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Abstract

There are diverse segmentations of online players in the literature. Most of them are proposed a priori, and there are no segmentations based on the acceptance of technology and the personal values of the players. The foremost purpose of this study is to obtain a clustering of online video games players, founded on UTAUT model, and to describe the subsequent segments consistent with the personal values of Schwartz. The measurement model and the structural model was analyzed with partial least squares (PLS). Subsequently, the POS-PLS technique has been devoted to inspect unobserved heterogeneity and to find players' segments. Four segments are obtained from the statistical tools.

Keywords

Online video games, POS-PLS, UTAUT model, personal values.

1. Introduction

In last years, online video games have converted in a way of enjoyment, and a normal diary activity at a worldwide level (Hamari and Tuunanen, 2014). Nevertheless, the study of personal profiles of online video game players is relatively recent.

Until a few years ago, and for purposes of generalizing the behaviour, video game players were considered as a unique archetype. This ignored the fact that different people decide to play for very diverse reasons, and the same video game can have deeply distinct meanings for unlike players (Yee, 2006).

Nowadays, there are diverse segmentations of online players in the literature (Yee, 2006; Yee et al, 2012; Tseng, 2011; Ip and Jacobs, 2005; Bartle, 1996). Most of them are proposed a priori, and there are no segmentations based on the acceptance of technology and the personal values of the players. In addition, only a few studies link the personal values to video game (Francis et al, 2016; Baranowski et al., 2010; Flanagan et al, 2007). We propose a posteriori segmentation of players based on the technology acceptance model and personal values in this study, this the main contribution of this paper.

In particular, the main aim of this study is to find a segmentation of online video games players, based on Unified Theory of Acceptance and Use of Technology (UTAUT), and to explain the resulting segments according to the personal values of Schwartz.

This paper is structured in the following way. Firstly, we exposed the theoretical framework including an explanation about: (1) videogame players' typology, (2) personal values, (3) proposed model based on UTAUT. Secondly, the methodology section is included. Thirdly, the main results are presented. And, finally, a discussion including the main conclusions are offered.

2. Theoretical framework

2.1. Video game players' typology

The progress in business practice associated with online games has introduced the need to distinguish between different types of players (Hamari and Tuunanen, 2014). According to this fact, the literature points out diverse approaches and classifications of online players.

From the perspective of behavior, the most widely used classification is the one proposed by Richard Bartle in 1996. Based on data from players in multi-player games in virtual worlds, Bartle study indicates a taxonomy of four types of players (Bartle, 1996). This taxonomy emerges from the analysis of the style of play in two dimensions: action versus interaction, and orientation to the world versus orientation to players. The first type of player is one that prefers the action and is oriented towards the world; this is called Archiver; the second type of player is one that similarly prefers the action, but is oriented towards the players, and this is designated as Killer. The third type of player is one who prefers the interaction and is oriented towards the world; this is named Explorer; the fourth type of player also prefers the interaction, but is oriented towards the players; this is denominated Socialiser. Applied the same perceptive of behavior, Ip and Jacobs segment the players into two groups in relation to the intensity of use of the game (Ip and Jacobs, 2005). According to the study results of these authors, there are casual players and hardcore players, the last ones, unlike the first ones, are dedicated to the game in almost every way.

From a psychological perspective, Fan-Chen Tseng explores the motivations of online gamers, and from the analysis of those motivations, and in relation to the needs for exploration and for aggression, proposes a classification of players into three segments (Tseng, 2011). The first segment is the aggressive players; these players have high needs for exploration and for aggression; the second segment is the social players; these players have high needs for exploration, but low needs for aggression, and finally; the third segment is composed of the inactive players; these players have low need for exploration and medium needs for aggression. Lastly, from this same perspective, Nick Yee proposed and subsequently validated with colleagues, a classification of on-line players based on their motivations (Yee, 2006; Yee et al, 2012). According to this classification, there are three types of on-line players, players motivated by achievement, players motivated by social aspects, and players motivated by the sense of immersion.

2.2. Personal Values

According to Abbasi & Hollman (1987) personal values are not easy to delimit because they have different meanings for people, according to their society and cultural origin. In fact, values shape a large part of personality, behavior and existence, making it difficult to think about them impartially (Medina, 2016).

There is a discrepancy regarding a unique definition of the concept of value. But, some common elements appear in most definitions (Arciénaga & González, 2002, Medina, 2016). Values refer to beliefs about states or behaviors desired. These beliefs transcend delimited situations, and are generalizable. According to Gouveia (2003; 2009) to find erroneous interpretations

regarding the content of values is frequent. The values govern or evaluate the selection of behaviors and are usually socially desirable, serving as a guideline for the actions of people, so they are not congenital qualities of objects. Values are established by relative importance, consistent with Rohan (2000) they are organized in degrees and personal systems. Thus, although people differ in their value hierarchies, the structure of their value system would be universal (Schwartz, 1996). That is, people differ only in terms of the relative magnitude they bring to a universally important set of values. Finally, values are developed through the social, cultural and personal influence of the subject.

According to Coombs-Richardson & Tolson (2005) the values could be perpetual, but they are not totally invariable and can change to adjust to the changes of a society in progress. Thus, personal values are influenced to a great extent by age, gender, education and cultural changes of the society (Castro & Nader, 2006; Cileli, 2000). However, changes experienced by values are more slow than the economic and social ones.

Shalom Schwartz's model for measuring personal values has brought together solid data that, to a large extent, is corroborated cross-culturally. His model has been confirmed in more than 344 samples from 83 countries (Schwartz et al., 2012).

The revised theory of individual values developed by Schwartz and his colleagues (Schwartz et al, 2012) presents nineteen values that differ from the original theory. It distinguishes between three types of Universalism (concern, nature, tolerance), two types of Benevolence (caring, dependability), two Self-direction (thought, action), two Conformity (rules, interpersonal), two Power (dominance, resources), and two Security (personal, societal). In addition, introduces two new basic values, Humility and Appearance (Face). These more specific values are aimed at improving the predictive and explanatory power of values (Medina, 2016), see Table 1.

Value	**Conceptual definitions in terms of motivational goals**
Self-Direction—Thought	Freedom to cultivate one's own ideas and abilities
Self-Direction—Action	Freedom to determine one's own actions
Stimulation	Excitement, novelty, and change
Hedonism	Pleasure and sensuous gratification
Achievement	Success according to social standards
Power—Dominance	Power through exercising control over people
Power—Resources	Power through control of material and social resources
Face	Maintaining one's public image and avoiding humiliation
Security—Personal	Safety in one's immediate environment
Security—Societal	Safety and stability in the wider society
Tradition	Maintaining and preserving cultural, family or religious traditions
Conformity—Rules	Compliance with rules, laws, and formal obligations
Conformity—Interpersonal	Avoidance of upsetting or harming other people
Humility	Recognizing one's insignificance in the larger scheme of things
Universalism—Nature	Preservation of the natural environment
Universalism—Concern	Commitment to equality, justice and protection for all people
Universalism—Tolerance	Acceptance and understanding of those who are different from oneself
Benevolence—Caring	Devotion to the welfare of in-group members
Benevolence—Dependability	Being a reliable and trustworthy member of the in-group

Table 1. The 19 values in the Refined Theory
Source: (Schwartz et al, 2012)

These authors produce the order of the 19 distinct values in Figure 1. The three outer circles classify the theoretical bases for this order. They conjecture that the values constrained by the top half of the outermost circle express growth and self-expansion and are more likely to inspire people when they are free of anxiety. The values restricted by the lower half of the outermost ring are directed toward protecting the self against anxiety and threat. The values on the right in the next circle have an individual focus— concern with results for self. Those on the left have a social focus— concern with results for others or for established organizations (for a deeper explanation of the Figure 1 you can see the original paper of Schwartz et al., 2012).

Fig. 1: Proposed circular motivational continuum of 19 values.
Fuente: (Schwartz et al., 2012)

2.3.Proposed model based on UTAUT

Venkatesh et al. (2003) empirically compared previous technology acceptance models, and based on them, they formulated a unified model that integrates elements across the earlier models. Next, Venkatesh and colleagues empirically confirmed their model to give greater reliability to their contribution. By encompassing the combined exploratory power of the individual models and key moderating influences, UTAUT advances cumulative theory while retaining a parsimonious structure (Rondan-Cataluña et al., 2015). The proposed model is presented in Figure 1.

UTAUT proposed four latent variables that determine user acceptance and usage behavior (USE): performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FC). These four constructs directly affect behavioral intention (BI). In addition, behavioral intention straight influences the use of the technology, and the facilitating conditions directly determine use behavior of technology (Venkatesh et al., 2003).

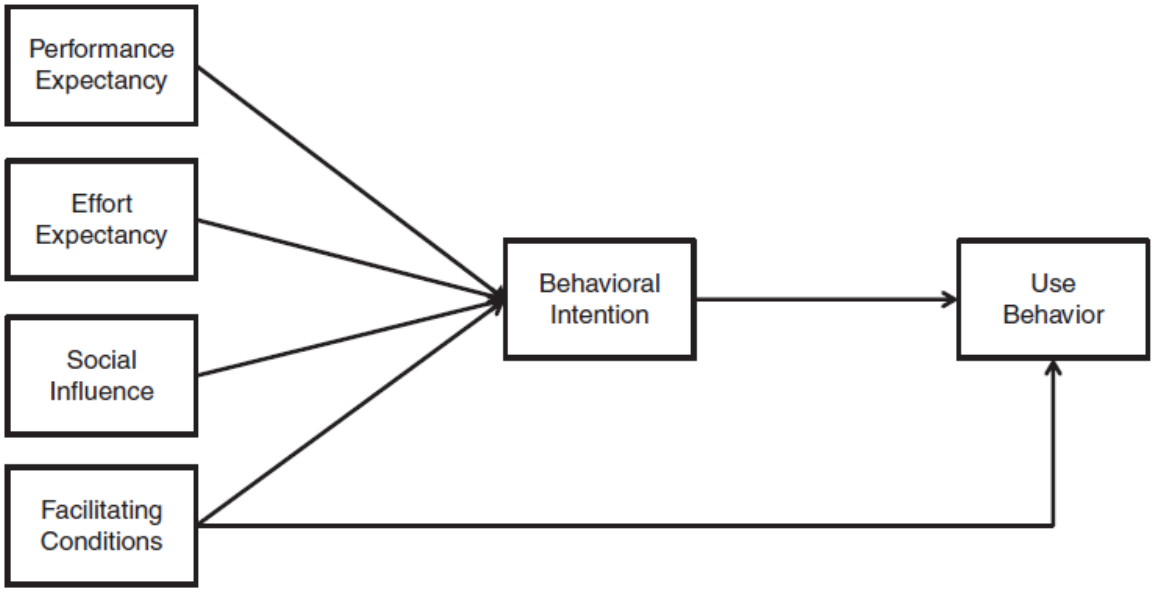

Fig. 2: UTAUT model.
Source: Venkatesh et al (2003)

3. Methodology

The sample was made up of 373 undergraduate students of a University from the south of Spain that play usually online video games. The sampling method was non-random, we made personal interviews in the classrooms to the students. The average age was 20.72 years old, males (54.7%) and females (45.3%).

The UTAUT scale (Venkatesh et al., 2003) was adapted to the video game players and translated to Spanish. In addition, personal value scale (Schwartz et al, 2012) was translated to Spanish language.

The measurement model and the structural model was analyzed with partial least squares (PLS) (Esposito Vinzi, Chin, Henseler, & Wang, 2010). Subsequently, the POS-PLS technique has been devoted to inspect unobserved heterogeneity and to find players' segments. This technique allows to calculate the parameters and segments membership of observations simultaneously (Becker et al., 2013). The SmartPLS 3.2 software package is applied to perform these analyses (Ringle, Wende, & Becker, 2014). Finally, the resulting segments are characterized via an ANOVA analysis. The authors did this using SPSS 23 software.

The analysis of structural equation modelling, including the PLS, consists of two steps. Firstly, the analysis of the reliability and validity of the measurement scales is discussed. And secondly, the proposed structural model is evaluated. In this case, a third step has been added, between the two previous ones, we have performed the POS-PLS analysis in order to detect the heterogeneity of behaviors among the individuals in the sample.

4. Results

Firstly, the reliability and validity of the measurement model have been analyzed, following the recommendations published in the literature (Fornell and Larcker, 1981; Henseler et al., 2016). In the case of reflective variables, as in our case, the individual reliability of each item is ensured through loadings of more than 0.7 on its own latent variables. Second, we analyze the reliability of the constructs using the Cronbach Alpha and Composite reliability. In all cases, our

indicators are higher than 0.7. In addition, convergent validity has been ensured by analyzing the Average Variance Extracted (AVE). In our case, all the indicators offered levels above the 0.5 score proposed by the literature. Finally, discriminant validity was assessed in two ways: using the Fornell and Larcker test and using Heterotrait-Monotrait (HTMT), which together offered levels below 0.9 (Henseler et al., 2015, 2016). In short, the results of the analyses ensure the validity and reliability of the measurement scales used.

As a second step, PLS-POS was applied following the guidelines proposed by Becker et al. (2013). As a result, four player segments have been obtained. To determine the optimal number of segments, we adopted the criterion of the mean of the explained variance of the proposed model, see Figure 3. The size of the segments is shown in Table 2. The four segments model achieve the highest average R^2.

Seg. 1	Seg. 2	Seg. 3	Seg. 4	Total
81	26	134	124	365
22.19%	7.12%	36.71%	33.97%	

Table 2. Segments size.

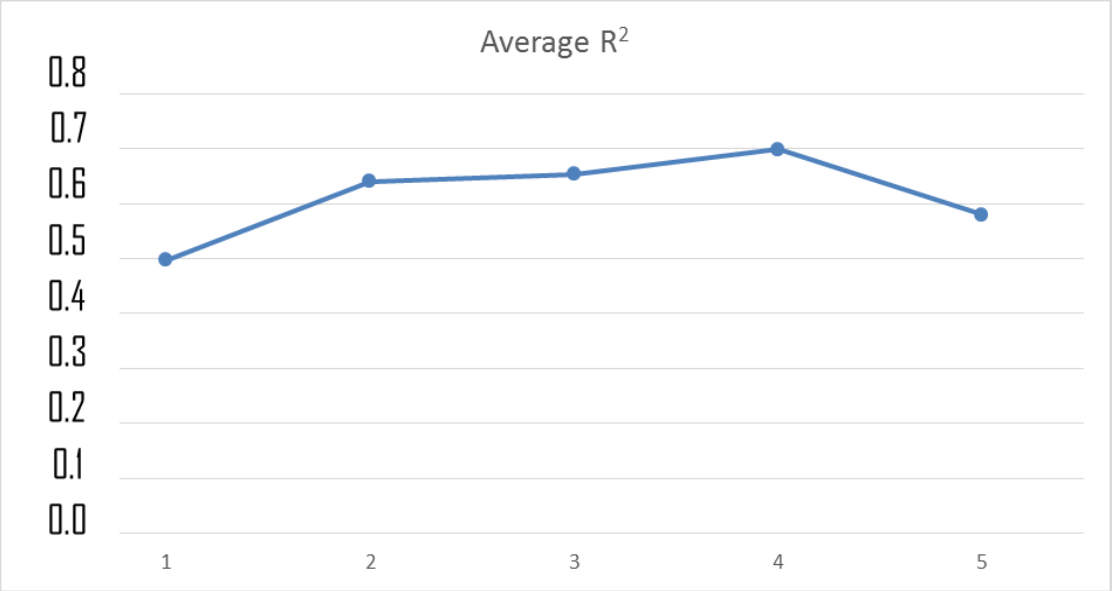

Fig. 3: Average R^2.

Finally, as a third step, the assessment of the structural model, in the global sample and for each one of the four segments obtained in the previous step, has been approached. For this, the values of the path coefficients and the explained variance of the endogenous variables (R^2) are analyzed (Tables 3 and 4). The path coefficients indicate the intensity and the sign of the relationship between the dependent and independent variables. A bootstrapping has been used to calculate the reliability of the path coefficients in the hypothesized relations. In addition, the SRMR indicator was calculated for the complete sample. SRMR is a measure of the overall fit of the model, especially suitable for PLS. In our case, a value of 0.07 less than 0.08 was obtained (Henseler et al., 2015).

	Global		Seg. 1		Seg. 2		Seg. 3		Seg. 4	
	Paths	**PValues**	**Paths**	**PValues**	**Paths**	**PValues**	**Paths**	**PValues**	**Paths**	**PValues**
BI -> USE	**0.790**	**0.000**	**0.741**	**0.000**	-0.009	0.916	**0.945**	**0.000**	**0.918**	**0.000**
EE -> BI	**0.189**	**0.000**	0.137	0.146	0.270	0.272	-0.128	0.071	**0.333**	**0.000**
FC -> BI	**0.156**	**0.001**	-0.134	0.088	0.238	0.226	**0.423**	**0.000**	0.099	0.145
FC -> USE	-0.021	0.518	**0.449**	**0.000**	**0.979**	**0.000**	**-0.075**	**0.002**	**-0.607**	**0.000**
PE -> BI	**0.278**	**0.000**	**0.257**	**0.031**	0.272	0.352	**0.613**	**0.000**	-0.124	0.085
SI -> BI	**0.271**	**0.000**	**0.603**	**0.000**	-0.384	0.087	0.020	0.759	**0.667**	**0.000**

Table 3. Path coefficients.

	Global	**Seg. 1**	**Seg. 2**	**Seg. 3**	**Seg. 4**
BI	0.382	0.587	0.400	0.511	0.619
USE	0.613	0.886	0.953	0.841	0.791

Table 4. Explain variance of endogenous variables (R^2).

Subsequently, a Multi-Group Analysis (MGA-PLS) was performed to compare the differences in the model between the four segments resulting from the PLS-POS analysis (Table 5).

	(Seg. 1 vs Seg. 2)			(Seg. 1 vs Seg. 3)			(Seg. 1 vs Seg. 4)			(Seg. 2 vs Seg. 3)			(Seg. 2 vs Seg. 4)			(Seg. 3 vs Seg. 4)		
	Dif Path	**PLS-MGA**	**Parametric Test**	**Dif Path**	**PLS-MGA**	**Parametric Test**	**Dif Path**	**PLS-MGA**	**Parametric Test**	**Dif Path**	**PLS-MGA**	**Parametric Test**	**Dif Path**	**PLS-MGA**	**Parametric Test**	**Dif Path**	**PLS-MGA**	**Parametric Test**
BI -> USE	0.750	**0.000**	**0.000**	0.204	**1.000**	**0.000**	0.178	**0.995**	**0.023**	0.954	**1.000**	**0.000**	0.927	**1.000**	**0.000**	0.027	0.350	0.680
EE -> BI	0.133	0.719	0.534	0.264	**0.012**	**0.024**	0.196	**0.961**	0.051	0.398	0.064	**0.039**	0.063	0.589	0.697	0.461	**1.000**	**0.000**
FC -> BI	0.372	0.952	**0.036**	0.557	**1.000**	**0.000**	0.233	**0.989**	**0.022**	0.185	0.827	0.318	0.139	0.212	0.397	0.324	**0.001**	**0.001**
FC -> USE	0.530	**1.000**	**0.000**	0.524	**0.000**	**0.000**	1.056	**0.000**	**0.000**	1.054	**0.000**	**0.000**	1.586	**0.000**	**0.000**	0.532	**0.000**	**0.000**
PE -> BI	0.015	0.556	0.953	0.356	**0.997**	**0.003**	0.381	**0.001**	**0.003**	0.341	0.887	0.077	0.396	0.117	0.051	0.737	**0.000**	**0.000**
SI -> BI	0.987	**0.003**	**0.000**	0.583	**0.000**	**0.000**	0.064	0.699	0.579	0.405	**0.955**	**0.019**	1.051	**0.999**	**0.000**	0.647	**1.000**	**0.000**

Table 5. Comparison of models by segments.

Finally, in order to characterize the four segments, we analyzed the ten personal values of the players, the variables included in the UTAUT model, the age, experience, money consumed in the purchase of online games, money spent in purchases within own online games, and number of games downloaded in the last year. An analysis of the variance (ANOVA) was performed for all these continuous variables (Table 6). As a result, only the personal values of universalism, achievement, and benevolence offered significant differences between the segments. And among the variables included in the UTAUT model facilitating conditions and social influence shown statistical differences between the four groups.

On the other hand, chi-square test was used to search for association between categorical variables (gender, activity, type of device, operating system of device, if purchases were made, and who paid those purchases) and the segments obtained. There was no association between the segments obtained and none of the demographic variables (gender and activity), nor related to the characteristics of the devices (type of device and operating system). However, although no association has been found between making additional purchases and segments, we have found association with the variable who pays for those purchases. In this sense, most users make purchases with money that does not come from their own pocket. But the Segment 2 is especially characterized because most of the purchases are made with the players' own money.

	Seg.	N	Media	Sig.
Benevolence	1	78	5.3590	**0.010**
	2	25	5.1200	
	3	134	4.9627	
	4	123	5.4106	
	Total	360	5.2125	
Universalism	1	81	5.0679	**0.044**
	2	26	4.7885	
	3	135	4.5296	
	4	127	4.8583	
	Total	369	4.7791	
Achievement	1	78	5.2885	**0.016**
	2	25	4.7000	
	3	134	4.6642	
	4	123	4.9715	
	Total	360	4.9069	
SI	1	80	.1053377	**0.033**
	2	26	-.1043753	
	3	135	-.1687326	
	4	123	.1387451	
	Total	364	.0000000	
FC	1	79	.1121918	**0.014**
	2	23	-.2219977	
	3	129	-.2389882	
	4	117	.2313870	
	Total	348	.0000000	

Table 6. Descriptive analysis and ANOVA p-values.

4. Discussion and conclusions

The foremost purpose of this study is to find a segmentation of online video games players, based on UTAUT model, and to describe the subsequent segments according to the personal values of Schwartz.

We have verified that the UTAUT model can serve as a basis for online player segmentation. This fact is especially relevant because we are segmenting the individual of the sample based on the behavior of online players regarding product acceptance. Although there are other technology acceptance models (Venkatesh et al., 2012; Van der Heijden, 2004), the parsimony of the UTAUT model allows us to successfully apply the POS-PLS segmentation tool. In addition, data analysis shown that the explained variance of both USE and BI (which are the endogenous variables of the model) are significantly improved by comparing the results of the global sample versus those obtained in each of the 4 segments. A difference with respect to the results of the original UTAUT model is that the relationship between FC and USE is not significant. On the contrary, FC shows a significant positive relation as antecedent of BI. These results could be explained by the hedonic nature of online video games, given that if a player has the necessary conditions to play he could also opt for another leisure activity and has no obligation to use the system.

In the Figure 4, we present the profiles of the four segments with respect to the Schwarz values that were significantly different in the ANOVA.

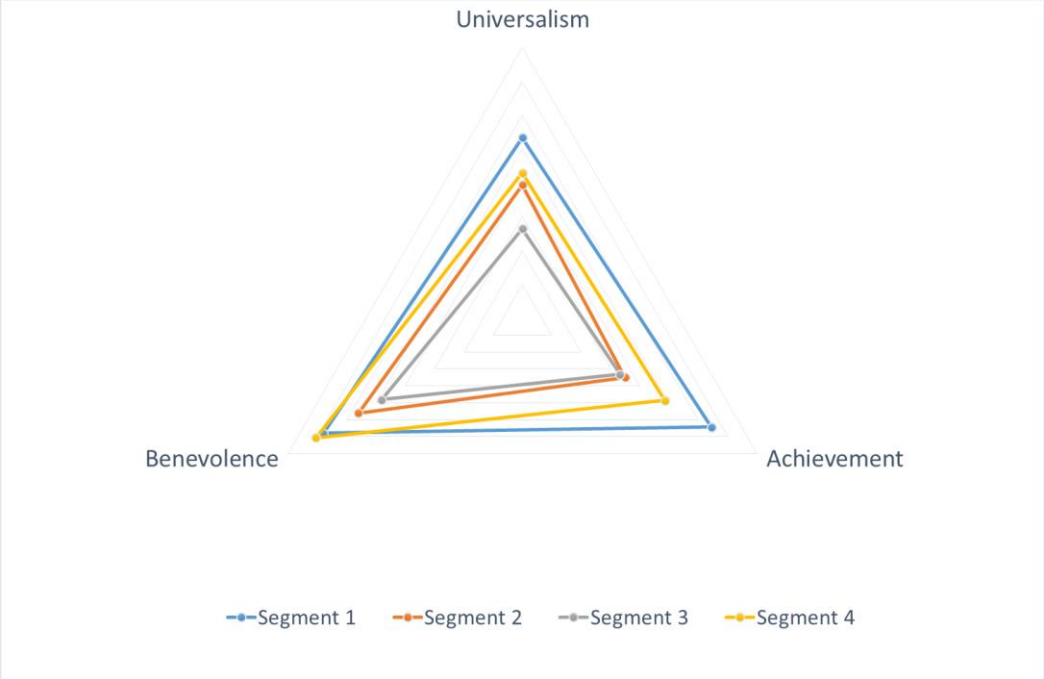

Fig. 4: Profile with regard to personal values.

Now we offer an explanation of the segments found.

Segment 1 SOCIAL-UNIVERSALIST. This segment has an intermediate size (22%) of players. With respect to Schwarz's personal values is the group that attaches greater importance to universalism and achievement, and they are above average in the importance granted to benevolence. On the other hand, they establish levels of SI and FC above the average. In general, these results show a group of players characterized by a high social influence and sense of belonging to the group. This segment is also characterized by having the material and technical tools to play and achieve success or achievement with this activity, but without detracting from universal values such as equality, protection of nature or tolerance. In this group BI is mainly explained by SI, however, neither EE nor FC have a significant influence on BI.

Segment 2 SELFISH. This is the smallest group, only 7% of the sample. It is characterized by an IS and FC below the average, that is to say they are less influenced by the group and have fewer external conditions to play video games online. From the point of view of their personal values, they can be identified with less concern for success in line with social standards. Their concern for benevolence is below average and therefore care less about the welfare of the group. Finally, regarding universalism offer values very close to the global average. But the Segment 2 is especially characterized because most of the purchases of online video games are made with their own money. This group is the one that has a more different behavior from the rest. The only statistically significant relationship in the model is the positive relationship between FC and U.

Segment 3 ANTISOCIAL. This segment is the largest group, more than a third of the players belong to this one (36%). In relation to Schwarz's personal values, the users belong to this segment assess the lowest importance to achievement, universalism, and benevolence. Then, in relation to others players, these users can be identified with fewer concerns for standard success. In the same sense, they do not have as an important goal the welfare of all people and nature, nor the well-being of the people closest to them. Otherwise, they have the lowest levels of SI and FC, in other words; these players have both a low social influence and a weak sense of

belonging to the group, and they perceive that they have inferior conditions for playing online video games. In this segment, the intention to use has a really great impact on the use of online video games, and this intention is strongly explained by both the perception of utility of this use and the facilitating conditions. For these players, the game is important by itself and not due to social factors, such to play with other players.

Segment 4. SOCIAL. This segment is the second largest, is characterized especially by FC. The members of this segment perceive FC above the average. However, it is surprising the strong and negative relationship between FC and the use of online games. The use is explained by BI, and the latter by EE and SI. The respondents also offer the highest level of SI in all segments. From the point of view of personal values, members of segment 4 stand out for providing the greatest importance to benevolence. In short, it is a segment concerned about the environment of their near society (family and friends), as the high levels of benevolence and SI indicate, they intend to play and play. However, even though they have the means to play online, this in itself, does not lead them to play. On the contrary, it makes it difficult. Surely, they prefer to use the means available to them in alternative uses to online video games.

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