technology-mediated persuasion and in human-mediated persuasion.

3.1 Measurement Instrument

To collect data for our study, we adapted the Susceptibility to Persuasive Strategies Scale (STPS) developed by Kaptein et al. [4, 13]. The items were used to assess participants' responsivess to Cialdini's six persuasive strategies. The questions were measured using participant agreement with a 7-point Likert scale ranging from "1 = Strongly disagree" to "7 = Strongly agree". The STPS scale has been shown to adequately predict participant susceptibility to individual strategies and the efficacy of the strategies for motivating behavior change in real life in various domains [4, 13]. We also included questions for assessing participants' demographic information (such as age, gender, geographical territory). Furthermore, we employed attention questions to ensure that participants were actively considering their answers.

3.2 Participants

We recruited participants for this study using Amazon's Mechanical Turk (AMT). AMT has become an accepted method of gathering users' responses [16]. It allows access to a global audience, ensures efficient survey distribution, and high quality results [16, 17]. We followed the recommendations for performing effective studies on the AMT by Mason and Suri [16] and before the main study, we conducted pilot studies to test the validity of our study instruments.

We collected a total of 1,384 responses and retained a total of 1,108 valid responses, which were included in our analysis. Incomplete responses and responses from participants who got the attention questions incorrect were discarded Demographic information is shown in Table 1.

Table 1. Participants' demographic information

N = 1108	
Gender	Females (533, 48%), Males (575, 52%).
Age	18-25 (418, 38%), 26-35 (406, 37%), Over 35 (284, 25%).
Education	Less than High School (12, 1%), High School Graduate (387, 35%), College Diploma (147, 13%), Bachelor's Degree (393, 35%), Master's Degree (141, 13%).
Country	Canada (40, 4%), India (148, 13%), Italy (23, 2%), United States (714,64%), United Kingdom (38, 3%), others (145, 13%)

4 Data Analyses

The goals of this paper are to determine whether significant differences exist between males and females and between younger adults (18-25) and adults (Over 35) with respect to the perceived persuasiveness of the strategies and to compare the persuasiveness of the strategies overall. Below, we present the various steps taken to analyze our data.

4.1 Instrument Validity

We begin our analysis by validating our study instrument. To determine the validity of our survey instrument we performed Principal Component Analysis (PCA) using SPSS. Before conducting PCA, the Kaiser-Meyer-Olkin (KMO) sampling adequacy was determined and found to be 0.72, well above the recommended 0.6. The Bartlett Test of Sphericity was significant at ($\chi^2(55) = 3792.0$, $p < 0.0001$). These two measures indicate that the data was suitable to conduct factor analysis [18].

Indicator reliability can be assumed because Cronbach's α of the strategies are all higher than a threshold value of 0.7 [19] except for liking and consensus strategies which showed a Cronbach's α of 0.56 and 0.45 respectively. This is acceptable because according to Peter [25], Cronbach's α should be ≥ 0.7, but for variables with 2-3 indicator, a Cronbach's $\alpha \geq 0.4$ is acceptable. The liking and consensus strategies contains 2 indicators each, therefore, Cronbach's α is within the acceptable range of ≥ 0.4.

After establishing the suitability of our data, we computed the average score for each strategy and then performed Repeated-Measure ANOVA (RM-ANOVA) with the strategies (reciprocity, scarcity, authority, commitment and consistency, and liking) as within-subject factors and gender and age as between-subject factors to explore for significant differences between the groups as well as to compare the overall

persuasiveness of the strategies. 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. Following findings of significant effects, we performed post-hoc pairwise comparisons, using the Bonferonni method for adjusting the degrees of freedom for multiple comparisons, to determine the groups that significantly differ from each other.

5 Result

We present the results for the overall persuasiveness of the strategies followed by the effects of gender and age on the persuasiveness of the strategies.

5.1 Overall Persuasiveness of the Strategies

Our results show significant main effects of strategy type ($F_{4.14,\ 4576.54}$=324.9, p≈.000, η^2=.227) on persuasiveness. This means that there are significant differences between the strategies with respect to their perceived persuasiveness overall. Regardless of gender and age group, commitment and reciprocity emerged as the most persuasive (significantly different from all other strategies as shown by the Bonferonni-corrected pairwise comparisons), whereas consensus and scarcity were the least persuasive (also significantly different from all others). The rest of the strategies (authority and liking) were in the middle, with liking leading the group, see Table 1.

In general, participants perceived all of the strategies as persuasive, well above the neutral rating of 3.5, see Figure 1.

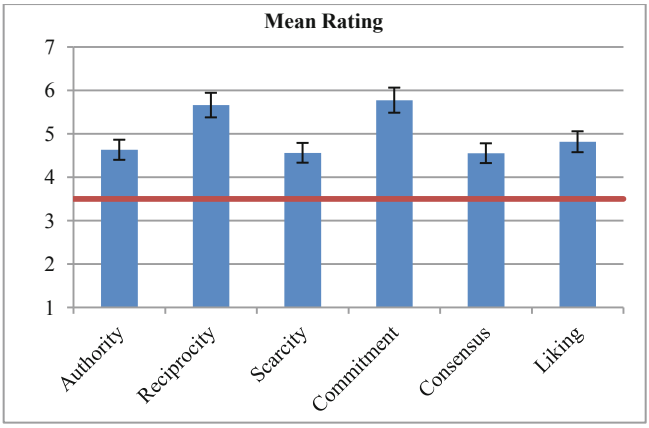

Fig. 1. A bar graph of the mean of individual strategies, showing their overall persuasiveness. Error bars represent a 95% confidence interval.

5.2 Gender Effects

The results of the RM-ANOVA showed a significant main effect of gender on persuasiveness ($F_{1,1106}$=7.3, p≈.007, η^2=.007). Overall, females rated the strategies as more persuasive than men. See Figure 2 and Table 2.

5.3 Interaction Between Gender and Strategies

The results of the RM-ANOVA showed a significant interaction between gender and strategy ($F_{4.138,4576.55}$ =3.2, p≈.011, η^2=.003). Pairwise comparisons showed that females found three out of the six strategies significantly more persuasive than males: reciprocity ($F_{1,1106}$=9.2, p≈.003, η^2=.008); commitment ($F_{1,\ 1106}$=9.1, p ≈.003, η^2=.008); and consensus ($F_{1,1106}$=10.6, p≈.001, η^2=.010), see Figure 2 and Table 2.

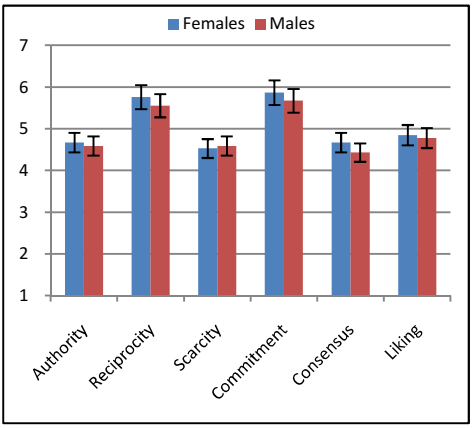

Fig. 2. Paired mean of individual strategies by gender. Error bars represent a 95% confidence interval.

Table 2. Mean and Standard Deviations (SD) for the strategies by gender. Bolded means are significantly different across males and females.; p<.005.

N = 1108						
Strategies	**Authority**	**Reciprocity**	**Scarcity**	**Commitment**	**Consensus**	**Liking**
	mean(SD)	mean(SD)	mean(SD)	mean(SD)	mean(SD)	mean(SD)
Females	4.67(1.29)	**5.76(1.10)**	4.53(1.46)	**5.87(1.04)**	**4.67(1.22)**	4.85(1.13)
Males	4.59(1.24)	**5.56(1.18)**	4.59(1.36)	**5.68(1.10)**	**4.43(1.19)**	4.78(1.14)

5.4 Age Effects

For the purpose of this study, we defined three age categories: 18-25, 26-35, and above 35. However, because we aimed at groups with a considerable age difference, we selected only participants within the 18-25 (younger adults) and above 35 (adults)

age categories for this analysis. Also to avoid comparing groups with unequal sample sizes we undersampled the younger adults group using SPSS random sampling. After, the random sampling, the dataset contains 298 younger adults and 284 adults.

The results of the RM-ANOVA showed no significant effect of age on the overall persuasiveness of the strategies ($F_{1, 580}$=2.4, p≈.125, η^2=.004). This means that the age groups did not perceive the strategies differently overall, establishing that there were no group-level differences in the ratings by the two age groups.

5.5 Interaction Between Age and Strategies

The results of the RM-ANOVA showed a significant interaction between age and strategy ($F_{4.118,2388.338}$=10.7, p≈.000, η^2=.018). Pairwise comparisons showed that adults found commitment ($F_{1,580}$=9.0, p≈.003, η^2=.015) significantly more persuasive than the younger adults, while younger adults found scarcity to be significantly more persuasive than adults ($F_{1,580}$=20.7, p≈.000, η^2=.034), see Figure 3 and Table 3.

The results show no significant three-way interaction between age, gender, and strategy ($F_{4.172,2912.37}$=0.672, p≈.618, η^2=.001).

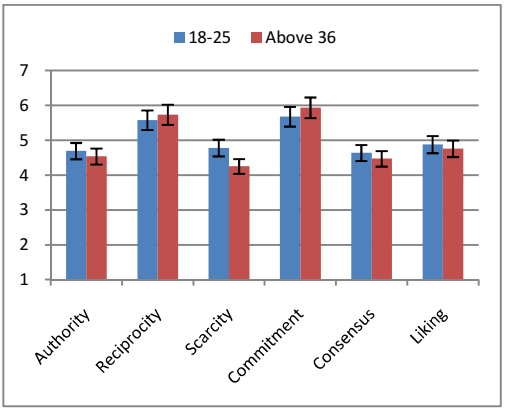

Fig. 3. Paired mean of individual strategies by age group. Error bars represent a 95% confidence interval.

Table 3. Mean and Standard Deviations (SD) for the strategies by age group. Bolded means are significantly different across the age group; p<.05.

N = 1108						
Strategies	**Authority**	**Reciprocity**	**Scarcity**	**Commitment**	**Consensus**	**Liking**
	mean(SD)	mean(SD)	mean(SD)	mean(SD)	mean(SD)	mean(SD)
18-25	4.70(1.20)	5.58(1.11)	**4.78(1.36)**	**5.68(1.11)**	4.64(1.16)	4.88(1.11)
Above 35	4.54(1.32)	5.74(1.10)	**4.26(1.44)**	**5.94(0.94)**	4.47(1.19)	4.76(1.06)

6 Discussion

This study presents the results of a large-scale study investigating gender and age differences in the persuasiveness of Cialdini's six persuasive strategies. It also provides a quantitative validation of the persuasive strategies overall.

The results of the analysis show that there are significant differences between the strategies with respect to their perceived persuasiveness overall. This means that the strategies are not equally persuasive – some of the strategies are perceived as more persuasive than others. In line with previous research, there are differences in the persuasiveness of the strategies across the gender and age groups. Below, we discuss the persuasiveness of the strategies individually.

6.1 Authority

According to Cialdini [3], establishing and revealing expertise can help to convince the persuadee. In this context, showing some expert endorsement of a PT could help increase its appeal [2]. Although authority is a widely-employed strategy, the results of our study show that it is not one of the best strategies with respect to the persuasiveness. It is significantly less persuasive than commitment and reciprocity. One explanation for this can be found in the statement by Rhoads and Cialdini [20]: "when feeling overwhelmed by a complicated and consequential choice, most individuals still want a fully considered, point by point analysis of it—an analysis they may not be able to achieve except, ironically enough, through a shortcut: reliance on an expert." This means that the persuasiveness of authority is contingent on many other factors including the persuadee's mode (in the case "feeling overwhelmed"). In addition, there has been an erosion of the culture of expertise in the past decade, and this change in how people perceive expertise could contribute to the lower persuasiveness of the strategy of authority [21].

Regarding gender differences, there was no significant difference between males and females with respect to their responsiveness to the authority strategy. Similarly, age has no significant impact in the participants responsiveness to the authority strategy. Younger adults and adults show a similar response to the authority strategy. This means that PTs employing the authority strategy in their design will persuade both gender (males and females) equally and both age groups (younger adults and adults) equally. However, it is important to note, that authority is not among the best strategy for any of the groups considered.

6.2 Reciprocity

Reciprocity is based on the idea that people by their nature feel obliged to return favor, to pay back. Thus when a persuasive request is made by a person the receiver feels indebted to, the receiver is more inclined to respond positively to the request Cialdini [11]. Although, reciprocity is not among the widely-employed strategies in PT design because of possible difficulty in operationalizing it in system design [4], the result from our study shows that reciprocity is among the best strategies that is

capable of motivating users to take a desired action. It is second to commitment in persuasiveness overall. Therefore, it could be employed to create compelling PTs. For example, it can be employed in PTs used for asking for academic favours such as a paper review request, requesting for answers from experts in a domain in forums like ResearchGate.

With respect to gender differences, reciprocity is one of the strategies that is perceived differently across the gender groups. Females are significantly more responsive to reciprocity strategy than males. This is probably because females tend to be more relational and community-oriented. For example, Billy and Udry [22] showed that compared to males, females maintain stronger relationships. These results are in line with [23–25], who found that women are more inclined to reciprocate. The finding indicates that females feel more indebted and obliged to pay back favor than men. However,there was no significant difference between younger adults and adults with respect to their responsiveness to the resprocity strategy.

6.3 Scarcity

The scarcity strategy is based on the principle that people tend to place more value on things that are in short supply. For example, announcing that a product or service is scarce will favor its evaluation and consequently increase the chance of purchase [26]. This is due to the popular belief that less-available options are of higher quality than those options that are more available. As a result, scarcity is one of the frequently-employed strategies in PT design, especially in the marketing domain. Surprisingly, the results of our study show that scarcity is among the least persuasive strategies overall – only slightly better than consensus.

Regarding gender and age, there was no significant difference between males and females with respect to their responsiveness to the scarcity strategy; however, there was a significant difference between the age groups, with younger adults being more responsive to the scarcity strategy than adults. This suggests that younger people have a greater tendency to evaluate the persuasive appeal via the pheripheral route (without thoughtfully considering the arguments) compared to the adults. This implies that an emotional persuasive approach may work well for younger adults [8].

6.4 Commitment and Consistency

People naturally strive to be consistent in their statements and behaviors [3]. According to Cialdini [3], people are more inclined to comply to a persuasive request that aligns with their previous behavior. Commitment emerged as the most persuasive of all the strategies for all the groups considered.

Our results suggest that females are more responsive to the commintment strategy than males and that adults are more responsive to the commitment strategy than younger adults. One possible explanation is that females and adults care more about their public image and strive to manage and maintain the impression that they have created to avoid feeling of inconsistency [27]. Another possible reason is that females and adults tend to experience higher cognitive dissonance, i.e., the discomfort that is

experienced when new information conflicts with existing beliefs, ideas, or values, and are therefore more responsive to the commitment strategy [28, 29]. The results suggest that persuasive approaches that require users to make any kind of commitment such as those that requires users to set a daily or weekly goal and compare achievement with set goal (as in Fish'n'Steps [30]) should be emphasized.

6.5 Consensus

According to the consensus principle, we often observe the behaviors of others to help us make decisions. Therefore, when a persuasive request is made, people are more inclined to comply if they are aware that others have complied [11]. This is one of the widely-employed strategies, however, the results of our study shows that consensus has the lowest persuasiveness of the six strategies

A possible reason for this shortfall in persuasiveness of the consensus strategy relative to the other strategies can be found in Cialdini's [3] statement that consensus is particularly impactful in situations of high uncertainty or ambiguity, when others are viewed as similar to oneself, and when there is substantial risk involved. This means that there are antecedent conditions (e.g., are others similar to me? How risky is the action?) that contribute to the persuasiveness of the consensus strategy. These conditions are not always present in all persuasive attempts. These results are similar to the research findings that show that social influence is not a significant determinant of healthy behavior [8].

With regards to gender and age, consensus is one of the strategies that is significantly different across genders. Females are more responsive to the consensus strategy than males; however, there is no effect of age on the response to the consensus strategy. The results are also similar to the research finding that females are more receptive to social influence than males [8], suggesting that females are more responsive to socially-driven strategies (such as consensus) than males.

6.6 Liking

The principle of liking states that individuals can be easily influenced or persuaded by someone they like. In relating this strategy to PT design, Oinas-Kukkonen [2] said "a system that is visually attractive for its users is likely to be more persuasive." The results from our study show that liking is not one of the best strategies with respect to the persuasiveness. In fact, it is significantly below commitment and reciprocity in overall persuasiveness.

With regards to gender and age effect, there is no significant difference between males and females and there is also no significant difference between younger adults and adults with respect to their responsiveness to the liking strategy. This means that PTs employing the liking strategy in their design will be equally persuasive for both males and females and for both younger adults and adults. However, it is important to note that liking is not among the best strategy for any of the groups.

6.7 Summary

Our study compares the persuasiveness of six persuasive strategies proposed by Cialdini and compares the effects by gender and age group. We present a summary of our findings in Table 3. It can guide designers in choosing the right strategy to motivate behavior change in both a one-size-fits-all approach or in a tailored approach that targets individual groups.

Table 4. Summary of persuasiveness to persuasive strategies. The strategies presented in descending order of persuasive strength (underlined is the highest).

Group	Strategy
Females	Commitment, Reciprocity, Liking, Consensus, Authority, Scarcity
Males	Commitment, Reciprocity, Liking, Scarcity, Authority, Consensus
Younger Adults	Commitment, Reciprocity, Liking, Scarcity, Authority, Consensus
Adults	Commitment, Reciprocity, Liking, Authority, 'Consensus', Scarcity
Overall	Commitment, Reciprocity, Liking, Authority, Scarcity, Consensus

7 Limitations

This study examined the perceived persuasiveness using self-reported measures; however, actual persuasiveness may be different when implemented and used in an implementation of a persuasive technology system. In addition, just like other population-based personalization, our results will apply to the majority of the group; however, there may be outliers who do not respond in the predicted manner.

8 Conclusions and Future Work

This paper presented the results of a large-scale study with three major goals: (1) to investigate the comparative persuasiveness of the six persuasive strategies (*reciprocity, scarcity, authority, commitment* and *consistency, and liking*) proposed by Cialdini; (2) examining for possible gender effects in the persuasiveness of the strategies; and finally (3) examining for possible age group differences in the persuasiveness of the strategies.

Our results show that in general, regardless of gender and age group, commitment followed by reciprocity emerged as the most persuasive strategies (significantly different from all the other strategies), whereas consensus followed by scarcity were the

least persuasive strategy (also significantly different from all others). The rest of the strategies (authority and liking) were in the middle, with liking leading the group, see Table 3.

We found that males and females differ significantly with regard to the responsiveness to three out of the six strategies. Specifically, females found reciprocity, commitment, and consensus more persuasive than males. This implies that females can be more easily persuaded using these strategies. It also implies that females may respond more favorably to persuasive attempts that offer some kind of reward to them even before they perform the desired behavior (reciprocity) or those that require them to commit to a long-term or short-term goal (in line with goal setting theory) than males. It also suggests that peer pressure may work better for females than males. Overall, females are more responsive to all the strategies except the scarcity than males. This implies that females are more persuadable than males with respect to the persuasiveness of the strategies overall.

Similarly, younger adults and adults differ significantly with regard to their responsiveness to two out of the six strategies. Specifically, adults found commitment more persuasive than younger adults, whereas younger adults perceive scarcity as more persuasive than adults. However, younger adults have a slightly higher persuasiveness score overall than adults.

Although future work should design and compare the effectiveness of the strategies in actual persuasive implementation, our study contributes important findings about population differences that are relevant to designers of persuasive technology interventions.

References

1. Fogg, B.J.: Persuasive Technology: Using Computers to Change What We Think and Do. Morgan Kaufmann (2003)
2. Oinas-Kukkonen, H., Harjumaa, M.: Persuasive systems design: Key issues, process model, and system features. Commun. Assoc. Inf. Syst. 24, 28 (2009)
3. Cialdini, R.: Harnessing the science of persuasion. Harv. Bus. Rev. 79, 72–79 (2001)
4. Kaptein, et al.: Adaptive Persuasive Systems. Trans. Interact. Intell. Syst. 2, 1–25 (2012)
5. Orji, R.: Design for Behaviour Change: A Model-driven Approach for Tailoring Persuasive Technologies. PhD Thesis, University of Saskatchewan, Canada. Accessed from http://hdl.handle.net/10388/ETD-2014-06-155 (Access No. 10388/ETD-2014-06-1555)(2014)
6. Orji et al Modeling the efficacy of persuasive strategies for different gamer types in serious games for health. User Modeling and User-Adapted Interaction. 24: 453--498 (2014).
7. Kaptein, M., Lacroix, J., Saini, P.: Individual differences in persuadability in the health promotion domain. In: Ploug, T., Hasle, P., Oinas-Kukkonen, H. (eds.) PERSUASIVE 2010. LNCS, vol. 6137, pp. 94–105. Springer, Heidelberg (2010)
8. Orji, R.O., Vassileva, J., Mandryk, R.L.: Modeling Gender Differences in Healthy Eating Determinants for Persuasive Intervention Design. In: Berkovsky, S., Freyne, J. (eds.) PERSUASIVE 2013. LNCS, vol. 7822, pp. 161–173. Springer, Heidelberg (2013)
9. Orji, R., Mandryk, R.L.: Developing culturally relevant design guidelines for encouraging healthy eating behavior. Int. J. Hum. Comput. Stud. 72, 207–223 (2014)

10. Dawson, et al.: Examining gender differences in the health behaviors of Canadian university students. J. R. Soc. Promot. Health 127, 38–44 (2007)
11. Cialdini, R.B.: The Science of Persuasion. Sci. Am. Mind. 284, 76–84 (2004)
12. Clark, W.R., Tennessee, M.: Using the Six Principles of Influence to Increase Student Involvement in Professional Organizations: A Relationship Marketing Approach. J. Adv. Mark. Educ. 12, 43–52 (2008)
13. Kaptein, M., Markopoulos, P., de Ruyter, B., Aarts, E.: Can you be persuaded? individual differences in susceptibility to persuasion. In: Gross, T., Gulliksen, J., Kotzé, P., Oestreicher, L., Palanque, P., Prates, R.O., Winckler, M. (eds.) INTERACT 2009. LNCS, vol. 5726, pp. 115–118. Springer, Heidelberg (2009)
14. Halko, S., Kientz, J.A.: Personality and Persuasive Technology: An Exploratory Study on Health-Promoting Mobile Applications. In: Ploug, T., Hasle, P., Oinas-Kukkonen, H. (eds.) PERSUASIVE 2010. LNCS, vol. 6137, pp. 150–161. Springer, Heidelberg (2010)
15. Cialdini, et al.: Preference for consistency: The development of a valid measure and the discovery of surprising behavioral implications 69, 318–328 (1995)
16. Mason, W., Suri, S.: Conducting behavioral research on Amazon's Mechanical Turk. Behav. Res. Methods. 44, 1–23 (2012)
17. Buhrmester, M.D., Kwang, T., Gosling, S.D.: Amazon's Mechanical Turk A New Source of Inexpensive, Yet High-Quality, Data? Perspect. Psychol. Sci. 6, 3–5 (2011)
18. Hinton, et al.: SPSS Explained. Routledge (2004)
19. Chin, W.W.: The Partial Least Squares Approach to Structural Equation Modeling, http://www.bibsonomy.org/bibtex/276aba15e34b8d636650ed79f1581f50b/naegle
20. Rhoads, K.V., Cialdini, R.B.: The business of influence: Principles that lead to success in commercial settings. In: The Persuasion Handbook: Dev. in Theory and Pract., pp. 513–542 (2002)
21. Pure, et al: Understanding and Evaluating Source Expertise in an Evolving Media Environment. In: Takševa, T. (ed.) Social Software and the Evolution of User Expertise: Future Trends in Knowledge Creation and Dissemination, pp. 37–51. IGI Global (2013)
22. Billy, J.O., Udry, J.R.: Patterns of adolescent friendship and effects on sexual behavior. Soc. Psychol. Q., 27-41 (1985)
23. Dohmen, et al.: Representative Trust and Reciprocity: Prevalence and Determinants. Econ. Inq. 46, 84–90 (2006)
24. Rau, H.A.: Trust and Trustworthiness: A Survey of Gender Differences. Psychol. Gend. Differ., 205–224 (2011)
25. Chaudhuri, A., Gangadharan, L.: Gender Differences in Trust and Reciprocity (2003)
26. West, S.G.: Increasing the attractiveness of college cafeteria food: A reactance theory perspective. J. Appl. Psychol. 6, 656 (1975)
27. Orji, et al.: Providing for Impression Management in Persuasive Designs. Adj.Proc. Persuasive Technology. Accessed http://hci.usask.ca/publications/view.php?id=285 (2012)
28. Lackenbauer, S.D.: Do I Feel Dissonance Over You? Sex Differences in the Experience of Dissonance for Romantic Partners (2011)
29. Dare, B., Guadagno, R., Nicole Muscanell, M.A.: Commitment: The Key to Women Staying in Abusive Relationships. J. Interpers. Relations, Intergr. Relations Identity 6, 58–64 (2013)
30. Lin, J.J., Mamykina, L., Lindtner, S., Delajoux, G., Strub, H.B.: Fish'n'Steps: Encouraging physical activity with an interactive computer game. In: Dourish, P., Friday, A. (eds.) UbiComp 2006. LNCS, vol. 4206, pp. 261–278. Springer, Heidelberg (2006)