



# Predictors of Gaming Disorder Among University Students

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## Abstract

The number of individuals playing online competitive games is increasing day by day. Although these games are sometimes played for purposes such as socializing or having fun, they can sometimes lead to negative consequences such as gaming disorder. Playing online games is common among university students. Therefore, the aim of this study is to reveal the variables that lead to gaming disorder in university students who play online games. For this purpose, data were collected from 1014 university students who actively play online games. 64.5% of the students were male, 35% were female and 0.5% did not want to specify their gender. Their average age is 22.82 (sd=4.21). Based on the results, competition, fantasy, and coping game playing motivations, age of the students and time spent playing games were found to be predictors of gaming disorder among online gamers. Socialization and enjoyment motivations were not significant predictors of gaming disorder. All variables together explained 35% of the variance in gaming disorder.

**Keywords:** gamers, gaming motivation, online video games, time spent on game

## 1. Introduction

The game is defined as “an activity which provides amusement or fun; an amusement, a diversion, a pastime” by Oxford English Dictionary (2024). Video games are entertainment software that can be played with technological devices such as computers, game consoles, handheld consoles, and mobile phones. If a video game enables people in different physical locations to play together via an Internet connection, it is called an online game. Additionally, online games are classified according to whether they are competitive or cooperative. Online

competitive games are divided into two categories, amateur and professional, like sports, and are also called e-sports (Coleman, 2019).

Particularly in recent years, massively multiplayer online games have begun to spread rapidly in the video game industry, allowing large numbers of players to simultaneously access an online gaming environment and interact with each other (Dupuis and Ramsey, 2011, Jung et al., 2014, Taylor and Taylor, 2009). In Türkiye, more than 50% of individuals who play video games are under the age of 35, with the majority in the 18-34 age range at 38% (Ministry of Youth and Sports, 2021). It can be said that the e-Sport industry generally targets groups such as children, adolescents and young adults of the country (Lu, 2016).

Online games can sometimes have a negative impact on players. One of the most prominent of these effects is gaming disorder. According to the American Psychiatric Association (2013) Internet Gaming Disorder is defined as "a pattern of excessive and prolonged Internet gaming that results in a range of cognitive and behavioral symptoms, including progressive loss of control over gaming, tolerance and withdrawal symptoms, similar to the symptoms of substance use disorders". There have been many studies on when Internet gaming ceases to be fun and becomes a disorder, and many different variables have been listed.

Among these variables, the ones that have come to the forefront recently are the motivations for playing and the amount of time spent playing. Game motivations can be defined as the internal drives that push individuals to play games and sustain their game playing behavior. There are various types of classifications in terms of gaming motivations. One of these was stated by Evren et al. (2020):

- socialization motivation, which is about playing games and making friends.
- escape and coping motivation, which is about escaping from real life problems and reducing tension and anger through play.
- competition motivation, which is about beating others.
- skill development motivation, which is about skill acquisition such as coordination and focus.
- fantasy motivation, which is about trying out new identities.
- enjoyment motivation, which is about having a good time.

Gaming motivations are the strongest predictor of gaming disorder (Kneer & Rieger, 2015; Kuss et al., 2012). Different studies have found a relationship between different gaming motivations and gaming disorder. When the studies were examined, it was found that escape motivation, coping, fantasy, and social motivations were significantly higher in individuals with gaming disorder. (Billieux et al., 2011; Cole & Griffiths, 2007; Fuster et al., 2013; Király et al., 2015; Kuss et al. 2012; Kwon, Chung, & Lee, 2011; Yee, 2006). Therefore, although it is known that there is a relationship between game playing disorder and game motivation, there is no clarity in the literature about which motivations may be more related to game playing disorder in which age groups.

Addition to game motivations, studies show that increasing amount of time spent playing increases the risk of game addiction (Akgün Kostak & Kocaaslan, 2020; Aydın & Horzum, 2015; Çavuş et al., 2016; Çevik et al., 2020; Güvendi et al., 2019; Korkmaz & Korkmaz, 2019; Oral & Arabacıoğlu, 2019; Zorbaz et al., 2015). Also gaming disorder predicts time spent on the computer during weekend mornings (Triberti et al., 2018). Moreover, those who are motivated by competence, autonomy and relatedness spent more time on the online games (Johnson et al., 2016).

Although there is a growing body of research in the literature on the relationship between motivations for play, time spent on game, and gaming disorder, it is still not clear which

motivations are more likely to lead to gaming disorder. When it is seen that there is a relationship between game motivation and time spent on the game and that these variables are also related to game playing disorder, it is important that all these variables are considered together to explain the game playing disorder of university students. Therefore, the aim of this study is to reveal the variables that lead to gaming disorder in university students who play online video games. With this aim, the question of whether individuals' age, duration of gaming, coping, fantasy, enjoyment, socialization, skill development, and level of competitiveness significantly predict gaming disorder will be addressed.

## **2. Methods**

### **2.1 Model of the Research**

This study was conducted with the relational research model, which is among the quantitative research designs. Relational studies are studies used to examine the relationship between measurements of different variables obtained from the same individuals (Mertens, 2010). For this purpose, this research, which investigates the significant predictors of individuals' gaming disorder, is a relational research type.

### **2.2 Study Group**

The study group of the research consists of university students who continue their education at universities in different provinces of Turkey. In this regard, a study group consisting of 1014 university students in total was reached. The study group consists of 654 (64.5%) male, 355 (35.5%) female and 5 (0.5%) participants who did not specify their gender. The average age of the participants is 22.8 (sd=4.2). The individuals participating in the study consisted of at most 219 (21.6%) university sophomores and at least 10 (1%) sixth graders and above. Of the individuals participating in the study, 114 (11.2%) were lower level, 455 (44.9%) were middle level, 339 (33.4%) were lower middle, 102 (10.1%) were upper middle and 4 (0.4%) were upper level. He stated that he belonged to the socio-economic class.

### **2.3 Data Collection Tool**

The data collection tools of the research are the Motivation Scale for Online Game Playing (MOGQ), Internet Gaming Disorder Scale (IGDS) and a personal information form. MOGQ was developed by Evren, Evren, Dalbudak, Topçu, and Kutlu (2020) with data collected from 752 online video gamers aged between 11 and 60, with an average age of 23. As a result of the explanatory factor analysis conducted within the scope of the validity study, it was seen that the scale consisted of six factors and 27 items. This six-factor structure was tested with confirmatory factor analysis, and it was seen that the scale had good fit indices ( $\chi^2 / df = 710.5/251 = 2.83$ ; GFI = 0.929, CFI = 0.971, TLI = 0.962, and RMSEA = 0.049). At the same time, for the convergent validity and criterion-related validity of the scale, the correlations between MOGQ and game playing time and the IGDS9-SF and EGMQ scales were examined, and it was found that the dimensions of MOGQ showed significant correlations with the variables in question. Within the scope of the reliability studies of the scale, the Cronbach Alpha internal consistency coefficient was calculated, and it was observed that the coefficients of the dimensions of the scale varied between 0.92 and 0.87. IGDS aims to measure the degree of gaming disorder by examining individuals' online and offline gaming activities in the last 12 months. This scale, developed by Pontes and Griffiths (2015), was used by Evren et al. It was adapted into Turkish by (2018). As a result of the explanatory factor analysis conducted within the scope of the adaptation studies of the scale, it was seen that the scale consists of nine items. It was revealed that the fit indices obtained as a result of confirmatory factor analysis

( $\chi^2 / df = 99.5/23 = 4.32$ ; GFI = 0.982, CFI = 0.985, TLI = 0.976 and RMSEA = 0.052) showed good fit. Within the scope of the reliability studies of the scale, the Cronbach Alpha internal consistency coefficient was calculated as 0.89.

## **2.4 Data Analysis**

Data analysis was done with the help of SPSS 26 computer program. To prepare the data set for analysis, missing and extreme values were removed and data that violated normality were also removed from the data set. In line with the purpose of the research, the data were analyzed with multiple regression analysis.

While the degree of relationship between two variables is determined by correlation, the process of predicting the other variable with the help of at least one variable is called regression (Tabachnick and Fidel, 2020). Regression analysis is the explanation of two or more variables that are related to each other with a mathematical model, where one is the dependent variable, and the others are independent variables (Büyüköztürk, 2018). In many applications related to regression analysis, there are situations where more than one independent variable is involved. A regression model that includes more than one independent variable is called a multiple regression model (Kunter et al., 2005; Montgomery & Runger, 2005).

Regression analysis has some assumptions that must be met. These assumptions: dependent and independent variables must be at least on an equal interval scale, they must be continuous variables and show normal distribution, variances must be homogeneous among independent variables, and there must be no relationship above .80 between two or more independent variables (Deniz, 2020).

Gaming disorder, which is the dependent variable in this study; The variables that are investigated whether they predict the dependent variable are the independent variables of age, playing time, coping, fantasy, entertainment, socialization, skill development and competition.

## **3. Findings**

### **3.1 Findings of the Validity and Reliability of the Data Collection Tools**

Confirmatory factor analysis was conducted for the construct validity of the scale with the data collected in this study, and the fit values were examined as a result of the analysis. When the item factor loadings of the items of the MOGQ were examined, it was seen that the item factor loading of item 18 was below 0.30 and the error variance was high. In addition, when the factor analysis results in the development phase of the scale were examined, it was seen that item 18 loaded on two separate dimensions and the factor loadings were close to each other. For this reason, item 18 was removed from the scale and CFA analysis was performed. The fit index values are at an acceptable level ( $\chi^2/df=5.40$ , CFI=0.900, TLI=0.890, RMSEA=0.073, 95%CI [0.070-0.077], SRMR=.076). RMSEA values less than 0.07 indicate good fit (Tabachnick and Fidel, 2020; Sümer, 2000), and CFI and TLI values close to 1 indicate good fit (Bentler and Bonett, 1980). In this study, the internal consistency reliability coefficient of the scale was found to be 0.905 for the first dimension, 0.867 for the second dimension, 0.854 for the third dimension, 0.858 for the fourth dimension, 0.833 for the fifth dimension and 0.860 for the sixth dimension.

Confirmatory factor analysis was conducted for the construct validity of the IGDS and the fit values were examined as a result of the analysis. The fit index values are at an acceptable level ( $\chi^2/df=5.84$ , CFI=0.932, TLI=0.910, RMSEA=0.078, 95%CI [0.066-0.090],

SRMR=.040). In this study, the internal consistency reliability coefficient of the scale was found to be 0.832.

### 3.2 Findings of the Test of Assumptions

Skewness and kurtosis values were examined for normality of the data. As a result of the normality analysis performed for the variables, the skewness and kurtosis values for each variable are between -1 and +1. In this case, the data shows a distribution close to normal distribution. Pairwise correlations of the variables were examined for multicollinearity of the data. The existence of a relationship of .80 or above between variables causes multicollinearity problems (Field, 2009). According to the results of the analysis, a relationship below .80 was found between the variables. In addition, variance increase factor (VIF), margin of error (Tolerance) and condition index (CI) values were also examined to determine multicollinearity between the variables. According to Gaur & Gaur (2009), a VIF value greater than 5, a CI value greater than 30, and a tolerance value less than 0.02 indicate multicollinearity. As a result of the analysis, VIF values for the variables were found to be less than 5, Tolerance values were greater than 0.02, and CI values were less than 30. The outputs of these findings are shown in Table 1 below.

Table 1: Multiple Linearity Analysis Results of Variables

Variables	VIF	Tolerance	CI
Coping/Escapism	1.716	0.583	6.132
Fun	1.640	0.610	7.517
Fantasy	1.572	0.636	8.392
Skill Development	1.682	0.594	10.008
Social	1.509	0.663	11.796
Competition	1.429	0.700	13.576
Time Spent	1.139	0.878	27.553
Age	1.019	0.981	18.970

According to these results, there is no multicollinearity/collinearity problem in the data. In this research, all assumptions were examined, and it was found that the assumptions were met.

### 3.3 Findings Related to the Research Question

Research Question: Do individuals' age, playing time, coping, fantasy, entertainment, socialization, skill development and competition levels significantly predict gaming disorder? Before testing the research question, Pearson correlation coefficients were calculated to reveal the relationships between variables and are given in Table 2.

Table 2: Relationships Between Variables

Pearson Correlation	Gaming Disorder	Coping/ Escapism	Fun	Fantasy	Social	Competition	Age	Time Spent	Skill Development
Gaming Disorder	1	0,512	0,289	0,416	0,237	0,339	0,04	0,325	0,212
Coping/ Escapism	0,512	1	0,502	0,551	0,332	0,331	-0,016	0,267	0,373
Fun	0,289	0,502	1	0,396	0,398	0,44	-0,045	0,241	0,457
Fantasy	0,416	0,551	0,396	1	0,377	0,336	-0,031	0,182	0,353
Social	0,237	0,332	0,398	0,377	1	0,321	-0,052	0,244	0,518
Competition	0,339	0,331	0,44	0,336	0,321	1	-0,065	0,231	0,458
Age	0,04	-0,016	-0,045	-0,031	-0,052	-0,065	1	-0,095	0,016
Time Spent	0,325	0,267	0,241	0,182	0,244	0,231	-0,095	1	0,232
Skill Development	0,212	0,373	0,457	0,353	0,518	0,458	0,016	0,232	1

When the table is examined, the dependent variable of gaming disorder shows a positive relationship with the variables of age, coping, entertainment, fantasy, socialization, competition, skill development and playing time. The age variable shows a low negative relationship with all variables except the skill development variable.

Table 3: Regression Analysis Results for Predicting Gaming Disorder

Model	B	Std.Error	$\beta$	T	p	Zero order	partial r
Constant	4,506	1,462		3,083	0,002		
Coping/ Escapism	0,371	0,034	0,362	10,888	0,000	0,512	0,325
Fun	-0,108	0,082	-0,043	-1,329	0,184	0,289	-0,042
Fantasy	0,268	0,051	0,168	5,282	0,000	0,416	0,164
Social	0,40	0,054	0,023	0,741	0,459	0,237	0,023
Competition	0,298	0,050	0,182	6,012	0,000	0,339	0,186
Age	0,142	0,045	0,082	3,194	0,001	0,040	0,100
Time Spent	0,895	0,126	0,192	7,090	0,000	0,325	0,218
Skill Development	-0,172	0,055	-0,104	-3,159	0,002	0,212	-0,099

$R = 0.595, R^2 = 0.353$

$F(8,1004) = 68.621 p < .05$

When Table 3 is examined, it is seen that age, playing time, competition, skill development, socialization, fantasy, entertainment, and coping variables together significantly predict gaming disorder ( $R^2 = 0.353, p < .05$ ). These variables together explain 35% of the total variance of gaming disorder. While age, playing time, competition, skill development, fantasy and coping variables were significant predictors of gaming disorder ( $p < .05$ ), it was observed that entertainment and socializing were not significant predictors ( $p > .05$ ). While the coping/escape variable is the most important predictor in the model ( $\beta = 0.362, p < .05$ ), this variable is followed by playing time ( $\beta = 0.192, p < .05$ ) and competition ( $\beta = 0.182, p < .05$ ) variables.

#### 4. Discussion

Based on the present study; competition, skill development, fantasy and coping/escape motivations are related to gaming disorders but not entertainment and socialization. When the literature was examined it was seen that there was no clarity between the studies which explained the relationship between gaming disorder and game motivations. For example, Laconi, Pirès, and Chabrol (2017) found that individuals who play games with socialization, escape, coping, and fantasy motivations are more likely to develop gaming disorder. Kuss, Louws, and Wiers (2012) suggest that there is a relationship between escape motivation and mechanistic motivation, which refers to motivation for structural characteristics such as game design, and excessive game playing. In another study it has been found that coping, fantasy, and social motivations are significantly higher among people with gaming disorder (Cole & Griffiths, 2007). In a meta-analysis study, it was found that motivations related to emotional escape were robustly associated with gaming disorder symptoms (Bäcklund et al., 2022). In another study, the strongest such association was found to be with escapism motivation, but this connection is much stronger in individualistic regions (Wang & Cheng, 2022). Cross-cultural comparisons might help to enlighten the relations between gaming disorder and gaming motivation.

Although meta-analysis studies show that escape motivation is the variable most associated with gaming disorder, cross-sectional studies may yield different results. Therefore, the effect of gaming motivations on gaming disorder was well proofed but the type of the gaming motivation might differ based on the sample characteristics. However, the finding that escape was the most important predictor in this study is consistent with meta-analysis studies. Students

who want to escape from problems or people in their lives and use play as a coping/escape method are likely to feel more positive emotions, such as relaxation, during play. This can lead them to spend more time at the game with the desire to maintain this emotional state and lead to gaming disorder. Moreover, competitive motivation predicts gaming disorder in the third order. It can be argued that players who are in competition with others may be more likely to engage in games in order to be more successful in the game, which may lead to gaming disorder.

In the present study time spent on the game was a significant predictor of gaming disorder. In the study conducted by Çavuş et al., (2016) with university students, it was found that the risk of game addiction increased as the playing time increased. Studies conducted with primary and secondary school students and teachers have also found that increasing the playing time increases the risk of game addiction (Aydın & Horzum, 2015; Çevik et al., 2020; Güvendi et al., 2019; Oral & Arabacıoğlu, 2019; Korkmaz & Korkmaz, 2019). It has also been proven in the present study that time spent in front of the computer is directly related to gaming disorder. The fact that online games are played simultaneously may cause students to spend more time in front of the game and may cause them to show various withdrawal symptoms when they are not online. Online games are especially risky in terms of increasing the time spent in the game as they require continuous connection to the game due to their structure. In this study, the finding that the time spent playing games as a predictor of gaming disorder confirms this.

It is a surprising result that gaming disorder increases with increasing age. Although it has been observed in the literature that gaming disorder is higher in the young adults group, including university students, than in older groups (Kim et al., 2022) previous studies have shown that gaming disorder decreases with decreasing age (Wartberg et al., 2017). When the findings of the study are evaluated together, it is seen that with increasing age, the class level increases and the responsibilities of the students increase. Moreover, they have different problem areas to deal with and they may turn to play more to avoid this. Therefore, in this study, it may have been observed that as the age increases, play disorder increases.

## **5. Conclusion**

In conclusion, among gaming motivations competition, skill development, fantasy and coping/escape motivations, age and time spent on the game predict gaming disorder among university students. However, motivations for entertainment and socialization are not significant predictors of gaming disorders. Therefore, it can be said that the relationship between game motivation and game playing disorder depends on the type of motivation. Considering these variables in interventions for gaming disorder may increase the effectiveness of interventions. In other words, in mental health services to be provided to students with or at risk of gaming disorder, the motivations of students to play games can first be revealed. With the intervention studies to be carried out towards these motivations, it may also be possible to intervene in gaming disorder.

This study also has some limitations. First of all, the study was conducted with university students in Turkey and the findings can be generalized to groups with similar characteristics. In the study, game playing disorder was measured based on self-assessments and no clinician observation was used. Therefore, it should be kept in mind that the findings reflect the self-perceptions of the students. Finally, the motivations for playing games addressed in this study are limited to those measured by the scale and other motivations for playing games were not included in the study. In addition to these limitations, this study contributes to the literature in terms of working with a large sample and addressing the motivations for playing games separately.

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