Computers in Human Behavior 33 (2014) 119-125

Contents lists available at ScienceDirect

Computers in Human Behavior

journal homepage: www.elsevier.com/locate/comphumbeh

Motivational characteristics of Turkish MMORPG players

Muhterem Dindar*, Yavuz Akbulut

Anadolu University, Faculty of Education, Turkey

ARTICLE INFO

Article history: Available online 11 February 2014

Keywords: Online gaming Virtual reality MMORPG Self-determination Theory

ABSTRACT

Massively Multiplayer Online Role Playing Games (MMORPGs) attract millions of online gamers all over the world. However, very few studies have addressed the nature of participants in these games through a robust theoretical background. Thus, the need for theory-based attempts to understand the characteristics of players in different contexts is urgent. The current study adapted a contemporary scale on gamer motivations with Turkish MMORPG members. Confirmatory factor analyses with 307 Turkish MMORPG players revealed that the scale worked effectively. Furthermore, the proposed factor structure and the structural equation model sheltering the interrelationships among the motivation components were supported with a theoretical background on the Self-determination Theory (SDT). It was observed that Turkish MMORPG players were mostly non-working and young males who demonstrated unique playing patterns. Their playing time was correlated with the level of education, body mass index and age. Advancement in the game, game mechanics and socializing were the leading motivations whereas teamwork has been given less importance. The study also revealed that the autonomy, competence and relatedness needs which are proposed by the SDT are not mutually exclusive components. Findings were discussed followed by implications and suggestions for further studies.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

The access to internet has become widespread since 1990s, which impacted people's working, socializing and entertainment behaviors. The Internet has offered a new multicultural context sheltering different virtual experiences for individuals to interact with each other. How and why people act in these worlds have gained considerable attention in contemporary social studies. Online gaming environments, specifically Massively Multiplayer Online Role Playing Games (MMORPGs) constitute a curious type of these worlds where individuals spend a significant amount of their time.

MMORPGs are online games where players can create and control their own avatars to play with others either as allies or competitors in 3D graphical video environments (Steinkuehler & Williams, 2006). Competition, collaboration and social ability carry the utmost importance in MMORPGs (Christou, Law, Zaphiris, & Ang, 2013). In addition, players can create new virtual worlds and objects (Peterson, 2012) in addition to their unique personal stories (Wang, Yang, & Kuo, 2012). Like other online games, MMORPGs provide access to gaming features and ample

E-mail address: mdindar@anadolu.edu.tr (M. Dindar).

opportunities to get in touch with others (Williams, Yee, & Caplan, 2008). Players can also communicate through texting or audio messaging, which enriches the gaming experience with social interactions (Chen & Duh, 2007). Thus, it can be suggested that these games provide strong social bonds and positive feelings among their members (Yee, 2006).

In order to depict the mainstream gamer profiles and to interpret the gaming behaviors of MMORPG players, player demographics have been investigated in several studies. Findings revealed that the average age of gamers ranged from 24.77 through 31.16 (Griffiths, Davies, & Chappell, 2004; Qian, 2010; Williams et al., 2008; Yee, 2006). These findings suggest that contrary to general expectation, the majority of players were not adolescents. That is, playing MMORPGs were widespread among adults as well. The findings further suggested that adults spent more time in MMORPGs than adolescents. Furthermore, differences among the players in terms of gender were obvious. More specifically, the ratio of females to males in these environments was below 20%, which reveals that MMORPGs are generally male-dominated (Griffiths et al., 2004; Williams et al., 2008; Yee, 2006). On the other hand, some studies revealed that females spend more time in MMORPGS than males (Hussain & Griffiths, 2008). The average playing time in MMORPGs was substantial, which ranged from 22.1 through 25.8 h per week (Williams et al., 2008; Yee, 2006). Moreover, players were reported to be more educated than the general population, and their physical health status were not







^{*} Corresponding author. Address: Department of Computer Education & Instructional Technology, Anadolu University, 26470 Eskisehir, Turkey. Tel.: +90 (222) 335 0580x3456; fax: +90 (222) 335 0573.

worse than the national averages (Griffiths et al., 2004; Yee, 2006). All these studies resort to American samples in general. A different profile has been suggested by Qian (2010) who describes a typical Chinese MMORPG player as a high school student, an IT employee in his twenties or a non-working individual.

Even though the background information regarding MMORPG players has been documented to some extent, few studies examined how MMORPGs can affect or reflect such gamer characteristics. For instance, De Souza, e Silva, and Roazzi (2010) reported higher levels of logical-numerical performance and better scholastic skills among MMORPG players than non-player high school students. Suh, Kim, and Kim (2010) studied the effects of playing MMORPGs on English language education and found that MMORPG playing students had better listening, reading and writing scores than students who only had face-to-face instruction.

In aforementioned studies, the demographics of MMORPG players were mostly gathered from Northern American samples. In this regard, it is necessary to focus on the characteristics of players from different cultural backgrounds where the main language is not English. Moreover, worldwide MMORPGs mostly resort to English as the official language. This may be misleading while interpreting the player demographics. That is, a non-native English speaking gamer can refer to an educated, employed, regularly paid, wealthy or relatively aged player in some contexts. In other words, English use might be a prerequisite to play such games, which is a contaminating variable while interpreting the demographics. Thus, the current study aimed to fill in this gap and addressed gamer characteristics in popular MMORPGs operating in Turkish.

2. Motivations for game play in MMORPGS

One of the leading concerns of MMORPG studies is to identify the motivations of players to engage in such gaming environments. Bartle's (1996) player taxonomy was among the first studies to address player motivations in virtual worlds. He stated four main reasons why people enjoy Multi-User Dungeon (MUDs: ancestors of MMORPGs): To achieve in the game, explore it, socialize with others and even to dominate them. In the study, the players were grouped as achievers, socializers, explorers and killers. Although Bartle's classification was a good effort to understand the gamer motivations, some researchers are skeptic about the validity of his conclusions since they were not validated through empirical works (Griffiths et al., 2004; Williams et al., 2008; Yee, 2007). Among the critics, Griffiths et al. (2004) stated that sociability was the most (24.6%) tempting feature of online games, followed by the opportunity to group together with other players (10.2%), being part of a guild (10%), no ending (10%), assisting novices (6.9%), possibility to play solo (6.5%), using magic (5.7%), engaging in hand to hand combats (5.4%), role playing (5.2%) and player versus player engagements (3.3%).

Through reviewing 16 relevant articles on the topic, Sublette and Mullan (2012) examined consequences of playing MMO games and reported that while addicted or problematic gamers were negatively affected from MMO playing, findings about other gamers are mostly positive. That is, gaming motivations were listed as enjoyment, achievement, friendship, and a sense of community.

Another viewpoint was proposed outside the MMORPG literature, and addressed the attachment to online virtual worlds in the context of Second Life (Zhou, Fang, Vogel, Jin, & Zhang, 2012). The study explained the continuance of intention for Second Life use with two main constructs: Affective commitment and calculative commitment. In the paper, factors promoting affective commitment were listed as perceived utilitarian value, hedonic value, and relational capital. On the other hand, personalization and relational capital were related with the calculative commitment.

An alternative empirical framework was proposed by Yee (2006, 2007). Through considering Bartle's model, Yee aimed to define the motivations for game play in MMORPGs. The framework consisted of three components as achievement, social and immersion. Each component sheltered further sub-components which are reflected in a 39-item scale explaining 60% of the gamer motivations (Yee, 2007). A short summary of these components are presented in Table 1.

The scale developed by Yee was used in a few contexts. For instance, Billeux et al. (2013) applied the scale in Belgium and studied with 690 players to see whether the reported motives in Yee (2007) predicted the actual game behaviors in MMORPGs. Results indicated a relationship between reported motives and actual game behaviors. Findings further suggested that teamwork and competition-related motivations were the best predictors of progression in the game. Additional empirical studies have further implemented the scale which revealed acceptable fit values across different samples (Billeux et al., 2013; Qian, 2010). However, the framework has not been accompanied with a motivational theory yet. Thus, the following section suggests a potential theoretical background for the proposed components.

3. Self determination theory and game motivations

According to the Self-determination Theory (SDT), people pursue goals and relationships that support their need satisfaction (Ryan & Deci, 2000). The theory maintains that there are three basic psychological needs to be fulfilled so that individuals' wellbeing can be sustained. These needs are autonomy, competence and relatedness (Reis, Sheldon, Gable, Roscoe, & Ryan, 2000). Individuals are more likely to be motivated to get engaged in activities when they have freedom to make decisions (autonomy), when they feel a sense of efficacy (competence), and when they are socially connected to others and supported by team-members or peers (relatedness) (Gagné, 2003). There are numerous studies from various disciplines supporting the assumptions of the SDT, which proposes that satisfaction of these needs leads to better performance or achievement outcomes (Benware & Deci, 1984; La Guardia, Ryan, Couchman, & Deci, 2000; Ryan, Stiller, & Lynch, 1994) or higher self-motivation (Baard & Deci, 2004; Grolnick & Rvan. 1989).

Table 1

The main factors and subcomponents of the motivations for play in online games scale (Yee, 2007) (reprinted with permission).

Achievement	Social	Immorsion
Achievement	SUCIDI	IIIIIIersion
Advancement	Socializing	Discovery
Progress, power, accumulation, status	Casual chat, helping others, making friends	Exploration, lore, finding hidden things
<i>Mechanics</i>	<i>Relationship</i>	<i>Role-playing</i>
Numbers, optimization, templating, analysis	Personal, self-disclosure, find and give support	Story line, character history, roles, fantasy
Competition	<i>Teamwork</i>	Customization
Challenging others, provocation, domination	Collaboration, groups, group achievements	Appearances, accessories, style, color schemes
		Escapism Relax, escape from real life, avoid real life problems

The SDT framework can be extended to video-game environments and virtual worlds as well. Players can be regarded as intrinsically motivated to play video games and gather satisfaction from the gaming activities. Besides, autonomy and competence are associated with enjoyment and desire to play further (Przybylski, Ryan, & Rigby, 2009). According to the framework, basic psychological needs are satisfied in several ways in video-game environments. First of all, challenges of the game and goals to be mastered in a certain time span result in the satisfaction of competency. Second, the flexibility of goals, strategies and other opportunities while acting in the game leads to the satisfaction of autonomy. Finally, social means such as online communication and interaction among players sustain the satisfaction of relatedness (Przybylski, Rigby, & Ryan, 2010).

In brief, Yee's framework of online gaming motivations looks congruent with the basic needs approach of the SDT. The main factors in Yee's framework are achievement, social and immersion whose components are provided in Table 1. Components of the achievement are inherently related with the competence needs in the SDT. In addition, components of the social factor consist of motivations similar to the ones proposed in the SDT under the heading of the need for relatedness (Przybylski et al., 2010; Reis et al., 2000). Finally, as stated by Rigby and Ryan (2011), video-game players can form an idealized view of their personalities and have novel experiences which are somehow impossible to find in their real lives. Thus, the immersion component of the Yee's framework can be considered equivalent of the autonomy need in SDT.

As mentioned beforehand, there are only a few studies on MMORPG player characteristics, and -to our knowledge- none have been conducted in Turkey or on a game with a Turkish interface. Moreover, none of previous studies have discussed and empirically confirmed a theoretical basis for the framework of Yee (2007). In this regard, the purpose of the current study was to examine the characteristics and gaming motivations of Turkish MMORPG players, and to examine these characteristics with regard to the SDT. First, the framework suggested by Yee (2007) was assessed with authentic players. Then, a structural equation model

Table 2

Summary of descriptive statistics.

sheltering interrelationships among motivation components was suggested with the current data. Finally, characteristics of Turkish MMORPG players were provided and compared with previous findings.

4. Methods and procedures

4.1. Participants

Managers of two popular Turkish MMORPGs volunteered to contribute to the current study. The language used in both games was Turkish. The official permission from the management facilitated the random sampling. In 2 weeks, about 400 participants responded. The researchers agreed that the number was sufficient for relevant analyses, thus the survey was removed from the web. Even though the participants who responded with a monotonous pattern (i.e., marked 1 or 5 in all responses), who left subcomponents of the scale blank, or who had outlier multivariate normality scores were eliminated, the remaining 307 participants were found sufficient for further analyses of the study (Worthington & Whittaker, 2006). The ratio of females (n = 6) to the total population who indicated their gender (n = 282) was 2.1%. The mean age of the players was 19.36 (SD = 6.789). Participants were also asked to rate their previous academic success out of 100 whose average was 78.20 (SD = 12.46). The average body mass index of gamers was 22.8 (SD = 3.95), a value which was within the normal health limits (National Heart & Blood Institute, 2013). The average of monthly family income was 1502 USD, which was close to the Turkey average. Further details regarding participant characteristics were provided in Table 2.

4.2. Data collection and analysis

"Motivations for Play in Online Games scale" developed by Yee (2007) was used in the study. The scale included ten factors sheltering 39 Likert items (Table 3). Items were translated to Turkish by two experts. Both translations and back translations were reviewed and improved by five scholars in the field of instructional

Education level ($n = 282$)	f	%	Gender (<i>n</i> = 289)	f	%
Primary school student	60	21.28	Male	281	97.23
High school student	111	39.36	Doing sports (<i>n</i> = 282)	o f	%
High school graduate	34	12.06	Never	16	5.67
Undergraduate student	35	12.41	Rarely	42	14.89
Undergraduate degree	21	7.45	Sometimes	77	27.3
Graduate student	4	1.42	Usually	86	30.5
Graduate degree	6	2.13	Always	61	21.63
Playing hours at age groups (<i>n</i> = 259)	Mean/range	SD	Playing hours of different education levels ($n = 259$)	Mean/range	SD
<18 (<i>n</i> = 142)	23.35/94	19.18	Primary school student $(n = 55)$	17.2/94	18.05
18-22 (n = 55)	27.2/74	18.21	Primary school graduate $(n = 11)$	34.73/76	24.59
23-28(n=31)	38.71/118	30.69	High school student ($n = 100$)	27.24/74	18.10
28-35 n = (21)	31.9/70	19.42	High school graduate $(n = 31)$	36.16/102	21.44
>35 (n = 9)	34/66	19.5	Undergraduate student ($n = 32$)	25.38/69	18.017
Course preference ($n = 282$)	ſ	%	Undergraduate degree $(n = 20)$	41.2/118	29.53
Non-numerical courses	89	31.56	Graduate student ($n = 4$)	13.75/20	9.74
Numerical courses	122	43.26	Graduate degree $(n = 6)$	26.17/70	29.43
Fine arts	34	12.06	Play time $(n = 289)$	f	%
Foreign languages	37	13.12	Morning	58	20.07
Work (<i>n</i> = 282)	f	%	Midday	72	24.91
Working	217	76.95	Afternoon	156	53.98
Non-working	89	23.05	Evening	188	65.05
			Night	98	33.91

design and technology. Moreover, experts in the game company reviewed and fine-tuned the items to increase interpretability. A personal information form on gamer characteristics (Table 2) accompanied the scale.

The personal information form and the original scale were approved by the management of the game company, and published through Survey Monkey. Official Facebook and Twitter accounts along with the official forums of the games were used for announcements. Participation was voluntary and no rewards were offered to the respondents. The data collection process lasted 2 weeks, and moderators of the MMORPGs updated the announcements several times a week until the data collection was over. After the bad and missing data were eliminated, the original scale was processed through first- and second-order confirmatory factor analyses (CFA) on LISREL 8.80. A structural equation model was proposed as well. Further parametric tests were conducted with SPSS 21.

5. Results

The CFA was conducted to examine the appropriateness of "Motivations for Play in Online Games scale" (Yee, 2007) for Turkish players. Findings revealed that the Chi-square/df ratio of the scale was 0.84, a value below the threshold of 2.0 to consider the model as acceptable. The Root Mean Square Error of Approximation (RMSEA) was 0.000. The RMSEA was 0.000 by default since

Table 3

Descriptives regarding each component of the scale.

Factors and items	Mean	SD	Standardized coefficient	t Value	Error variance
Advancement (α = 0.581) Leveling up your character as fast as possible Acquiring rare items that most players will never have Becoming powerful. Accumulating resources, items or money How important is it to you to be well-known in the game? Being part of a serious, raid/loot-oriented guild	4.34 4.32 4.58 4.88 4.53 4.24 3.47	0.56 0.91 0.79 0.53 0.76 1.02 1.57	.45 .61 .58 .55 .41 .13	6.86 9.55 8.97 8.58 6.28 1.95	.80 .62 .67 .69 .83 .98
Mechanics ($\alpha = 0.471$) How interested are you in the precise numbers and percentages underlying the game mechanics? How important is it to you that your character is as optimized as possible for their profession/role? How often do you use a character builder or a template to plan out your character's advancement at an early level? Knowing as much about the game mechanics and rules as possible	4.06 3.63 4.51 3.85 4.24	0.65 1.25 0.75 1.16	.26 .41 .20	3.37 5.02 2.60 4.96	.93 .83 .96 .84
<i>Competition</i> ($\alpha = 0.633$) Competing with other players How often do you purposefully try to provoke or irritate other players? Dominating/killing other players Doing things that annoy other players	3.13 4.12 2.06 4.03 2.3	0.87 1.06 1.29 1.20 1.47	.21 .56 .41 .60	2.77 7.00 5.45 7.30	.96 .68 .83 .64
Socializing ($\alpha = 0.724$) Getting to know other players Helping other players Chatting with other players Being part of a friendly, casual guild	3.98 3.79 3.74 3.93 4.46	0.75 1.07 1.04 1.07 0.89	.58 .46 .59 .35	8.60 6.75 8.76 5.08	.66 .79 .65 .88
Relationship ($\alpha = 0.656$) How often do you find yourself having meaningful conversations with other players? How often do you talk to your online friends about your personal issues? How often have your online friends offered you support when you had a real life problem?	3.00 3.93 2.5 2.57	0.96 1.07 1.26 1.39	.53 .37 .41	6.80 5.00 5.52	.71 .86 .83
Teamwork ($\alpha = 0.522$) Would you rather be grouped or soloing? How important is it to you that your character can solo well? How much do you enjoy working with others in a group? Having a self-sufficient character	2.61 3.21 1.64 3.91 1.69	0.63 1.07 0.87 0.96 1.02	.54 .18 .51 .17	5.13 2.19 5.01 2.10	.70 .97 .74 .97
Discovery (α = 0.652) How much do you enjoy exploring the world just for the sake of exploring it? How much do you enjoy finding quests, NPCs or locations that most people do not know about? How much do you enjoy collecting distinctive objects or clothing that have no functional value in the game? Exploring every map or zone in the world	3.36 3.45 3.59 2.91 3.52	0.94 1.26 1.31 1.45 1.35	.50 .44 .32 .51	6.62 5.98 4.31 6.76	.75 .80 .90 .74
Role-playing ($\alpha = 0.612$) Trying out new roles and personalities with your characters Being immersed in a fantasy world How often do you make up stories and histories for your characters? How often do you role-play your character?	2.99 3.69 3.41 2.3 2.58	0.93 1.27 1.30 1.41 1.49	.25 .32 .54 .60	3.35 4.35 7.07 7.59	.94 .90 .71 .64
Customization (α = 0.661) How much time do you spend customizing your character during character creation? How important is it to you that your character's armor/outfit matches in color and style? How important is it to you that your character looks different from other characters?	3.97 3.85 3.84 3.81	0.87 1.16 1.27 1.24	.34 .55 .57	4.57 6.94 7.11	.88 .70 .67
Escapism ($\alpha = 0.527$) How often do you play so you can avoid thinking about some of your real-life problems or worries? How often do you play to relax from the day's work? Escaping from the real world	3.39 3.48 3.93 2.77	0.93 1.31 1.16 1.41	.59 .53 .22	6.53 6.21 2.80	.65 .72 .95
Overall ($\alpha = 0.784$)	3.53	0.38			

* Slightly below the acceptable value.

the Chi-square was smaller than df, which indicated a perfect fit. Only one item had a marginal *t*-value (i.e., 1.95), which was slightly below the critical significance level of 0.05 (i.e., 1.96). Other items had t values with significance levels of 0.01 or better. According to Kline (2005), Tabachnick and Fidell (2007), Browne and Cudeck (1993) further fit indices were very good as well (Comparative Fit Index, CFI = 1.000; Incremental Fit Index, IFI = 1.09; Goodness of Fit Index, GFI = 0.92; Adjusted Goodness of Fit Index, AGFI = 0.90, Standardized Root Mean Square Residual, SRMR = 0.056). The item with the marginally non-significant *t*-value was not deleted from the model, since the overall fit was very good. Moreover, the item may work better in other samples. So, the original constructs were preserved. Descriptive statistics regarding each component and item were provided in Table 3.

A second-order CFA was conducted to see whether the main factors and sub-components proposed by Yee (2007) are valid in the current sample (see Table 1 for details). The goodness of fit statistics revealed that the proposed structure was confirmed (Chi-square/df = .88; RMSEA = .000; CFI = 1.00; IFI = 1.09; GFI = .91; AGFI = .90; SRMR = .059). However, the *t*-values of the teamwork (1.50) and competition (1.82) were slightly problematic. The correlation matrix of the scale components are displayed in Table 4.

Based on the relationships observed among the components of the scale, a path diagram was proposed to highlight the interrelations among components (Fig. 1). The analysis produced ideal fit indices (Chi-square/df = .88; RMSEA = .000; CFI = 1.00; IFI = 1.08; GFI = .91; AGFI = .90; SRMR = .061) and all paths had significance values above the 0.05 threshold.

Averages of all scale components were compared with each other through one-way repeated-measures ANOVA. The test showed that the averages differed from each other significantly (Wilks' Lambda = 0.132; F = 217.773; p < .001; eta squared = .868). Pairwise comparisons were conducted through the Bonferroni Procedure to eliminate the risk of committing a Type I Error. In Table 5, all components were listed from the highest to the lowest one. Note that all reported differences were significant at a *p*-value of 0.001 or below.

Further parametric tests were utilized to better describe the Turkish MMORPG players. Since the majority of the participants were males, robust parametric comparisons between males and females could not be conducted. The average playing time of all respondents (27.07 h/week; SD: 21.18) was above the maximum value of 25.8 h observed in the literature (Williams et al., 2008). However, the difference was not statistically significant (t_{258} = .965; p = .336). Similarly, the mean age of the participants (i.e., 19.36) was compared with the minimum mean age observed in the literature (i.e. 24.77) (Qian, 2010). The analysis revealed a t value of -13.350 with a corresponding significance below 0.001, which indicated that the Turkish sample was significantly younger than any other study in the literature.

To see whether there was any relationship between scholastic characteristics and participants' gaming habits as observed in the literature (De Souza et al., 2010; Suh et al., 2010), course type preferences of players were examined as well. However, participants' preferred course types did not predict the playing time ($F_{3,255} = 1.290$; p > 0.05). On the other hand, playing time differed with regard to different age groups ($F_{(4,253)} = 4130$; p < 0.05; eta

Table 4

Correlations among the factors of the Motivations of Game Play scale.

	Game mechanics	Competition	Socializing	Relationship	Teamwork	Discovery	Role-play	Customization	Escapism
Advancement Game mechanics Competition Socializing Relationship Teamwork Discovery Role-play Customization	0.230***	0.335*** 0.094	0.080 0.218 0.046	0.043 0.143* 0.160** 0.423***	-0.211*** -0.084 -0.045 0.161 0.074	0.023 0.258 0.160 0.210 0.172 -0.097	0.296 0.142 0.228 0.178 0.278 -0.069 0.285	0.214*** 0.246*** 0.034 0.082 0.115* -0.084 0.309*** 0.197**	0.225 0.076 0.278 0.092 0.134 -0.074 0.191 0.371 0.161

* Correlation is significant at 0.05.

** Correlation is significant at 0.01.

^{***} Correlation is significant at 0.001.





* p<0.05; ** p<0.01

Fig. 1. Proposed structural equation model regarding the motivations of play in MMORPGs.

Table 5

Comparisons among the components of the scale.

	Component	x	SD	Significantly different from
1	Advancement	4.336	0.560	2, 3, 4, 5, 6, 7, 8, 9, 10
2	Mechanics	4.057	0.647	1, 3, 5, 6, 7, 8, 10
3	Socializing	3.977	0.754	1, 2, 4, 6, 9, 10
4	Customization	3.970	0.871	1, 3, 5, 6, 7, 8, 10
5	Escapism	3.393	0.930	1, 2, 4, 6, 7, 9, 10
6	Discovery	3.364	0.941	1, 2, 3, 4, 5, 7, 8, 9, 10
7	Competition	3.128	0.870	1, 2, 4, 5, 6, 8, 9, 10
8	Relationship	3.001	0.959	1, 2, 4, 6, 7, 9, 10
9	Role-playing	2.996	0.932	1, 3, 5, 6, 7, 8, 10
10	Teamwork	2.614	0.629	1, 2, 3, 4, 5, 6, 8, 9

squared = .061), which indicated that as the age increased, playing time increased as well. The correlation of .217 between the playing time and age (p < .001) confirmed this assumption as well.

Employment was a critical variable to predict playing time. A significant difference in terms of playing time was found between workers and non-workers ($t_{257} = -3.487$; p < 0.001; eta squared = 0.045). Workers spent more time (35.16 h/week; SD: 19.88) in MMORPGs than non-workers (24.58 h/week; SD: 20.99). All ten components were examined with regard to the employment variable. The only significant difference was in terms of role-playing ($t_{280} = 3.185$; p < .002; eta squared = 0.035) where non-workers (3.08; SD: .91) had higher averages than workers (2.67; SD: .89).

Relationships among background variables were examined as well. Pearson correlation coefficients are provided in Table 6. Positive and small-to-moderate coefficients were observed between the playing time and other variables including the level of education, body mass index, and age. Moreover, a small but negative correlation between the playing time and the perceived academic success was observed. No significant relations were observed between the playing time and the frequency of doing sports or family income (see Table 6).

None of the scale components were correlated with age, education level, body mass index, income or playing time at a statistically significant level except for the negative relationships between age and advancement (r = -.153; p < .001), education and advancement (r = -.117; p < .05); age and role-playing (r = -.170; p < .001), and education and role-playing (r = -.133; p < .01). These values suggested that as the age and education level increased the importance of advancement and role-playing decreased.

6. Discussion and conclusion

The objectives of the current study were to explore the motivational characteristics of Turkish MMORPG players, to discover

Ta	bl	le	6

Correlations among background variables.

	Academic success	Playing time	Body mass index	Age	Doing sports	Income
Education level	202**	.192**	.256***	.617***	119**	.011
Academic success		154*	175**	167**	.199**	.136*
Playing time			.174**	.217	045	.042
Body mass index				.392***	157**	.096
Age Doing sports					237***	052 .186
* n < 0.05						

p < 0.05.

p < 0.01.

^{****} *p* < 0.001.

gamer demographics and to validate the framework of Yee (2007) with Turkish participants. Although virtual worlds, online gaming environments and particularly MMORPGs were addressed in several empirical studies, characteristics of MMORPG players are yet to be discovered. The current study can fill in this gap through describing the current status of Turkish MMORPG players through a well-known theoretical framework. That is, the current study can be among the preliminary attempts to accompany MMORPG play-ers' motivational characteristics with a motivational theory (i.e. SDT).

The current study retained the factor structure proposed by Yee (2007) through acceptable or perfect fit indices. In the first-order confirmation, a marginally significant value was observed in only one item, which could be rewritten in further implementations to improve the scale. The second-order structure was also confirmed which validated both the main factors and sub-components proposed by Yee (2007). Since the proposed structure is valid with Turkish players, matching MMORPG play motivations with the SDT assumptions in further theoretical and empirical studies can be plausible. That is, basic psychological needs in the SDT (i.e. autonomy, competence, relatedness) can correspond with gaming motivations proposed by Yee (2007) (i.e. immersion, achievement, social).

According to the SDT, basic needs should be provided in full for the integrity and well-being of individuals (Deci & Ryan, 1991). Even though these motivational needs are summarized in previous works (Przybylski et al., 2009, 2010), interrelationships among these motivations in video-gaming environments have not been described yet. Thus, the results of the current path analysis can guide further empirical works to scrutinize the interrelationships among these basic needs. According to the proposed path diagram in Fig. 1, the autonomy (i.e. discovery, role-playing, customization and escapism), competence (i.e., advancement, mechanics, competition) and relatedness (i.e., socializing, relationship, teamwork) needs are not mutually exclusive. Individuals are motivated to discover the gaming environment in order to socialize with others. To discover this environment, they need to focus on the game mechanics. Thus, a need of relatedness directs gamers to satisfy an autonomy need. Such an autonomy need leads the gamer to further satisfy a competence need. Further empirical studies are necessary to elaborate such interrelations among basic needs.

Descriptive statistics regarding each component of the Yee's (2007) framework revealed that almost all components differed from each other significantly. Among the components, advancement had the utmost importance whereas teamwork had a very low average. This reveals that Turkish players admire leveling up, but undermine the importance of the teamwork in MMORPG environments. Three components with the lowest averages (i.e. relationship, role-playing, teamwork) can either reveal that Turkish players are yet to discover the importance of group dynamics in MMORPGs, or suggest that the current playing context does not require gamers to employ grouping skills to advance in the game. Such arguments should be questioned with further studies to be validated.

The playing time of Turkish MMORPG players was similar to that of previous studies (Griffiths et al., 2004; Qian, 2010; Williams et al., 2008; Yee, 2006). The age and education level were significant predictors of the time spent in these environments. That is, as the age and the education of the players increased, the playing time increased as well. Age and education level further predicted the importance of advancement and role-playing. More specifically, it seems that the maturity of the participants attenuated the importance of advancement and role-playing.

The mean age of 19.3 in the current study was significantly younger than any other sample in the literature. Turkish MMORPG players resembled the Chinese profile reported by Qian (2010)

since the current sample consisted of adolescents the most. Turkish players were mostly male, primary or high school students from middle class families. The male-domination was parallel with the previous literature as well (Griffiths et al., 2004; Qian, 2010; Williams et al., 2008; Yee, 2006). However, the percentage of women in the current sample was far below that of previous studies; which should be addressed through further empirical attempts to maintain that the proportion was consistent across new samples.

The majority of the participants were still students and only 23% were employed. Employment rate was below the 50% threshold reported in Yee's (2006) findings. The number of employed participants was sufficient to conduct further parametric tests, which revealed that workers spent significantly more time in MMORPGs than non-workers. This difference could be due to the surveillance employed by the parents. Independent individuals can spend more time with MMORPGs whereas students under parental control cannot have that much freedom. On the other hand, non-workers had higher averages than workers in terms of the component of roleplaying. However, further partial analyses suggested that this difference stemmed from the relationship between age and employment status. Qualitative investigations are necessary to claim that there really were significant differences between the motivations of workers and non-workers. For the time being, it seems that workers and non-workers demonstrate different playing times but similar gaming motivations.

To our knowledge, the current study was the first empirical attempt to understand the nature of Turkish MMORPG players. Yee's (2007) scale worked very well with Turkish players. Although the current sample was quite younger, the motives that kept them in MMORPGs were same with other players around the world. Additional data collection instruments should be implemented and interrelationships between playing motivations and further variables should be investigated in future studies. Such studies on MMORPGs can help scholars to better understand the gamer characteristics and behaviors in different contexts and cultures.

The current study poses several limitations. For instance, the inferences are merely based on two specific Turkish MMORPGs. There are several other MMORPGs in Turkey, both with Turkish and English interfaces. In this regard, further studies on different MMORPGS are necessary to understand better the motivational characteristics of Turkish gamers. Besides, the dominance of the self-report in the current data implies that the response bias can be on stage. Thus, additional data to depict actual gaming behaviors can be collected through tracking tools, and accompanied with the current model. On the other hand, the current study contributes to the MMORPG literature, since it is one of the first serious attempts to describe Turkish MMORPG players. An important implication of the study is that scholars and game producers should consider the young age and male-dominance among Turkish players while setting up their design interventions. Furthermore, interrelationships provided in the current path analysis may help scholars to create subsequent models so that they can describe gamers' motivational characteristics in depth. Finally, future investigations on game motivations can be supported through the theoretical background on the SDT.

References

- Baard, P. P., & Deci, E. L. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, 34, 2045–2068.
- Bartle, R. (1996). Hearts, clubs, diamonds, spades: Players who suit MUDs. The Journal of Virtual Environments, 1.
- Benware, C., & Deci, E. L. (1984). Quality of learning with an active versus passive motivational set. American Educational Research Journal, 21, 755–765.
- Billeux, J., Van der Linden, M., Achab, S., Khazaal, Y., Paraskevopoulos, L., Zullino, D., et al. (2013). Why do you play World of Warcraft? An in-depth exploration of

self-reported motivations to play online and in-game behaviours in the virtual world of Azeroth. *Computers in Human Behaviors*, 29, 103–109.

- Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage Publications.
- Chen, V.H., & Duh, H.B. (2007). Understanding social interaction in World of Warcraft. International conference on advances in computer entertainment technology 2007 proceedings (pp. 21–24).
- Christou, G., Law, E. L-C., Zaphiris, P., & Ang, C. S. (2013). Challenges of designing for sociability to enhance player experience in massively multi-player online roleplaying games. *Behaviour & Information Technology*, 1–11.
- De Souza, B. B., e Silva, L. X., & Roazzi, A. (2010). MMORPGS and cognitive performance: A study with 1280 Brazilian high school students. *Computers in Human Behavior*, 26(6), 1564–1573.
- Deci, E., & Ryan, R. (1991). A motivational approach to self: Integration in personality. In R. Dienstbier (Ed.), *Nebraska Symposium on Motivation*. Lincoln: University of Nebraska Press. Vol. 38.
- Gagné, M. (2003). The role of autonomy support and autonomy orientation in prosocial behavior engagement. *Motivation and Emotion*, 27(3), 199– 223.
- Griffiths, M. D., Davies, M. N. O., & Chappell, D. (2004). Demographic factors and playing variables in online computer gaming. *Cyber Psychology and Behavior*, 7(4), 479–487.
- Grolnick, W. S., & Ryan, R. M. (1989). Parent styles associated with children's selfregulation and competence in school. *Journal of Educational Psychology*, 81, 143–154.
- Hussain, Z., & Griffiths, M. D. (2008). Gender swapping and socializing in cyberspace: An exploratory study. *CyberPsychology & Behavior*, 11(1), 47–53.
- Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York: The Guilford Press.
- La Guardia, J. G., Ryan, R. M., Couchman, C. E., & Deci, E. L. (2000). Within-person variation in security of attachment: A self-determination theory perspective on attachment, need fulfillment, and well-being. *Journal of Personality and Social Psychology*, 79, 367–384.
- National Heart, Lung, Blood Institute (2013). Calculate your body mass index. http://www.nhlbi.nih.gov/guidelines/obesity/BMI/bmicalc.htm> (Accessed 29. 05.2013).
- Peterson, M. (2012). Learner interaction in massively multiplayer online role playing game (MMORPG): A sociocultural discourse analysis. *ReCALL*, 24(3), 361–380.
- Przybylski, A. K., Rigby, C. S., & Ryan, R. M. (2010). A motivational model of video game engagement. *Review of General Psychology*, 14(2), 154–166.
- Przybylski, A. K., Ryan, R. M., & Rigby, C. S. (2009). The motivating role of violence in video games. *Personality and Social Psychology Bulletin*, 35, 243–259.
- Qian, G. (2010). Psychological perspectives on social behaviors of Chinese MMORPG players. In X. Zhang et al. (Eds.), LNCS 6249 (pp. 192–202). Berlin Heidelberg: Springer-Verlag.
- Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily wellbeing: The role of autonomy, competence and relatedness. *Personality and Social Psychology Bulletin*, 26, 419–435.
- Rigby, C. S., & Ryan, R. M. (2011). *Clued to games: How video games draw us in and hold us spellbound*. Santa Barbara, CA: Praeger.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Ryan, R. M., Stiller, J., & Lynch, J. H. (1994). Representations of relationships to teachers, parents, and friends as predictors of academic motivation and selfesteem. *Journal of Early Adolescence*, 14, 226–249.
- Steinkuehler, C., & Williams, D. (2006). Where everybody knows your (screen) name: Online games as 'third laces'. *Journal of Computer-Mediated Communication*, 11(4), 885–909.
- Sublette, V. A., & Mullan, B. (2012). Consequences of play: A systematic review of the effects of online gaming. *International Journal of Mental Health and Addiction*, 10(1), 3–23.
- Suh, S., Kim, S. W., & Kim, N. J. (2010). Effectiveness of MMORPG-based instruction in elementary English education in Korea. *Journal of Computer Assisted Learning*, 26, 370–378.
- Tabachnick, B. G., & Fidell, L. S. (2007). Using multivariate statistics (5th ed.). Boston: Pearson.
- Wang, S. T., Yang, C. J., & Kuo, W. C. (2012). The clusters of gaming behavior in MMORPG: A case study in Taiwan. IIAI International Conference on Advanced Applied Informatics Proceedings, 264–266.
- Williams, D., Yee, N., & Caplan, S. (2008). Who plays, how much, and why? A behavioral player census of virtual World. *Journal of Computer Mediated Communication*, 13, 993–1018.
- Worthington, R. L., & Whittaker, T. A. (2006). Scale development research: A content analysis and recommendations for best practices. *The Counseling Psychologist*, 34, 806–838.
- Yee, N. (2006). The Demographics, motivations and derived experiences of users of massively-multiuser online graphical environments. *PRESENCE: Tele-operators* and Virtual Environments, 15, 309–329.
- Yee, N. (2007). Motivations for play in online games. *Cyberpsychology and Behavior*, 9, 772–775.
- Zhou, Z., Fang, Y., Vogel, D., Jin, X., & Zhang, X. (2012). Attracted to or locked in? Predicting continuance intention in social virtual world services. *Journal of Management Information Systems*, 29, 267–300.