

## ORIGINAL RESEARCH

# Psychometric Validation of the Turkish Motives for Online Gaming Questionnaire (MOGQ) Across University Students and Video Game Players

Cüneyt Evren<sup>1</sup> , Bilge Evren<sup>2</sup> , Ercan Dalbudak<sup>3</sup> , Merve Topçu<sup>4</sup> , Nilay Kutlu<sup>2</sup> 

<sup>1</sup>Treatment and Training Center for Alcohol and Substance Dependence (AMATEM) Bakırköy Training and Research Hospital for Psychiatry, Neurology and Neurosurgery, İstanbul, Turkey

<sup>2</sup>Department of Psychiatry, Baltalimani Bone Diseases Training and Research Hospital, İstanbul, Turkey

<sup>3</sup>Department of Psychiatry, Yüksek İhtisas University School of Medicine, Ankara, Turkey

<sup>4</sup>Department of Psychology, Çankaya University School of Arts and Sciences, Ankara, Turkey

**ORCID iDs of the authors:** C.E. 0000-0002-4431-3514; B.E. 0000-0003-4934-662X; E.D. 0000-0001-8563-5440; M.T. 0000-0003-3181-2864; N.K. 0000-0003-3506-7275.

## Main Points

- When investigating the effects of video game play on behaviors, it is paramount to examine the underlying psychological motives leading individuals to engage with the activity.
- The most currently used motivational typology for gaming behaviors has been developed by Demetrovics et al. (2011); the 27-Item Motives for Online Gaming Questionnaire (MOGQ).
- Turkish version MOGQ has six motivational factors with high internal consistency; social ( $\alpha=0.87$ ), coping/escape ( $\alpha=0.91$ ), competition ( $\alpha=0.89$ ), skill development ( $\alpha=0.91$ ), fantasy ( $\alpha=0.88$ ), and recreation ( $\alpha=0.92$ ).
- Turkish version MOGQ showed adequate convergent and criterion-related validity.
- The Turkish version of the MOGQ is a valid and reliable tool for determining the motives for online gaming among young adults.

## Abstract

The main aim of the current study was to test the factor structure, reliability, and validity of the 27-Item Motives for Online Gaming Questionnaire (MOGQ), a standardized measure to assess seven types of motivation for online gaming. In the present study, participants were assessed with the MOGQ, the nine-item Internet Gaming Disorder Scale-Short Form (IGDS9-SF), and the Electronic Gaming Motives Questionnaire (EGMQ). The mean age and age at first gaming were lower and the socio-demographic factors such as male gender, living alone, having a game console, gaming more than usual in weekends, time spent on the gaming, having problems related with gaming, severity of IGD symptoms, and severity of online gaming motives were higher among the group of gamers than those in the group of students. Confirmatory factor analyses demonstrated that the six-factor structure (i.e., the dimensional structure) of the MOGQ was satisfactory for the Turkish version. The scale was also reliable (i.e., internally consistent with a Cronbach's alpha of 0.91 for coping/escape, 0.92 for recreation, 0.88 for fantasy, 0.91 for skill development, 0.87 for social, and 0.89 for competition) and showed adequate convergent and criterion-related validity, as indicated by statistically significant positive correlations with average time daily spent playing games during last year, IGDS9-SF, and EGMQ scores. These findings support the Turkish version of the MOGQ as a valid and reliable tool for determining the motives for online gaming among young adults.

**Keywords:** E-sports, internet gaming disorder, MOGQ, scale, university students, young adults

## Corresponding author:

Cüneyt Evren

E-mail:

cuneytevren@yahoo.com

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## Introduction

Internet gaming is a common legitimate leisure internet activity, but it can turn pathological for some

players when the activity becomes dysfunctional and cannot be controlled despite associated problems, harming an individual's social, occupational, family, school, and psychological functioning (Gen-

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tile et al., 2011; Griffiths, 2005; Lemmens, Valkenburg, & Peter, 2009). Furthermore, the current state of research regarding the clinical relevance of gaming, its health burden, and the neurobiological similarities to other addictive disorders (Saunders et al., 2017) had led to internet gaming disorder (IGD) to be included both in the Diagnostic and Statistical Manual of Mental Disorders 5<sup>th</sup> Edition (DSM-5) as “a condition that requires further research before being fully recognized and accepted as an independent disorder in subsequent publications of the DSM” (American Psychiatric Association, 2013; Petry & O’Brien 2013) and in the International Classification of Diseases 11<sup>th</sup> Revision (ICD-11) as “a mental disorder” (World Health Organization, 2019). Nevertheless, while most studies focus on the hazards and disadvantages of online gaming, it has been suggested that online games also constitute fresh methods to meet important human requirements under the circumstances of modern culture (Demetrovics et al., 2011). The severity of IGD symptoms was found to be related with basic psychological needs (Bekir & Celik, 2019) and psychiatric disorders, such as attention deficit hyperactivity disorder (Evren, Evren, Dalbudak, Topcu, & Kutlu, 2019). Additionally, the severity of IGD symptoms is related with personality dimensions such as sensation seeking (Bekir & Celik, 2019), neuroticism, and introversion (Evren et al., 2019). Indeed, the popularity of the games suggests that they satisfy people’s basic needs; therefore, they cannot simply be marked as good or bad (Demetrovics et al., 2011). Instead, from a motivational view, their features may be examined by exploring the reasons and motives behind playing them without considering their useful or hazardous nature. Motives are sets of information that represent emotional preferences expressed in our thoughts and ideas, referring to particular desirable or unwanted goals and categories of goals (McClelland, 1985). These motives can be considered as our behavior’s energizing and determining factors (Demetrovics et al., 2011).

Different approaches have been used to categorize these motives. For example, Bartle (1996) recognized four kinds of multiplayer computer gamers (i.e., killers, achievers, socializers, and explorers) based on motives. Upon further testing of Bartle’s model, a five-factor model (i.e. relationship, manipulation, immersion, escapism, and achievement) (Yee, 2006a) and a ten-factor model (with three higher-level factors: achievement [advancement, mechanics, competition], immersion [discovery, role-playing, customization, escapism], and social [socialization, relationship, teamwork]) (Yee, 2006b) were recognized among massively multiplayer online (MMO) role-playing game (RPG) players. The findings also indicated that distinct categories were not exclusive because the players can be characterized at the same time by more than one category (Demetrovics et al., 2011).

Some authors conducted studies with the purpose of developing and validating measures of gaming motivation. For example, in line with the self-determination theory, Lafrenière, Verner-Filion, and Vallerand (2012) designed the Gaming Motivation Scale (GAMS) to assess intrinsic motivation, integrated, identified, introjected, and external regulation, as well as amotivation. Adapting from the four-dimensional Gambling Motives Questionnaire-Revised (GMQ-R), Myrseth, Notelaers, Strand, Borud, and Olsen (2017) validated the Electronic Gaming Motives Questionnaire (EGMQ), which measures four motives for gaming, including enhancement, coping, social, and self-gratification.

Demetrovics et al. (2011) created the Motives for Online Gaming Questionnaire (MOGQ) based on literature review and survey information, measuring seven dimensions of gaming motives: Social motive is about the need to play and make friends with others. Escape refers to gaming to avoid problems and difficulties in actual life. Competition is about defeating others, while skill development is about enhancing coordination, concentration, and other abilities of the player. Coping means reducing stress, tension, or aggression through gaming and getting into a better mood. Fantasy relates to testing out new identities and/or events that are not feasible in the everyday life of the gamers. Finally, recreation is about gaming for fun (Demetrovics et al., 2011; Király et al., 2015; Wu, Lai, Yu, Lau, & Lei, 2017). MOGQ is the first tool to assess motives of internet gamers from a wider age spectrum. It includes the main motives of gaming recognized in earlier studies and demonstrates high internal consistency (Wu et al., 2017). Furthermore, in contrast with former studies (Bartle, 2003; Frostling-Henningsson, 2009; Yee, 2006b), MOGQ is the first inventory to assess seven distinct internet gaming motives and can be used for all type of online games (Demetrovics et al., 2011; Wu et al., 2017).

The MOGQ was previously adapted to Turkish by Kircaburun, Jonason, and Griffiths (2018) and because the translated scale indicated mostly inadequate fit to the data, they conducted exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) using two items of each dimension that had the highest item-total correlations. Thus, they have used the seven dimension 14-item MOGQ in their study, which indicated a good fit to the data ( $\chi^2/df=1.94$ , RMSEA= .05 [CI 90% (0.03, 0.06)], CFI.98, GFI=0.97), and the seven dimensions had good internal consistencies (Cronbach’s  $\alpha=0.74$  to 0.88).

At present, the Turkish measurement tool lacks online gaming motivations. The objective of this research is therefore to assess psychometric characteristics (i.e. internal consistency, dimensionality, and construct, convergent and criteria-related validity) of the Turkish MOGQ between distinct gamers (e.g., professional and non-professional). The findings reported here may help clinicians in need of an extended information concerning the efficiency of the assessment tool for online gaming motives, which is applicable to all types of online games.

## Methods

### Participants and Procedure

To test the psychometric characteristics of the Turkish MOGQ, an online survey was performed using a cross-sectional design. Initially data were collected from people who were in the e-mail database of a company located in Istanbul that organizes e-sports tournaments (ESL Turkey Amateur e-sport players), who were in the e-mail database of a game development company located in Ankara (Taleworlds Entertainment) and Turkish-speaking gamers from gaming forums. Additional data were collected from Turkish university students in Ankara. People who reported that they did not play any games were excluded from the study.

The research protocol was approved by the Çankaya University (Turkey) Ethical Committee, and the study was confidential and anonymous. All participants gave informed consent after reading the Plain Language Information Statement. The online sur-

vey was created using Qualtrics. Participants sampled from the Çankaya University who agreed to engage in the research gained bonus credit, which added to their overall grade for the particular courses they were assigned.

A total of 980 potential participants initiated the online survey. In the initial phase of the data collection stage, which spanned from March 4 to April 12 2019, 370 amateur or professional gamers initiated the online survey, among whom 323 were included in the study because data from the rest of the participants were systematically missing. Although these respondents gave informed consent, they were excluded from the research because they did not finish the survey. None of the individuals from this group marked the option of "I never play video games". In the second phase of the data collection stage, which spanned from April 16 to May 29 2019, 610 University students initiated the online survey, among whom 429 were included in the study because among the rest, 35 did not complete the survey and 146 marked the option of "I never play video games". Thus, a total of 752 participants were included in the study.

The mean age of the sample population was 23.09 years (SD = 5.10; min = 11, max = 60). Among these, 519 were male (69.0%) and 233 were female (31.0%). Among the participants 13 (1.7%) reported themselves as "professional e-sport gamers" (receiving a regular monthly salary), whereas 43 (5.7%) reported themselves as "amateur e-sport gamers" (had a team and participated in tournaments and made money in the tournament), 211 (28.1%) as "plays games for own pleasure and/or follow e-sports," and 485 (64.5%) as "university students who frequently play games on the internet". The first three groups were considered as "gamers" (n=267, 35.5%), whereas the fourth group was considered as "students" (n=485, 64.5%).

### Measures

**Gaming Time:** Categories for weekly gaming time were the following: (1) less than seven hours weekly (less than one hour a day), (2) 7-14 hours weekly (1-2 hours per day), (3) 15-28 hours weekly (2-4 hours per day), (4) 29-42 hours weekly (4-6 hours per day), and (5) more than 42 hours weekly (more than 6 hours per day).

**Motives for Online Gaming Questionnaire (MOGQ):** Online gaming motives were evaluated by the MOGQ, which is a 27-item self-report that measures seven motives (social, escape, competition, skill development, coping, fantasy, and recreation) for online gaming (Demetrovics et al., 2011). The MOGQ uses a 5-point Likert scale from "never" to "almost always/always" with higher scores indicating higher frequency of the respective motivational dimension. Internal consistencies ranged from 0.79 to 0.90 for all seven dimensions, (Demetrovics et al., 2011).

In this study, two Turkish psychiatrists fluent in English translated the MOGQ from English to Turkish. The translated version was agreed upon by these specialists. In order to establish their comparability, the Turkish version of the MOGQ was then translated from Turkish to English by a separate translator. The final translation was presented to 30 students (15 males and 15 females) from the Çankaya University to determine whether the language was clear and to ensure the scale's face validity.

**Internet Gaming Disorder Scale-Short-Form (IGDS9-SF):** The IGDS9-SF evaluates the symptoms and severity of IGD and its detrimental impacts by examining online and/or offline gaming actions that occur over a period of 12 months (Pontes et al., 2015). The scale includes nine items that correspond to the DSM-5's nine main criteria. They are answered on a five-point Likert scale ranging from (1) never to (5) very often, and high scores on the scale translate to higher level of gaming disorder. Turkish version of the IGDS9-SF has been used in this study (Evren et al., 2018) and Cronbach's  $\alpha$  was 0.89

**Electronic Gaming Motives Questionnaire (EGMQ):** The EGMQ was adapted from the four-dimensional Gambling Motives Questionnaire-Revised (GMQ-R) to measure the motivation for engaging in electronic gaming (Myrseth et al., 2017). The confirmatory factor analyses showed that the suggested EGMQ (measuring enhancement, coping, social, and self-gratification motives) showed adequate fit and internal consistency. The four-dimensional EGMQ is a valid instrument for measuring motives for gaming. The four dimension 14-item EGMQ indicated a good fit to the data ( $\chi^2/df=2.82$ , RMSEA=0.049 [CI 90% (0.039, 0.060)], CFI=0.987, GFI=0.977) and the four dimensions had good internal consistencies (0.80 for social, 0.81 for self-gratification, 0.84 for coping and 0.85 for enhancement).

### Data Analysis

IBM SPSS Statistical Analysis for Social Sciences, Version 20 (IBM Corp.; Armonk, NY, USA) was used for statistical analyses, other than CFA, for which IBM SPSS Amos was used. Before the analyses, data cleaning was performed by inspecting cases with serious missing values across the primary tools of interest. Categorical variables were compared by means of the chi-squared statistics. Odds ratios and 95% confidence intervals were calculated. Using a combination of visual inspection, assessment using skewness and kurtosis (West, Finch, & Curran, 1995), and formal normality tests, we concluded that the assumption of normality is not acceptable. Thus, we used nonparametric method *U* test to compare the groups on continuous variables.

The following methods were used to explore the psychometric characteristics of the Turkish MOGQ: (a) its factorial structure was first examined using EFA and then CFA; (b) convergent and criterion-related validity were determined by estimating Pearson product moment correlation coefficients between the total scores of the IGDS9-SF, MOGQ, and the self-reported average daily time spent playing games during last year; (c) internal consistency was assessed using Cronbach's  $\alpha$ .

## Results

### Sociodemographic and Clinical Variables According to Gender

The mean age and age at first gaming were lower and the socio-demographic factors of male gender, living alone, having a game console, gaming more than usual in weekends, time spent on gaming, and having problems related with gaming were higher among the group of gamers than those in the group of students. The severity of IGD symptoms and online gaming motives were higher in this group as well (Table 1).

### Factor Structure

To investigate the MOGQ's factor structure and dimensionality, the data collected were used to conduct an initial EFA followed by CFA.

Table 1.  
Comparing Sociodemographic and Clinical Variables to the Groups

	Group				$\chi^2$	p
	Gamer		Student			
	n=267	35.5%	n=485	64.5%		
	n	%	n	%		
Age (M±SD)	22.55	4.06	23.38	5.57	-1.475	0.140
Gender					69.882	<0.001
Male	235	88.0	284	58.6		
Female	32	12.0	201	41.4		
Romantic relationship (n, %)	122	45.7	207	42.7	0.635	0.426
Marital status					7.131	0.068
Married	8	3.0	31	6.4		
Divorced	5	1.9	3	0.6		
Single	242	90.6	423	87.2		
Other	12	4.5	28	5.8		
Living with...					16.094	0.003
Living alone	40	15.0	34	7.0		
.. partner	17	6.4	22	4.5		
.. roommate	25	9.4	59	12.2		
.. family	172	64.4	332	68.5		
.. in dorm	13	4.9	38	7.8		
Employment					5.950	0.203
Working	33	12.4	60	12.4		
Part-time worker	13	4.9	12	2.5		
Unemployed	16	6.0	20	4.1		
Student	200	74.9	376	77.5		
Other	5	1.9	17	3.5		
Do you have a game console where you live?*	120	44.9	141	29.1	19.142	<0.001
Time spend on the gaming <sup>a</sup> , hours (n, %)					125.224	<0.001
Less than 7 h/pw (less than 1 h/pd)	23	8.6	184	37.9		
More than 7 hours, less than 14 h/pw (more than 1 hour, less than 2 h/pd)	43	16.1	135	27.8		
More than 15 hours, less than 28 h/pw (more than 2 hours, less than 4 h/pd)	90	33.7	86	17.7		
More than 29 hours, less than 42 h/pw (more than 4 hours, less than 6 h/pd)	67	25.1	48	9.9		
More than 42 h/pw (more than 6 h/pd)	44	16.5	32	6.6		
Gaming more than usual in weekends**	163	61.0	205	42.3	24.306	<0.001
Age (years) at first gaming					12.663	0.013
Before 6	93	34.8	112	23.1		
Between 7-12	142	53.2	293	60.4		
Between 13-17	24	9.0	60	12.4		
Between 18-25	4	1.5	9	1.9		
After 25	4	1.5	11	2.3		
Having problems related with gaming***	95	35.6	127	24.7	9.908	0.002
IGDS9-SF (M±SD)	20.36	8.08	15.29	6.33	-8.926	<0.001
MOGQ (M±SD)						
Coping/Escape	19.66	7.63	15.14	7.01	-7.952	<0.001
Recreation	12.03	3.20	9.70	3.90	-8.088	<0.001
Fantasy	8.77	4.76	6.61	3.80	-6.598	<0.001

Table 1.  
Comparing Sociodemographic and Clinical Variables to the Groups (continued)

	Group				z	p
	Gamer		Student			
	n=267	35.5%	n=485	64.5%		
	M	SD	M	SD		
Skill Development	12.13	5.04	7.74	4.09	-11.416	<0.001
Social	8.76	4.03	6.21	3.18	-9.653	<0.001
Competition	12.96	4.71	8.71	4.32	-11.426	<0.001

Odds Ratio (95% C.I.)= \* 1.992 (1.460-2.717), \*\* 2.141 (1.578-2.904), \*\*\* 1.680 (1.214-2.324), z: Mann-Whitney U test, h/pw: hour per week, h/pd: hour per day, \*During last year, IGDS9-SF: Internet Gaming Disorder Scale- Short Form; MOGQ: Motives for Online Gaming Questionnaire; SD: standard deviation; M: mean

The Bartlett's Sphericity Test and the Keiser-Meyer-Olkin (KMO) measurement of sampling adequacy were used to verify the adequacy of the sample size before any further evaluation. The Bartlett's Sphericity Test was significant for the MOGQ ( $\chi^2 = 16180.446$ ,  $df = 351$ ,  $p < 0.001$ ), and the sampling adequacy measure of KMO was acceptable at 0.947.

Principal axis factoring extraction method with Promax (oblique) rotation on the 27 items of the MOGQ was performed to preliminary examine its factorial structure and construct validity. The number of components to be extracted was determined through examination of scree pilot (Byrne, 2010) in combination with the conventional Kaiser criterion guideline (all factors with eigenvalues greater than one) (Hair, Anderson, Tatham, & Black, 2010). Furthermore, the acceptable threshold of items with factor loadings above 0.50 and/or parallel loadings below 0.20 were used to retain items (Cattell, 1966). Item 18 (because it helps me channel my aggression) showed a negative loading with a standardized coefficient of  $-0.38$  for recreation factor, whereas it showed a positive loading with a standardized coefficient of  $0.35$  for coping/escape factor. Thus, this item was deleted. Based on these procedures, the EFA resulted in a six-factor solution for the 26 items of the MOGQ by reaching the criterion of an eigenvalue greater than 1 (12.720 for coping – escape, 2.438 for recreation, 1.676 for fantasy, 1.435 for skill development, 1.099 for social and 1.039 for competition). Overall, the total variance accounted for by this component was 75.58% (47.11% for coping – escape, 9.03% for recreation, 6.21% for fantasy, 5.32% for skill development, 4.07% for social and 3.85% for competition) (Table 2).

The six dimensions of the Turkish MOGQ were then subsequently assessed via CFA with maximum likelihood. In order to evaluate the quality of the model estimated in the CFA, several fit indices were used and the following thresholds adopted:  $\chi^2/df \leq 5$ , Goodness of Fit Index (GFI), Tucker-Lewis Fit Index (TLI) and Comparative Fit Index (CFI)  $> 0.90$ , and Root Mean Square Error of Approximation (RMSEA)  $< 0.05$  (Ferguson & Cox 1993; Kaiser 1960; Lin et al., 2013; Wu, Chang, Chen, Wang, & Lin 2015). The estimation of a six-dimension model produced a good fit ( $\chi^2/df = 710.5/251 = 2.83$ ; GFI=0.929, CFI=0.971, TLI=0.962, and RMSEA=0.049). As seen in tables 2 and 3, all item-component loadings were statistically significant and within the conventional acceptable threshold of  $> 0.50$ . Thus, the results from the EFA and the CFA suggest that the MOGQ assesses a six-dimension construct.

MOGQ dimensions correlated with each other, ranging between mild to moderate. Correlation coefficients ranged between 0.35

(between social and recreation dimensions) to 0.67 (between competition and skill development dimensions) (Table 3).

### Convergent and Criterion-Related Validity

The criterion of Fornell and Larcker (1981) has been commonly used to assess the degree of shared variance between the latent variables of the model. According to this criterion, the convergent validity of the measurement model can be assessed by the average variance extracted (AVE) and composite reliability (CR). AVE measures the level of variance captured by a construct versus the level due to measurement error, values above 0.7 are considered very good, whereas the level of 0.5 is acceptable. In the present study, AVE values for recreation and skill development were above 0.7 and were considered as very good, whereas values for the rest of factors was above 0.5, thus acceptable. CR is a less biased estimate of reliability than Cronbach's  $\alpha$ , the acceptable value of CR is 0.7 and above. In the present study, the CR values for all the six factors were above 0.7, thus acceptable.

Convergent validity was assessed by correlating the MOGQ scores with the scores of two related scales (i.e., the IGDS9-SF and EGMQ), and criterion-related validity was evaluated through examination of the correlation between the MOGQ scores and self-reported average daily time spent gaming during the last year. The correlation between the MOGQ dimensions and the IGDS9-SF (coping/escape:  $r = 0.64$ ,  $p < 0.001$ ; recreation:  $r = 0.36$ ,  $p < 0.001$ ; fantasy:  $r = 0.57$ ,  $p < 0.001$ ; skill development:  $r = 0.49$ ,  $p < 0.001$ ; social:  $r = 0.58$ ,  $p < 0.001$ ; competition:  $r = 0.53$ ,  $p < 0.001$ ) were mild to moderate and statistically significant (Table 3). MOGQ dimensions correlated mildly to moderately with EGMQ dimensions (Table 3). Correlation coefficients ranged between 0.35 (between social of EGMQ and recreation of MOGQ dimensions) to 0.70 (between social of EGMQ and social of MOGQ dimensions) (Table 3). Moreover, this result was also consistent with the association between the MOGQ dimension scores and self-reported average daily time spent on gaming during the last year (coping/escape:  $r = 0.42$ ,  $p < 0.001$ ; recreation:  $r = 0.47$ ,  $p < 0.001$ ; fantasy:  $r = 0.32$ ,  $p < 0.001$ ; skill development:  $r = 0.42$ ,  $p < 0.001$ ; social:  $r = 0.38$ ,  $p < 0.001$ ; competition:  $r = 0.43$ ,  $p < 0.001$ ), which were mildly correlated (Table 3). Overall, these findings show positive correlations between variables of interest in the assumed direction based on the underlying theory, thus supporting the validity of the Turkish MOGQ.

### Internal Consistency Reliability

In terms of reliability of the Turkish MOGQ, the Cronbach's alpha coefficients were high for MOGQ dimensions (0.91 for coping/

Table 2.  
Summary of the Results from the EFA and CFA on the Motives for Online Gaming Questionnaire (MOGQ), Cronbach's Alpha Obtained from the Whole Sample (n=752)

Itema	Factor loadings <sup>c</sup>						Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted	Factor Loadings
	1 Coping/Escape	2 Recreation	3 Fantasy	4 Skill D.	5 Social	6 Competition			
23. Escape	0.882						0.777	0.896	0.850
2. Escape	0.862						0.772	0.898	0.795
25. Coping	0.812			0.301			0.754	0.899	0.787
11. Coping	0.806						0.745	0.900	0.761
9. Escape	0.771						0.739	0.900	0.715
16. Escape	0.660		0.430				0.698	0.905	0.690
4. Coping	0.430	0.382					0.677	0.907	0.781
14. Recreation		0.976					0.869	0.867	0.924
21. Recreation		0.966					0.853	0.881	0.901
7. Recreation		0.940					0.808	0.916	0.847
18. Coping	0.347	-0.375							
13. Fantasy			0.906				0.802	0.828	0.789
20. Fantasy			0.889				0.777	0.842	0.762
6. Fantasy			0.726				0.680	0.875	0.786
27. Fantasy			0.689				0.749	0.850	0.893
19. Skill D.				0.952			0.816	0.878	0.839
26. Skill D.				0.944			0.830	0.873	0.860
12. Skill D.				0.884			0.825	0.875	0.882
5. Skill D.				0.725			0.721	0.911	0.779
1. Social					0.991		0.744	0.821	0.731
8. Social					0.942		0.796	0.794	0.811
22. Social					0.726		0.736	0.819	0.868
15. Social					0.480		0.613	0.877	0.894
24. Competition						0.980	0.806	0.847	0.813
17. Competition						0.900	0.744	0.871	0.774
10. Competition						0.756	0.781	0.857	0.850
3. Competition		0.308					0.728	0.876	0.824
Cronbach's alfa	0.91	0.92	0.88	0.91	0.87	0.89			
CR	0.90	0.97	0.88	0.93	0.88	0.89			
AVE	0.58	0.94	0.65	0.78	0.66	0.67			
Original scale	0.94	0.92	0.92	0.94	0.94	0.95			
Eigenvalue	12.720	2.438	1.676	1.435	1.099	1.039			
Variance % <sup>b</sup>	47.111	9.028	6.207	5.316	4.070	3.849			
Mean	16.75	10.53	7.37	9.30	7.12	10.22			
SD	7.55	3.83	4.29	4.92	3.71	4.90			

Skill D.: skill development; CR: composite reliability; AVE: average variance extracted; SD: standard deviation.

EFA: exploratory factor analysis (maximum likelihood extraction with promax rotation with Kaiser Normalization)

a: Full description of items were omitted from the table for the sake of clarity.

b: Percentage of the total variance has been explained.

c: Six factors could be extracted from the EFA after seven iterations.

escape; 0.92 for recreation; 0.88 for fantasy; 0.91 for skill development; 0.87 for social; 0.89 for competition) (Table 2). Moreover, the

Cronbach's alpha did not increase by deleting any of the items of the subscales (Table 2). Furthermore, item-dimension correlations

Table 3.

*Correlations Between the MOGQ Dimensions, Correlations of the MOGQ Dimensions with IGDS9-SF, EGMQ and Average Gaming Time*

MOGQ	Coping/Escape	Recreation	Fantasy	Skill D.	Social	Competition
Coping/Escape	-	0.556	0.654	0.619	0.615	0.582
Recreation		-	0.381	0.536	0.350	0.594
Fantasy			-	0.561	0.585	0.494
Skill Development				-	0.615	0.666
Social					-	0.530
IGDS9-SF	0.641	0.362	0.574	0.487	0.577	0.526
Average gaming time*	0.418	0.469	0.321	0.421	0.375	0.429
<b>EGMQ</b>						
Enhancement	0.526	0.647	0.419	0.491	0.380	0.499
Social	0.549	0.351	0.496	0.566	0.700	0.489
Coping	0.741	0.400	0.532	0.406	0.417	0.410
Self-gratification	0.631	0.399	0.601	0.610	0.605	0.586

All correlations are significant at the level of  $p < 0.001$ . MOGQ: Motives for Online Gaming Questionnaire; EGMQ: Electronic Gaming Motives Questionnaire; IGDS9-SF: Internet Gaming Disorder Scale- Short Form; \*Spearman's Correlation coefficient between average gaming time and IGDS9-SF=0.446.

for the MOGQ were significant, ranging between moderate to high (Table 2).

## Discussion

The present study's primary objective was to evaluate the Turkish MOGQ's psychometric characteristics. To accomplish this goal, the MOGQ was evaluated in a cross-sectional research using an internet survey to enroll Turkish college students and individuals who habitually played online games, both as an amateur or as a professional. The findings of the present study support the validity of the MOGQ.

Demetrovics et al. (2011) applied a combined method of EFA and CFA, which principally confirmed their preliminary, theoretically developed model created along the content analysis of motivational items. However, while the coping – escape dimension comprised two separate, though, highly correlated factors; the theoretical model, which suggested coping and escape as a single dimension, had to be modified. Thus, they identified seven motivational factors (social, escape, competition, coping, skill development, fantasy, and recreation), which were used to develop the 27-item MOGQ. Interestingly, our results supported the original theoretical model, where coping and escape dimension is considered as a single factor (coping-escape). Thus, the six-factor solution for the MOGQ was found across both EFA and CFA. The findings of the EFA and CFA, both conducted on the same sample, produced statistically important and comparatively high factor loadings, showing that all items were appropriate indicators of the dimensions of motivation and that the scale has appropriate psychometric characteristics in addition to a strong factor structure. Future studies should not conduct EFA and CFA on the same sample, unless the authors want to test if their results are consistent with the theoretical model and the results of the present study, which suggest coping and escape dimensions as a single dimension; or if their results are consistent with previous studies (Wu et al., 2017, including the original study Demetrovics

et al., 2011), which suggest that coping and escape dimensions comprise two separate, however, highly correlated factors. Even while doing so, EFA and CFA should be conducted with different samples or if the sample size is large enough to split, they should be conducted with different halves of the sample.

Wu et al. (2017) in their validation study for the Chinese version of the MOGQ removed item 18 (because it helps me channel my aggression), which showed a negative loading with a standardized coefficient of  $-0.27$ . While item 18 originally was an indicator of coping motive, modification indices suggested that it might load on multiple domain-specific factors (skill development and recreation). Authors also suggested that Chinese gamers seemed less likely to consider the coping effect of online gaming for their aggressive impulses. Similarly, in the Turkish version, item 18 showed a negative loading with a standardized coefficient of  $-0.38$  for the recreation dimension and a positive loading with a standardized coefficient of  $0.35$  for the coping – escape dimension. In the EFA, whether a item receives a positive or negative loading, the highest value is accepted within its dimension. Negative loading of an item in the EFA suggests that this item creates the opposite basis for that factor. From this point of view, negatively loading, i.e., “channeling the aggressive impulses” in the recreation factor provides relief in the sense that the person suppresses the aggressive impulses. In other words, in our culture, unlike the western society, unloading the aggressive impulse does not provide relief, but suppressing it does. Thus, we decided to remove this item. Nevertheless, re-wording this item according to Turkish cultural characteristics and using all 27 items in future studies can be attempted.

In previous studies, correlation coefficients between MOGQ dimensions ranged between  $0.20$  (escape and recreation) to  $0.60$  (escape and fantasy) (Demetrovics et al., 2011) and  $0.19$  (escape and recreation) to  $0.61$  (escape and fantasy) (Király et al., 2015). In the present study it ranged between  $0.35$  (recreation and social) to  $0.67$  (skill development and competition), which

are higher than previous studies. The MOGQ dimensions previously showed adequate reliability in the original study (Cronbach's alpha ranged between 0.79 [recreation] and 0.90 [competition and social]) (Demetrovics et al. 2011). In the following study, the Cronbach's alpha ranged between 0.78 (recreation) and 0.91 (social) (Király et al., 2015) and in the Chinese version, the Cronbach's alpha ranged between 0.83 (recreation) and 0.90 (social) (Wu et al., 2017). Consistent with these Cronbach's alphas, the Turkish version obtained similar results regarding the reliability of the MOGQ dimensions (Cronbach's alpha ranged between 0.87 [social] and 0.91 [coping/escape and skill development]).

In the previous study, correlation coefficients of MOGQ dimensions with the Problematic Online Gaming Questionnaire (POGQ) (Demetrovics et al., 2012), which assesses problematic use of online games, ranged between 0.15 (recreation) to 0.51 (escape) (Király et al., 2015). Criterion-related validity analyses conducted for the Chinese version of MOGQ (Wu et al. 2017) showed that the general motivation was strongly associated with all three Player Experience of Need Satisfaction (PENS) (Ryan, Rigby, & Przybylski, 2006), subscale scores (in-game competence, in-game autonomy, and in-game relatedness ranged between 0.55 to 0.63), as well as gaming time ( $r=0.59$ ). The particular factors, on the other side, which are independent of general motivation, mainly showed mild to moderate correlations with the PENS subscales and gaming time. Similarly, in the present study, criterion-related and convergent validity were supported by the expected positive pattern of correlations that have emerged between the MOGQ and all the related measures. The convergent validity of the scale was indicated by the significant correlations of the MOGQ with the IGDS9-SF and the EGMQ dimensions, whereas the criterion-related validity of the scale was indicated by the significant correlation with the average daily time spent gaming during the last year. In general, higher mean scores on the scale dimensions indicated greater average daily time spent on games and higher severities of IGD and motivation for gaming. The MOGQ provided a valid and reliable measure of online gaming motives among young adult male and female gamers. Overall, the results obtained in the present study corroborated prior validity studies on the MOGQ (Demetrovics et al., 2011, Wu et al., 2017).

### Limitations

The present study has several limitations. First, using an online survey excludes individuals who have no internet access. Therefore, these results may not be generalized to individuals who, owing to lack of internet access, mostly play offline games. Second, since all individuals were self-selected, it is not possible to generalize the current results to the general population. Third, the research may also be limited by the reality that all information was gathered using self-reported questionnaires, a technique that is subject to well-known related biases, such as social desirability biases, short-term recall biases, etc.

Despite these possible limitations, the results of the Turkish MOGQ's validity and reliability testing were found to be comparable to prior study findings. The present findings support the Turkish version of the MOGQ which measures a six dimensional construct, as being a valid and reliable screening tool in

assessing the symptoms of online gaming motives among young adults.

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**Ethics Committee Approval:** Ethics committee approval was received for this study from the Ethics Committee of the Çankaya University (date: 14 February 2019; no: 80281877-605.01).

**Informed Consent:** Written informed consent was obtained the students and gamers who participated in this study as online.

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