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Role of self-efficacy and social appearance anxiety on gaming motivations of MMOFPS players

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ABSTRACT

This study investigated the gamer characteristics and motivations among the members of two massively multiplayer online first person shooting games (MMOFPS). Responses of 5380 gamers were obtained through online administration of several measures on personal information, gaming motivations, social appearance anxiety, and self-efficacy. A structural equation model was proposed and confirmed in both games, which revealed that academic self-efficacy and general self-efficacy were highly related both of which predicted socialization, immersion and achievement motivations. Furthermore, social appearance anxiety influenced achievement motivations through the help of immersion. All motivation types were positively related. Additional analyses revealed statistically significant differences in playing time with regard to age and education, whereas the practical significance of these analyses required further research.

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1. Introduction

Massively Multiplayer Online Games (MMOG) are among the prominent virtual worlds where players spend significant amounts of their time to play, compete, and socialize with others around the virtual world (Williams, Yee, & Caplan, 2008). There are several types of MMOGS among which Massively Multiplayer Online Role-Playing Games (MMORPG) and Massively Multiplayer Online First Person Shooter Games (MMOFPSs) are quite popular. In MMOGs, users delve into an ongoing scenario along with a customizable territory where they play with or against other human-controlled characters. In addition, they create personal or collective stories to advance in the game. Characteristics of MMOG players have been among the popular research trends regarding contemporary gaming contexts. Majority of such research focused particularly on the MMORPG genre, in which players create stories for their avatars through socializing with the avatars of others while advancing in the game. Relevant works on MMORPGs investigated gamer profiles (Dindar & Akbulut, 2014; Griffiths, Davies, & Chappel, 2004; Qian, 2010; Williams et al., 2008), gamer motivations (Dindar & Akbulut, 2014; Billeux et al., 2013; Yee, Ducheneaut, & Nelson, 2012), psychological well-being of gamers (Caplan, Williams, & Yee, 2009; Sublette & Mullan, 2012), and consequences of MMORPG play in players' daily lives (Hart et al., 2009; Lo, Wang, & Fang, 2005; Smyth, 2007). However, very few studies focused on the MMOFPSs despite its popularity among the MMOG genres (Jansz & Tanis, 2007).

MMOFPSs have the features of both online browser games and first-person shooter (FPS) games. The term 'browser game' has been coined for online games that use the infrastructure of internet browsers, which enables them to operate on any internet connected device. No specific game console or a computer with the game DVD is required to run a browser game. Instead, gamers just need to download the game interface. Another distinctive feature of MMOFPSs that has been inherited from FPSs is that players combat against other human-controlled characters with a variety of weapons and ammunitions. The wars in such gaming environments contain high levels of violence and blood. Planet Side 2, Combat Arms, Black Light and Crossfire games can be considered as popular examples of the MMOFPS genre.

Antecedents and consequences of MMOFPS gaming are somewhat unclear due to the scarcity of relevant empirical studies. Although not much is known about MMOFPS player characteristics, the literature on violent games and online gaming in the next section can shed light

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on the issue. The following section reviews relevant literature on online and violent games through addressing individual variables. This concise review is followed by a verified theoretical framework on motivations of play. Then, target variables of the current study were introduced along with relevant rationales and hypotheses.

2. Review of the literature

A group of scholars in the empirical gaming literature have focused on the psychological well-being of gamers and observed no association between gaming and psychological well-being. For instance, Olson (2010) did not observe any pathological symptoms among FPS players. Similarly, Homer, Hayward, Frye, and Plass (2012) investigated the gaming behaviors and psychological adjustments of pre-adolescents. The study revealed that children who played violent games were not depressed, inattentive, or aggressive which was contrary to tendencies observed in the video game literature (DeLisi, Vaughn, Gentile, Anderson, & Shook, 2013; Engelhardt, Bartholow, & Saults, 2011; Ferguson, Miguel, Garza, & Jerabeck, 2012). That is, participants of the gamers reflected similar psychological adjustments with non-players (Homer et al., 2012). Moreover, gamers were even less likely to have depression and anxiety than other non-player adolescents. These adjustments were reliably measured through the Behavior Assessment System for Children – Second Edition Self-Report of Personality (BASC-II).

There are also studies questioning whether MMOG play can be socially advantageous. In this regard, Ko, Yen, Chen, Chen, and Yen (2005) and Yee (2006) reported positive reflections of MMOG play such as increased level of social interaction. Trepte, Reinecke, and Juechems (2012) also maintained that online gaming provided players with better social ties, which extended to real life activities. On the other hand, Hart et al. (2009) found no relationship between excessive online gaming and social life characteristics. Similarly, Dupuis and Ramsey (2011) reported that involvement in MMORPGs was not associated with low perceived social support in daily life.

Contrary to aforementioned literature, several works implied negative and serious consequences of online gaming in daily life. Some of these works blamed online gaming contexts for decreasing relationship quality in real life (Charlie, HyeKyung, & Khoo, 2011; Lo et al., 2005; Shen & Williams, 2011), while some maintained a relationship between online gaming and decreased perceived social support (Mitchell, Lebow, Uribe, Grathouse, & Shoger, 2011) or lower social competence (Lemmens, Valkenburg, & Peter, 2011; Lo et al., 2005). Considering such contradictory findings in the literature, Sublette and Mullan (2012) concluded that findings regarding the effects of MMOGs on psychosocial well-being of players were quite inconclusive.

The relationship between online gaming and academic success has been investigated as well. Findings were quite contradictory as some studies suggested a negative influence on academic performance whereas some maintained the opposite. In Smyth's (2007) study, MMORPG players reported that game play interfered with their academic and occupational performance. However, no statistical relationship was found between the game play and low performance. The significant negative relationship between academic success and online gaming was observed in further studies (Anand, 2007; Skoric, Teo, & Neo, 2009). Similarly, excessive playing was reported as an antecedent of the loss of job (Chappell, Eatough, Davies, & Griffiths, 2006; Kim, Namkoong, Ku, & Kim, 2008). On the other hand, Hart et al. (2009) studied Spanish MMORPG players and observed no relationship between game play and academic performance. There are also studies maintaining positive academic outcomes of online gaming. For instance, De Souza, e Silva, and Roazzi (2010) found that MMORPG players had higher levels of logical–numerical performance and better scholastic performance than non-players.

Some of the empirical studies in the literature investigated the relationship between personality traits and online gaming behaviors in violent games. In this respect, Chory and Goodboy (2011) investigated the relationship between personality traits and the frequency of violent game play. They reported that players with higher openness and lower agreeableness scores were playing violent games more often. The study further revealed a relationship between personality traits and video game preferences. That is, individuals with more open but less agreeable and neurotic traits were more prone to play violent games. Similarly, Przybylski, Ryan, and Rigby (2009) investigated the violent game preference and personality traits through a Self Determination Theory (SDT) perspective. Their findings suggested that violent games do not add extra enjoyment to the gaming pleasure since violence is not related to the basic psychological needs (e.g., autonomy, relatedness and competence) of players. However, individuals with higher aggression traits were found more likely to prefer violent games although violence itself did not increase the game enjoyment. Finally, Park, Song, and Teng (2011) addressed the relationship between personality traits and playing online games. They classified several types of gaming purposes which were predicted by extraversion and agreeableness. However, no link could be built between personality traits and playing time or game genre preferences.

In brief, studies in the gaming literature sought for the influence of several predictors on gaming behaviors such as psychological well-being, social skills, academic performance and personality traits. Most of these studies resorted to surveys followed by preliminary descriptive analyses or inferential statistics except for rare structural equation models (e.g., Dindar & Akbulut, 2014; Dupuis & Ramsey, 2011). As briefly discussed, the findings are somewhat inconclusive.

2.1. Motivations of play

A considerable volume of empirical studies delved into the types and predictors of gamer motivations (Dindar & Akbulut, 2014). Some of the aforementioned studies also addressed motivational variables like enjoyment (e.g., Przybylski et al., 2009); however, a verified taxonomy of gaming motivations was not followed. Bartle's taxonomy of players was one of the first studies investigating the gamer motivations in multi-user games. Bartle (1996) explained the main motivations of multi-user games as achievement, exploration, socializing, and imposition upon others. Following this preliminary framework, Yee (2007) developed a valid and reliable scale to measure the MMOG motivations. The scale revealed that achievement, socialization and immersion were the leading motivations to participate in MMOGs. Yee's framework was confirmed in different contexts (Dindar & Akbulut, 2014; Billeux et al., 2013; Williams et al., 2008). In a further cross-cultural study, Yee et al. (2012) confirmed these motivations and maintained that socialization was the prominent motivation among the gamers, which was followed by immersion and achievement. The study also investigated gamer motivations with regard to gender, which revealed that males had higher achievement motivations whereas females had higher immersion and socialization motivations.

Jansz and Tanis (2007) also investigated the FPS motivations through a perspective on uses and gratifications theory (Rosengren, 1974; Rubin, 2002; Ruggiero, 2000). They listed the main motivations of play as enjoyment, competition, interest, fantasy, social interaction,

challenge and excitement. The study concluded that social interaction, interest and competition were the only predictors of time spent in the FPS games. These three predictors seemed to be congruent with the motivations proposed by Yee et al. (2012) (i.e., socialization, immersion, achievement).

As indicated above, online gaming was investigated through several perspectives. However, a general understanding is yet to be reached in most of these areas. As Sublette and Mullan (2012) stated, further studies are needed to have a clearer vision of how online gaming effects gamers' lives or how personal characteristics influences involvement in online gaming.

3. Research rationale and hypotheses

The purpose of the current exploratory study was to investigate the gamer profiles and playing motivations of MMOFPS players. Since it is somewhat difficult and rare to reach real MMOFPS players, there is not sufficient empirical work exploring these worlds in particular. The only study in a similar research context was conducted by Jansz and Tanis (2007) with 5751 FPS players (i.e., Counter Strike). The study reported the mean age of players (i.e., 18), the average time spent on gaming (i.e., 2.6 h/day) and the fact that the majority of gamers preferred to play in groups rather than in isolation. That is, except for the inferences from similar virtual worlds, there is not any further study addressing the gamer characteristics in MMOFPS settings in particular.

The main latent variables addressed in the current research were motivations of play, social appearance anxiety, general self-efficacy and academic self-efficacy. Gaming motivations were the dependent variable, which were investigated through the verified framework mentioned above (Yee et al., 2012).

The next variable of interest was social appearance anxiety, which is the fear of having a negative physical image on others around one's self (Hart et al., 2008). The literature suggests that social appearance anxiety has negative effects on the social, academic and professional well-being of individuals (Cash & Fleming, 2002; Coles et al., 2006; Holsen, Kraft, & Roysamb, 2001; Safren, Heimberg, Brown, & Holle, 1997). Findings further indicate that individuals with high social appearance anxiety were afraid of social interaction with others, and of being scrutinized and evaluated negatively (Levinson & Rodebaugh, 2011). We hypothesized that social appearance anxiety can be related to motivations of play since one of the biggest affordances of MMOGs is the ability to customize the personal avatars in the games. That is, players are able to manipulate their race, gender, clothing, look and other characteristics related to virtual presence in the game. Therefore, individuals who are not comfortable with their physical appearance may be more motivated to participate in MMOGs to try out new characters with “better” appearances. Yee (2007) defined this situation as escapism, which is a subcomponent of immersion in online games. Besides, Toma and Hancock (2010) stated that physical appearance of individuals was related to how they represented themselves in virtual worlds. Thus, we particularly expected a significant relationship between social appearance anxiety and immersion in MMOFPS environments.

We further hypothesized that self-efficacy could be related with gamer motivations. Based on Bandura's (1997) Social Cognitive Theory, general self-efficacy refers to how much an individual is optimistic about coping with a variety of stress sources (Schwarzer, Mueller, & Greenglass, 1999). Bandura (1997) stated that self-efficacy had a significant influence on individuals' feelings, thoughts and actions. That is, while low self-efficacy is regarded as a predecessor of depression, anxiety and pessimistic thoughts; high self-efficacy motivates people to get involved in more challenging tasks. Previous research further suggests that self-efficacy has a positive impact on the motivation and performance regardless of the domain (Schunk, 1995). Although several studies investigated various “real” life social skills and gaming behaviors of individuals (Sublette & Mullan, 2012), no research has focused on the relationship between “real” life self-efficacy and online gaming motivations. General self-efficacy may lead to higher motivation in online games due to new challenges offered in the environment or users might be preferring online games to compensate for their unfulfilled self-efficacy (Williams et al., 2008) in their real lives. In this regard, retaining the relationship between self-efficacy and gaming motivations could be quite interesting to decipher such probabilities.

A specific type of self-efficacy, i.e., academic self-efficacy and its relation to gaming motivations was the next concern of the current study. Academic self-efficacy can be defined as the one's belief about the level of competency in dealing with academic tasks (Odacı, 2011). Williams et al. (2008) argued that MMOG members might be playing these games to compensate their lack of achievement in their “real” lives. However, as mentioned beforehand, studies on the relationship between gaming and real life performance are still inconclusive with negative (Anand, 2007; Skoric et al., 2009), neutral (Hart et al., 2009) and positive implications (De Souza et al., 2010). Thus, testing current arguments with large scale implementations and investigating the relationship between academic self-efficacy and gaming behaviors were considered plausible and contributive to the literature.

Previous studies reported that players of MMOFPs were generally young males at high school ages (Jansz & Tanis, 2007). Dindar and Akbulut (2014) also confirmed that Turkish MMORPG players were younger than other gamer populations in the world (Williams et al., 2008; Yee, 2007). Thus, questioning the relationship between academic self-efficacy and gamer profiles may also create educational implications since the majority of participants are expected to be students because of the compulsory schooling in young ages.

In brief, no previous study has attempted to examine the gamer profiles in MMOFPS contexts with regard to the current variables of interest. Furthermore, studies with large samples are needed to understand who the MMOFPS players are. Hence, another objective of the current study was to reach and explore a significant volume of players to get an understanding of these worlds.

4. Methods and procedures

4.1. Research context and participants

Participants were the players of two famous MMOFPSs owned by a private gaming company in Turkey. Both games reflected usual characteristics of FPSs, where players fight against each other through choosing their avatars as either security officers or outlaws. They are also allowed to create clans to fight together with persistent group members. In addition, they encounter stronger enemies as they advance in the game. Although both games are free, gamers can buy weapons, outfits, powers and other game related features to impose upon their enemies in the game. Combats occur on various 3D maps and the primary purpose is to control the territory through killing opponent avatars. Communication among players is realized through synchronous voice chat and instant messaging. Players can customize their

characters or choose weapons from the inventory depending on their ranks and assets in the game. Games occur in rounds and winner in the majority of the rounds is announced as the winner. Team members also get extra credits for the number of opponents they personally defeat. The two games were alike except for the appearances of the characters and slight modifications in game scenarios.

The company granted official permission to collect data from their players, and advertised the study through the announcements on official Facebook and Twitter pages. All respondents were Turkish citizens since both interfaces were available only in Turkish. A total of 5380 valid responses were obtained. The majority of the players (>98.5%) were males. The mean age of players was 16.14 (SD: 4.20) in Game 1, and 15.77 (SD: 3.99) in Game 2. Further details regarding the profile of participants are presented in Table 1.

4.2. Measures

Participants were provided with a background questionnaire which addressed several variables including age, gender, education, playing hours per week and working status. In addition to the background questionnaire, following standardized measures were used to collect data. To our knowledge, most of these measures are used in the current gaming setting for the first time. Thus, confirmation of their factor structures in the current study may contribute to further research in similar contexts.

4.2.1. Online Gaming Motivations Questionnaire

Online Gaming Motivations Questionnaire is a 12-item Likert scale developed by Yee et al. (2012). Three factors are sheltered in the scale, which are achievement, social and immersion. Responses to statements range from "not important at all (1)" through "extremely important

Table 1
Demographics of MMOFPS players.

Education	Game 1		Game 2		Overall	
	f	%	*f*	%	*f*	%
Primary school student	296	26.76	1278	29.90	1574	29.30
Primary school graduate	126	11.39	540	12.63	666	12.40
High school student	500	45.21	1915	44.81	2415	44.90
High school graduate	67	6.06	246	5.76	313	5.80
Undergraduate student	73	6.60	135	3.16	208	3.90
Undergraduate degree	19	1.72	70	1.64	89	1.70
Graduate student	6	0.54	11	0.26	17	0.30
Graduate degree	19	1.72	79	1.85	98	1.80
Total	1106		4274		5380	
	Game 1		Game 2		Overall	
	Mean	SD	Mean	SD	Mean	SD
Playing hours by age						
<14	18.37	21.59	14.71	18.01	15.42	18.81
14–18	16.78	18.86	19.11	20.94	18.66	20.57
19–23	25.76	26.55	21.68	23.36	22.74	24.26
24–28	25.86	28.12	23.80	22.89	24.29	24.15
>28	33.82	28.45	26.62	26.60	28.10	26.99
Playing hours by education						
Primary school student	17.68	20.76	15.84	19.22	16.18	19.52
Primary school graduate	14.95	17.56	16.32	19.13	16.07	18.85
High school student	17.95	20.35	19.34	20.86	19.06	20.76
High school graduate	21.90	20.37	23.95	24.00	23.51	23.29
Undergraduate student	26.37	27.32	22.38	23.39	23.78	24.84
Undergraduate degree	35.88	33.06	26.88	27.55	28.58	28.67
Graduate student	14.00	6.45	23.70	32.36	20.06	25.80
Graduate degree	30.25	35.56	20.85	23.55	22.69	26.33
	Game 1		Game 2		Overall	
	f	%	*f*	%	*f*	%
Work						
Working	169	15.30	696	16.30	865	16.10
Non-working	937	84.70	3578	83.70	4515	83.90
Total	1106		4274		5380	
Gender						
Female	11	1.00	66	1.50	77	1.40
Male	1095	99.00	4208	98.50	5303	98.60
	Game 1		Game 2		Overall	
	Mean	SD	Mean	SD	Mean	SD
Playing time by gender						
Females	13.08	7.80	18.11	24.95	17.63	23.86
Males	18.89	21.55	18.46	20.76	18.55	20.92
General average	18.85	21.50	18.46	20.82	18.54	20.96
Playing time by working situation						
Working	23.85	24.95	22.04	24.35	22.39	24.21
Non-working	17.95	20.70	17.78	20.09	17.82	20.21

(5)". The questionnaire was translated to Turkish in the current study and reviewed by two language experts. The translation phase was followed by an expert panel with three instructional technology and two language experts to fine-tune the scale for the current context. The final version of the scale was presented to the game company and developers confirmed that the questionnaire involved the relevant terminology for their players. The internal consistency of the adapted version was ideal (Alpha: 0.818).

4.2.2. Social Appearance Anxiety Scale

The Social Appearance Anxiety Scale is a 5-point Likert measure developed by Hart et al. (2008). It has a one-factor structure with 16 items, which address emotional, cognitive and behavioral anxieties regarding physical appearance. Responses regarding anxiety indicators vary between "Not at all (1)" to "Extremely (5)". The scale was found reliable and valid in various administrations (Coles et al., 2006; Levinson & Rodebaugh, 2011) including a recent administration with Turkish university students (Doğan, 2010). The internal consistency coefficient of the current administration was also high (0.933).

4.2.3. General Self-Efficacy Scale

The General Self-Efficacy Scale was generated by Schwarzer and Jerusalem (1995). The one-factor scale shelters ten items and the responses range from "not at all true (1)" to "very true (4)". The scale was validated with a Turkish sample by Yesilay, Schwarzer, and Jerusalem (1996) and its internal consistency in the current implementation was calculated as 0.897.

4.2.4. Academic Self-Efficacy Scale

This 7-item scale was developed by Jerusalem and Schwarzer (1981) and adapted to Turkish by Yılmaz, Gürçay, and Ekici (2007). Responses to the scale ranges from "not at all true (1)" to "very true (4)". The internal consistency of the scale on the current administration was 0.692.

4.3. Data collection and analysis

The online survey was administered through the assistance of a professional web survey company. The survey began with the background questionnaire followed by the standardized measures explained above. Each questionnaire was presented in different pages. Participants were allowed to leave questions unanswered in the background questionnaire. On the other hand, they had to answer all questions in standardized measures to complete the responding. Participants filled in the survey in complete anonymity. Moreover, the data collection interface did not allow repetitive filling of the questionnaires through checking the IP addresses of respondents.

The producers of the games supported the data collection procedure through daily announcements on their official Facebook and Twitter pages. The data from two games were recorded to different databases and merged in the end. Details regarding each dataset are provided in Table 1. Data collection lasted eight days and 5380 valid responses were collected. IBM SPSS Statistics 21 was used for parametric tests (e.g., *t*-test, ANOVA and regression) whereas LISREL 8.80 was used to confirm the measurement model and propose the structural equation.

5. Results

First of all, confirmatory factor analyses (CFA) on current measures were conducted through using the datasets of Game 1 and Game 2 separately, which was followed by a CFA on the combined dataset. This procedure was deliberately preferred to assess whether the current scales were appropriate with the gamer profiles and whether the two games reflected similar measurement models. Fit values are provided in Table 2.

Fit values revealed that the current data collection tools reflected acceptable or perfect measurement models for both games. Only the df to chi-square ratios were beyond acceptable values. However, this deviation did not violate the model fit, since the chi-square is quite sensitive to the sample size (Jöreskog & Sörbom, 1993). In this respect, to check whether the surveys showed ideal fit values in smaller samples, several sets of random data with 290 cases were derived. This number was regarded as plausible since the majority of the relevant literature on CFA suggests sample sizes of 200 or above for reliable results (Kline, 2005; Worthington & Whittaker, 2006). These cases were selected according to the random case numbers generated by www.randomizer.org. The CFAs on these smaller samples revealed perfect χ^2/df values (i.e., below 1.8) in both Game 1 and Game 2. To inform further structural equation models and meta analyses in the field, the correlations among scale factors are also presented in Table 3.

Based on the discussed theoretical framework and correlations provided in Table 3, we proposed a structural equation model to explain the relationships between gaming motivations and characteristics of MMOFPS players. The proposed model illustrated in Fig. 1 yielded acceptable or perfect fit values across the samples (Table 4). Thus, research hypotheses derived from the relevant literature were retained. In

Table 2
Evaluation of the measurement model.

Index	Acceptable	Game 1	Game 2	Overall	Rationale
χ^2	N/A	2831.51	7814.53	9435.02	–
df	N/A	930	930	930	–
χ^2/df	$0 \leq \chi^2/df \leq 3$	3.045[a]	8.403[a]	10.145[a]	Kline (2005), Sumer (2000)
RMSEA	$0 \leq RMSEA \leq 0.08$	0.043	0.042	0.041	Hooper, Coughlan, and Mullen (2008)
SRMR	$0 \leq SRMR \leq 0.10$	0.051	0.049	0.049	Kline (2005)
NFI	$0.90 \leq NFI \leq 1.00$	0.97	0.97	0.98	Thompson (2004)
NNFI	$0.90 \leq NNFI \leq 1.00$	0.98	0.98	0.98	Tabachnick and Fidell (2001)
CFI	$0.90 \leq CFI \leq 1.00$	0.98	0.98	0.98	Tabachnick and Fidell (2001)
GFI	$0.90 \leq GFI \leq 1.00$	0.90	0.92	0.93	Schumacker and Lomax (1996)

[a] Beyond acceptable values due to large sample size.

Table 3
Correlations among latent variables.

	Immersion	Achievement	Social appearance anxiety	General self-efficacy	Academic self-efficacy
Social	403[a]	.416[a]	.068[a]	.290[a]	.271[a]
Immersion		.389[a]	.201[a]	.285[a]	.246[a]
Achievement			.062[a]	.316[a]	.266[a]
Social appearance anxiety				.019	−.007
General self-efficacy					.630[a]

[a] Correlation is significant at 0.001 or below.

other words, the relationship between self-efficacy and gaming motivations, and the relationship between social appearance anxiety and immersion were sustained.

In order to see the role of further background variables on gamer profiles, a stepwise multiple regression analysis was conducted to investigate the contribution of available predictor variables (i.e., education level, gender, job status, age) on the outcome variable (i.e., playing hours). Age, education level and job status explained 1.8% of the outcome variable. Although the result was statistically significant ($F_{(3,4793)} = 30.095$; $p < 0.05$), the relationship was regarded as practically trivial because of the low R^2 along with the probability of committing Type I error due to huge sample size (Huck, 2012). A further stepwise regression revealed that online gaming motivations, social appearance anxiety, general self-efficacy, and academic self-efficacy revealed the same pattern with regard to statistical versus practical significance while predicting playing hours ($R^2 = 1.6\%$; $F_{(4,4784)} = 20{,}933$; $p < 0.05$).

Through a one-way between-groups ANOVA, reported playing hours were compared with regard to education, which revealed a statistically significant difference with a small effect size ($F_{(7,\ 4876)} = 11.38$, $p < 0.001$; eta squared = 0.016). The same procedure was followed for a comparison of playing hours with regard to age groups, which revealed a similar pattern with regard to practical significance ($F_{(4,\ 4797)} = 17.82$; $p < 0.001$; eta-squared = 0.015). Table 5 illustrates the multiple comparisons among the groups with regard to age and education. Findings suggested that higher ages meant longer playing time whereas high school and undergraduate students were the most persistent players. However, the small effect size values require evaluating such findings with caution.

Playing time was further investigated with regard to gender and working situation. Independent-samples *t*-tests did not reveal a significant difference between males and females ($t_{(4482)} = 0.35$; $p > 0.05$). However, a significant difference was observed between workers and non-workers ($t_{(4482)} = 5.58$; $p < 0.01$; eta-squared = 0.06). That is, workers played significantly more than non-workers. Finally, a one-way within-subjects ANOVA revealed significant differences among the three gaming motivations addressed in the current study (Wilk's Lambda = 0.429; $F_{(2,5378)} = 2929.37$; $p < 0.001$; partial eta squared = 0.52). According to the multiple comparisons with the Bonferroni procedure, all motivations differed significantly from each other where achievement (Mean = 4.34; SD = 0.83) was the leading motivation among MMOFPS players followed by social (Mean = 3.63; SD = 0.93) and immersion (Mean = 3.35; SD = 0.97).

6. Discussion and conclusion

The current study focused on gaming motivations of MMOFPS players with regard to social appearance anxiety, general self-efficacy and academic self-efficacy. In addition to a structural equation model proposal, gamer profiles and predictors of playing hours were investigated. CFAs across datasets revealed that selected measures, which were frequently used in international settings, were robust and reliable in the current context. In addition, the structural equation model revealed acceptable or perfect fit values, which could be used to explain the relationships among self-efficacy, social appearance anxiety and motivations of play. However, some relationships suggested in the current model can be regarded as extraordinary considering the contemporary gaming literature.

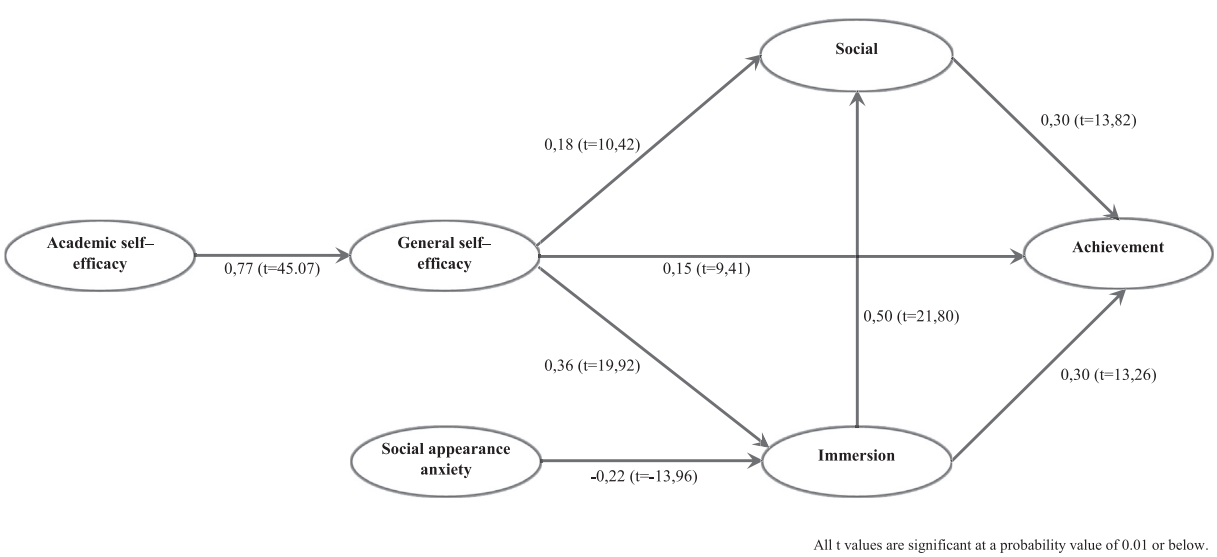

Fig. 1. The proposed structural equation model.

Table 4
Evaluation of the structural equation model across samples.

Index	Acceptable	Game 1	Game 2	Overall	Rationale
χ^2	N/A	2842.95	7917.70	9538.46	–
df	N/A	936	936	936	–
χ^2/df	$0 \leq \chi^2/df \leq 3$	3.037[a]	8.459[a]	10.191[a]	Kline (2005), Sumer (2000)
RMSEA	$0 \leq RMSEA \leq 0.08$	0.043	0.042	0.041	Hooper, Coughlan and Mullen (2008)
SRMR	$0 \leq SRMR \leq 0.10$	0.052	0.050	0.049	Kline (2005)
NFI	$0.90 \leq NFI \leq 1.00$	0.97	0.97	0.98	Thompson (2004)
NNFI	$0.90 \leq NNFI \leq 1.00$	0.98	0.98	0.98	Tabachnick and Fidell (2001)
CFI	$0.90 \leq CFI \leq 1.00$	0.98	0.98	0.98	Tabachnick and Fidell (2001)
GFI	$0.90 \leq GFI \leq 1.00$	0.90	0.92	0.93	Schumacker and Lomax (1996)

[a] Beyond acceptable values due to large sample size.

First of all, social appearance anxiety and immersion was related as expected. However, this anxiety negatively predicted the immersion motivation. That is, when social appearance anxiety increased, immersion motivation decreased. This finding suggested that MMOFPS gamers were not present in this online world to compensate their negative emotions about their physical appearance. Such a finding can be explained through the game mechanics in MMOFPSs. MMOFPSs are more achievement-oriented than other MMO genres. When users advance in the game, they gather more sophisticated weapons to impose upon their rivals in further levels. As indicated in the current structural model, the utmost aim is "to achieve". Furthermore, immersive components of the game (e.g., role-playing) are reflected at a weaker level in MMOFPSs than MMORPGs. Even though the literature suggested a relationship between physical appearance and representation of one's self in online environments (Toma & Hancock, 2010), current findings may imply that MMOFPSs fall short to provide sufficient opportunities for physically representing users' selves. Thus, it is more likely for the individuals with social appearance anxiety to participate in MMORPGs than MMOFPSs.

Such speculations based on the differences between MMORPGs and MMOFPs in terms of game mechanics can be further supported through considering the findings of Yee et al. (2012), who maintained that socialization was the prominent motivation followed by immersion and achievement. Conversely, the current study focused on MMOFPS settings and showed that achievement was the leading motivation followed by socialization and immersion. Such differences observed in different game genres could have influenced current findings. On the other hand, achievement was regarded as the leading motivation in a similar research context with MMORPG players (Dindar & Akbulut, 2014). Thus, the dominance of achievement over socialization and immersion could be a culture-specific aspect as well.

Another evidence regarding the impact of genre differences can be proposed through a discussion on gaming motivations. Dindar and Akbulut (2014) studied with MMORPG players and applied Yee's (2007) framework on motivations of play. In the study, social motivation was the predictor of immersion. The same framework was used in the current study, which revealed that immersion was the predictor of social motivation. Thus, the change can be explained through the differences in gaming features of MMOFPSs and MMORPGs. However, further studies comparing these two environments are necessary to corroborate such speculations since the culture-specific aspects might be on stage again.

The structural model further maintained that higher academic and general self-efficacy were predictors of higher gaming motivations in MMOFPSs. These findings contradicted with the arguments of Williams et al. (2008) who expected that people would play MMOGs to compensate their lack of achievement in their real lives. The current finding can be interpreted with social cognitive theory of Bandura (1997), who stated that individuals with higher self-efficacy would prefer to get involved in more challenging tasks. Thus, it can be concluded that individuals with higher self-efficacy enjoy the original challenges presented in MMOFPSs.

The demographics of MMOFPS players were explored in the current study as well. Our findings retain the conclusions of Jansz and Tanis (2007) regarding stereotypical FPS gamer profile. That is, the majority of gamers in the current study were studying males at their early or late adolescence. The mean playing time in the current sample were also similar to the findings of Jansz and Tanis (2007), and that of Dindar and Akbulut (2014) who studied in a similar research context with MMORPG players. Furthermore, the findings also revealed that mean playing time was increasing as the age increased. However, less playing at early ages can also be related to parental supervision.

Table 5
Multiple comparisons of playing hours with regard to age and education.

		Mean	SD	Significantly different from
Age				
1	0–13 (*n*: 1152)	15.43	18.81	2, 3, 4, 5
2	14–18 (*n*: 3047)	18.66	20.57	1, 3, 5
3	19–23 (*n*: 382)	22.74	24.26	1, 2
4	24–28 (*n*: 129)	24.29	24.15	1
5	>28 (*n*: 92)	28.10	26.99	1, 2
Education				
1	Primary school student (*n*: 1427)	16.18	19.52	3, 4, 5, 6
2	Primary school graduate (*n*: 587)	16.07	18.85	3, 4, 5, 6
3	High school student (*n*: 2207)	19.06	20.76	1, 2
4	High school graduate (*n*: 289)	23.51	23.24	1, 2
5	Undergraduate student (*n*: 191)	23.78	24.84	1, 2
6	Undergraduate degree (*n*: 85)	28.58	28.67	1, 2
7	Graduate student (*n*: 16)	20.06	25.80	
8	Graduate degree (*n*: 82)	22.69	26.33	

Findings regarding the predictors of playing time were also curious. Although the proposed model explained the relationships between gaming motivations and personal characteristics with ideal fit values, further regression analyses revealed that none of the variables in the model was practically important in predicting the time spent on MMOFPSs. Furthermore, none of the background variables (i.e., education level, gender, job status, age) predicted playing time at a practically significant level either. These findings suggest that further studies are necessary to explore the variables which predict the time spent on MMOFPSs with higher explained variance values.

The current study poses several limitations. For instance, findings are limited to two Turkish MMOFPSs. Although current MMOFPSs had similar features, each game environment has its unique mechanics. Therefore, further studies should be implemented in other cultures, genres and scenarios to generalize findings revealed in the current study. Particularly, investigating the relationships between social appearance anxiety and gaming motivations in MMORPGs can be quite plausible to understand whether high social appearance anxiety leads to higher levels of gaming motivations in such contexts which offer higher immersion opportunities. Moreover, no data revealing the actual physical characteristics of players were sought for. Thus, the relationships among real physical characteristics, playing time and gaming motivations could not be investigated. In brief, to retain current hypotheses and extend arguments, further large-scale implementations addressing additional variables can be quite plausible to compare gamer profiles in different genres such as MMORPGs and MMOFPSs.

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