Game Preferences and Personality of Older Adult Users

A.F.A. de Vette[1]
a.f.a.devette@utwente.nl

M. Tabak[1,2]
m.tabak@rrd.nl

M.M.R. Vollenbroek-Hutten[1,2]
m.vollenbroek@rrd.nl

H.J. Hermens[1,2]
h.hermens@rrd.nl

[1]University of Twente
Faculty of Electrical Engineering
Mathematics and Computer Science,
Telemedicine group, P.O. Box 217,
7500 AE, Enschede, the Netherlands

[2]Roessingh Research and Development
Telemedicine group, P.O. Box 310,
7500 AH, Enschede, the Netherlands

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Abstract
To improve engagement needed for long-term adherence to telemedicine services for elderly users, we need methods to design effective and tailored gamification. This study explores the relation between personality (based on the Five Factor Model) and game preference (based on the Five Domains of Play theory) to enable creation of such a method, by means of a user classification targeting the older adult user. From preliminary results, in a study with 12 participants aged 65-75 years, we observe no significant correlations between personality and game preference. The participants have a strong preference for a game containing novel content. This study provides us with information on the older adult to create a method for developing tailored gamified content based on game preferences.

Author Keywords
Telemedicine; gamification: older adult; elderly; game preference; personality; classification.

ACM Classification Keywords
H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous; J.3.0 [Computer Applications], Life and Medical Sciences – *Health*; K4.2 [Computers and Society], Social Issues – *Assistive technologies for persons with special needs*; K8.0 [Personal Computing]: General – *Games.*

Introduction

Telemedicine can be particularly beneficial for the older adult [6]. However, adherence to telemedicine interventions is low and decreases over time [2][7]. Therefore, there is a need for strategies to engage older adults in the prolonged use of telemedicine solutions. Gamification – the application of game elements in non-gaming context [1] – may be such a strategy [3]. It is however unknown how to apply gamification for older adult users to produce long-term engagement [9]. By gaining insight in the preferences of users, a method to construct gamification that effectively addresses the (individual) older adult user can be developed. Previous results indicate a relation between personality and game preference for users under 60 years old [10], which may serve as a basis for such a method, by means of a classification of older adult users, as well. Therefore, as a first step toward creating tailored game content, the aim of this study is to explore the relation between personality and game preference specifically for the older adult user.

Study set-up

The study included a personality questionnaire, a game preference questionnaire and a semi-structured interview. In addition, the participants were given tablets with a set of specific games to play with during 5 days.

Low score	FFM factor 5D domain	*High score*
Cautious, predictable Conventional experiences	Openness to Experience Novelty	Inventive, curious Open, imaginative experiences
Careless, impulsive Low difficulty, contentment	Conscientiousness Challenge	Efficient, organized High difficulty, achievement
Reserved, solitary Single-player, slow pace	Extraversion Stimulation	Energetic, outgoing Multi-player, excitement
Analytical, detached Violence, competition	Agreeableness Harmony	Friendly, compassionate Cooperation, altruism
Confident, secure Cheerful, calm	Neuroticism Threat	Nervous, sensitive Stressful, hostile

Table 1. The Five Factor Model of personality and the Five Domains of Play model, including personality/game preferences for both extremes (deduced from Vandenberghe, 2012 [8]).

Personality was measured using the NEO-PI-R Five Factor model (FFM) inventory [4][5]. The Five Domains of Play theory (5D) was used to measure game preferences [8]. The 5D theory translates the five factors from the FFM that describe personality into aspects of gaming motivation *(table 1)*. Each person is ranked on each of the five domains, thereby creating a character description that provides insight in the content that may satisfy the player.

A background on game content was provided to the user by means of five games on a tablet pc, randomly ordered on the home screen, which aided the participant to adequately answer the questions determining game preferences and tracked play time *(table 2)*. Each game corresponded with an alternating extreme in the 5D theory (high Novelty, low Challenge, and so on). After 5 days of freely playing the games of choice, the study concluded with a questionnaire on game preferences and an additional interview.

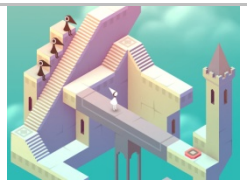
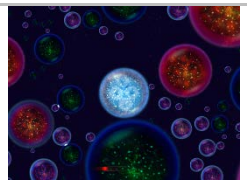
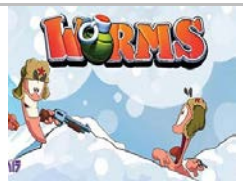
Game 1 – High score on Novelty	Game 2 – Low score on Challenge	Game 3 – High score on Stimulation	Game 4 - Low score on Harmony	Game 5 – High score on Threat
Monument Valley	Osmos	DinerDash	Worms	Dead Runner
				
2175 min.	504 min.	438 min.	353 min.	244 min.

Table 2. Selection of five games each participant played on tablet, including total play time of all participants (n=12).

Results

Twelve people between the age of 65 and 75 years old participated in the study, recruited through a local community centre. The average use time on the total of five games was over 5 hours per participant. Game 1 was favoured by 11 out of 12 participants with a total play time of 2175 minutes *(table 2)*, which is an average of 3 hours per person.

Table 3 shows correlations between the FFM factors (P) and 5D domains (G) as intended by the models (Openness – Novelty, Conscientiousness – Challenge, and so on), which were explored with Spearman's Rho for all users (significance level $\alpha = 0{,}05$). A significant relation between personality and game preference was not observed in the group of older adults in this study, conflicting with earlier obtained results from users <60 years old.

Spearman's rho	G_Threat	G_Stimulation	G_Novelty	G_Harmony	G_Challenge
P_Neuroticism	0,07	-0,70*	-0,28	-0,10	-0,12
P_Extraversion	-0,15	0,40	0,03	0,12	-0,05
P_Openness	0,08	-0,25	0,25	0,09	0,77
P_Agreeableness	-0,29	0,62*	0,27	0,19	0,06
P_Conscientiousness	0,22	-0,04	-0,07	-0,42	0,23

Table 3. Correlation coefficient (n = 12) between personality (P) and game preference (G). *. Correlation is significant at the 0.05 level (2-tailed).

Discussion and conclusion

This study shows that older adult users have a strong preference for a game with high Novelty content, and that significant correlations between personality and game preference were not found. A possible explanation for this observation may be that an extensive experience with video games, only acquired when growing up playing video games, is essential for being able to classify user preferences in a model such as used in this study. Indeed, in our previous study [10] we found indications for the existence of a relation between personality and game preference in participants younger than 60 years old. When the younger people of this generation have aged, it would be interesting to repeat this study.

From our preliminary results we could conclude that personality of the older adult user does not directly indicate game preferences. However, we will further analyse the game preferences of the individual participants – combined with the monitored use time data of the games played with qualitative information from interviews – and create design guidelines that can be translated into tangible design that is tailored to the end user.

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