Turkish Journal of Sport and Exercise
http://dergipark.gov.tr/tsed
Year: 2019 - Volume: 21 - Issue: 2 - Pages: 281-294
DOI: 10.15314/tsed.563111

ISSN: 2147-5652

Participation Motivation Scale for E-Sports: The Study of Validity and Reliability (PMSES)

Mehmet GÜL[1], Oğuzhan GÜL[2], Recep Nur UZUN[3]

[1]*School of Physical Education and Sports, Sivas Cumhuriyet University, Sivas, Turkey*
[2]*Faculty of Sports Sciences, Erciyes University, Kayseri, Turkey*
[3]*Faculty of Yaşar Dogu Sports Sciences, Ondokuz Mayıs University, Samsun, Turkey*
Address Correspondence to O. Gül, e-mail: ogulsivas@gmail.com

Abstract

Electronic sports appeared in the world in the late 1970s and gained popularity in the 2000s. In Turkey, on the other hand, the popularity and the number of players has increased after 2008. In this study, the Participation Motivation Scale for E-Sports (PMSES) was developed in order to evaluate the motivation for participation of those who do E-Sports. The research included 590 participants that play various E-Sports games. The research was designed as the structural equation and mixed model. Within the scope of the structural validity of the scale, exploratory factor analysis (EFA) was carried out in the SPSS 23, and confirmatory factor analysis (CFA) was applied to the measuring instrument in AMOS Software. The Kaiser-Meyer-Olkin (KMO) value was found to be 0.975 and the sample size was found to be sufficient. As a result of the factor analysis applied regarding the validity of the scale, three factors representing 78.847% of the total variance were obtained. The Cronbach Alpha coefficient was calculated as 0.972 as a result of the reliability analysis of the 22-item scale. It can be said that the Participation Motivation Scale for E-Sports (PMSES) is a valid and reliable data collection tool that can measure the participation motivation of the individuals who do E-Sports.

Keywords: Electronic Sports, Participation Motivation, Structural Equation Model, Mixed Model, Factor Analysis

INTRODUCTION

Motivation, which is also called the motive psychology, is the driving force behind the movements of the individual (31). Besides, motivation means an individual's awareness of their wishes and needs and taking action to realize these. There are some factors that affect motivation positively or negatively (8). Depending on the positive or negative factors in question and the nature and intensity of the motives in our lives, all our behaviors gain direction or change continuously (6). For instance, athlete conducts various behaviors to be successful and to achieve his/her goals (4). It is a fact that the inherent competitiveness of sports is generally considered to stem from motivation (24). Therefore, it is quite clear that motivation is very important especially in sports (28). For this reason, motivation is one of the basic subjects of sports psychology and it has an important role in explaining behaviors in the sports environment. In particular, the efforts to develop explanatory approaches related to reasons for participating in a sports activity, maintaining participation, and quitting are noteworthy (12). If we think that the main motives that affect the participation of individuals in sports activities affect the continuation and termination of participation; determining these motives is going to be an important step in increasing participation.

Electronic sports are a sports branch in which amateur-professional players compete with each other through computer or game consoles. Computer systems mediate the games of players and teams. The game is played on a virtual platform. In other words, the computer system is as much important for Electronic sports as stadiums are for football.

Electronic sports games have become a thriving phenomenon via online media, the world's fastest growing media type. Attracting 70 million spectators in 2013, this sports branch is estimated to have attracted 400 million spectators in 2016 (22; 33).

Some people in the world advocate that electronic sports are not a kind of sports. The main reason for this idea is that electronic athletes do not compete with any physical activity. It is a common belief that sports cannot be done by sitting on an armchair and that there must be physical activity in the sports. However, there is also a physical activity in electronic sports. Athletes are required to optimize their reflexes, brain functions, and hand-eye coordination in order to be successful in the games they perform (34). In addition to this, the competition, teams, fans, sports halls, products etc. necessitate E-Sports being considered a sports branch (10; 27).

As in non-electronic sports, there are various branches in electronic sports as well. Electronic sports are divided into FPS (First-person shooter), RTS (real-time strategy), Sport-Racing Games, MOBA (Massively Online Battle Arena) and other e-sports games (World of Tanks, Hearthstone, etc.). Virtual versions of traditional sports games are also performed as electronic sports (13; 27).

First-Person Shooter Games

First-person shooter games are games that can be played both individually and as a team. The players direct the digital game environment through the virtual characters they create. In this type of game, the age limit is generally determined to be +18. These game types offer a wide range of areas to players from realistic contents like military simulation to fun, exciting and fantastic worlds. The qualifications required to be successful in this type of games for players are reflexes, making quick judgments and team management (E.g. Overwatch, Counter-Strike, Quake, Zula, Crossfire) (27).

The companies operating in Turkey for major games in this genre are as follow:

- Point Blank (*nFinity Games, S. KOREA*)
- Wolfteam (*Netmarble, S. KOREA*)
- Zula (*In Game Group, Madbyte Games*)
- Counter Strike Global Offensive (*Valve, USA*)
- Overwatch (*Blizzard Entertainment, USA*)

Real-Time Strategy

These games are played individually most of the time and sometimes are played as a team. In these games, the players build an army by making use of the available resources. With their army in the virtual environment, the players try to defeat their rivals' armies (E.g. Star Craft) considering many factors simultaneously (timing, land conditions, production timing, and resource management) (27).

Sport-Racing Games

It is an adapted form of traditional sports in the virtual environment. E-Sports companies with the licensing agreements with various sports federations have made famous sports clubs and athletes available to the virtual platform with their realistic features. For instance, a player can choose the latest squads and then play with teams such as Manchester United, Real Madrid or Galatasaray. Virtual motorsports are also considered within this type of game (E.g. Pro Evolution Soccer, FIFA, UFC, Track-mania, Fight-Night, NBA 2K17) (27).

MOBA (Massively Online Battle Arena)

This type of games is played by trying to destroy each other's energy sources on a map of three main roads between two rival teams, usually consisting of five people (27).

It is an electronic sports branch that has a massive group of players, and that is the most popular E-Sports branch not only in Turkey but also in the world today. The fact that the brands such as DOTA II and League of Legends, which can be run on any computer, can be played in fast as a team, has made it easier for such games to become

widespread. Thanks to the offices set up and the investments made by Riot Games in 2012, electronic sports have developed more rapidly in Turkey (27).

The companies operating in Turkey for major games in this genre are as follow:

- League of Legends (*Riot Games, China-USA, Turkey Office available*)
- Strike of Kings (*Tencent, China*)
- DOTA II (*Valve, USA*)
- MMORPG: (Massively Multiplayer Online Role-Playing Game) Role-playing games that can be played connecting to any server (27).

Other E-Sports Games

Popular games out of the category are:

- Hearthstone: The card game that takes the popular game characters as the theme. (Not to be confused with gambling and betting games) (*Blizzard, USA*) (27).
- World of Tanks: An action and strategy game that can be played individually or as a team, on virtual maps with tanks that belong to World War II times. (*Wargaming, White Russia*) (27).

Electronic sports offer an environment where people from the far end of the world meet via the internet or by coming from different parts of the world to meet people in big organizations (3). For this reason, E-Sports spectators and followers show an increase over the years. Award-winning tournaments started to show interest in competitive games increased (19). As a matter of fact, electronic sports have reached a huge budget of $ 905 million and it is predicted to increase to a budget of $ 1.4 billion in the 2020s (23). Therefore, it is important to make a validity and reliability study of Participation Motivation Scale for E-Sports (PMSES) for these sports, which seems to be in the life of many individuals in this generation and the next generations.

MATERIAL and METHOD

In this section, information about the model used in the research, the research group and the development process of the measuring instrument are given.

Research Model

In this study, the mixed model was used to develop a valid and reliable measuring instrument in order to measure the participation motivation of the individuals in electronic sports. Mixed studies are the studies where the qualitative and quantitative data are analyzed in a single study and the different data sources are inter-converted and verified (20).

Research Group

Individuals that are engaged in electronic sports in different branches participated in this study. In the study, the criterion sampling method (25) was used as one of the purposeful sampling methods which provide in-depth research opportunity. In the criterion sampling method, the researcher can set criteria that meet a set of predetermined values (35).The criterion of being actively engaged in various branches of E-sports during at least one year was determined for the athletes participating in the research. (Such as Zula, LoL, Cs-Go, CALL of DUTY, PubG, Wolfteam, FIFA-PES, Formula 1, WORLD of TANKS, etc.) In this context, a total of 590 people that competed in one or several various sports branches participated in the research(365 Zula, 39 LoL, 69 Cs-Go, 28 CALL of DUTY, 56 PubG, 219 Wolfteam, 65 FIFA-PES, 6 Formula 1, 10 WORLD of TANKS). Some researchers state that the size of the study group must be at least five times the number of items in the scale (1; 5; 26; 30; 32). Accordingly, it can be said that the research group, to which the 74-item scale form is administrated, has a sufficient number of participants for the statistical procedures. 8.8% (n = 52) of the participants were female and 91.2% (n = 538) of them were male.

Development Process of Measurement Instrument

In this section, the following processes were followed in order to determine the levels of e-sports participation motivation of the individuals engaged in electronic sports.

Developing an Item Pool

When developing the item pool, the studies on e-sports concept and accessible studies were reviewed. The body of literature was examined paying particular attention to the studies regarding

the motivation level on E-Sports concept. When the literature about e-sports was examined, we found that two scales are available: Kari and Karhulahti's (17) 7-item scale on the physical training in E-Sports and the 12-item scale called "E-Sports Motivation Scale: League of Legends", which was developed by Sun as a part of M.A. thesis (29).

Items from the Literature

In the first stage of developing the item pool, the scientific studies about E-Sport concept and also blog sites where e-athletes shared their views were examined. On the other hand, E-sports studies on motivation in sports, sports media, sports tourism and sports economy related to the concept of E-Sports were examined.

Items based on Focus Group Studies

In the second phase of developing the item pool, two focus group meetings were held. The first focus group meeting consisted of seven men between the ages of 20-35. The participants were university graduate, graduate students and employees. The second focus group meeting was held with a group of eleven students. Firstly, the concept of E-Sports was tried to be expressed clearly to the participants. The concept of E-Sports, its definition and its applications were explained and the participants were fully informed about the concept. The games that are within the scope of electronic sports were mentioned (Zula, LoL, Cs-Go, CALL of DUTY, PubG, Wolfteam, FIFA-PES, Formula 1, WORLD of TANKS, Clash Royal etc.). The participants were then asked for their opinions about the E-Sports games and the E-Sports concept. According to examples given, the opinions of the participants about the concept of E-Sports were asked to find out their attitudes towards the E-Sports concept.

Expert View

In the final stage of developing the item pool, the academicians who were specialized in the areas of Sports Management, Sports Economics, and Sports-Media were interviewed. Their opinions on E-Sports and their ideas about the adaptability of for the scale about the E-Sports concept were taken into consideration. The items gathered in line with the views of academicians were arranged, resulting in a large item pool consisting of 74 questions. Finally, the 74-question item pool was administrated to the individuals that are actively engaged in E-Sports, and statistical evaluations of the scale were made.

RESULTS

Findings of Exploratory Factor Analysis (EFA)

In order to determine the construct validity of the scale, explanatory factor analysis was conducted.

Table 1. Examination of the Suitability of Data for Factor Analysis

Kaiser-Meyer-Olkin (KMO) Sample Measurement Sufficiency		0.975
Bartlett's Test	**Chi-square**	15897.030
	S.d	231
	p (p<0.001)	0.000

Since the KMO coefficient is 0.975, the sample size in the study is sufficient (Table 1).

Since there is significance level (probability) in consequence of Bartlett's Test of Sphericity, the data meets the assumption of multiple normal distributions (1) and confirms the feasibility of factor analysis.

The communality is the variance value that a variable share with other variables, and it is required that each variable takes values between 1 and 0.5 (21). Communality values are given in Table 2 (below).

Table 2. Communality Values for the Items on the Scale

Questions	Communality Value	Questions	Communality Value
s69	.925	s71	.897
s45	.917	s50	.890
s59	.916	s66	.744
s53	.915	s49	.724
s39	.915	s23	.711
s74	.910	s16	.697
s46	.905	s63	.688
s54	.904	s10	.661
s48	.904	s55	.571
s61	.904	s7	.523
s68	.901	s9	.523

As a result of the exploratory factor analysis applied to 22 items remaining in the scale, a three-factor structure emerged (Table 2). The resultant factors of the analysis and the related findings are given in Table 3.

Table 3. Total Variance Explained of the Scale

Sub-dimension of the Scale	Items	Factor Loading	Eigenvalues	Variance (%)	Cumulative Varyans (%)
Intrinsic Motivation for Knowing and Achieving	s53	.893	14.505	65.931	65.931
	s69	.884			
	s71	.878			
	s59	.871			
	s74	.871			
	s68	.860			
	s45	.852			
	s48	.843			
	s39	.848			
	s46	.831			
	s54	.831			
	s61	.815			
	s50	.802			
Extrinsic Regulation	s9	.701	1.839	8.361	74.292
	s16	.655			
	s10	.664			
	s7	.761			
	s23	.604			
Identification	s55	.828	1.002	4.555	78.847
	s63	.734			
	s66	.733			
	s49	.677			

When the results of the exploratory factor analysis of the scale in Table 3 are examined, it is seen that there are 3 factors with an eigenvalue greater than 1. The variance explained by the first factor is 65.931, the variance explained by the second factor is 8.361, and the variance explained by the third factor is 4.555. The total variance explained is 78.847%. The total variance explained is sufficient as it exceeds 60% (Table 3).

Table 4. Rotated Components Matrix for Factor Structure of the Scale

Items	Components		
	1	2	3
s53	.893		
s69	.884		
s71	.878		
s59	.871		
s74	.871		
s68	.860		
s45	.852		
s48	.843		
s39	.848		
s46	.831		
s54	.831		
s61	.815		
s50	.802		
s9		.701	
s16		.655	
s10		.664	
s7		.761	
s23		.604	
s55			.828
s63			.734
s66			.733
s49			.677

In order to do confirmatory factor analysis, there must be at least three variables measuring each latent variable. For this reason, it was ensured that there were at least three variables under each factor. In addition, the items which were either overlapping or had low communality values in two or more factors were excluded from the scale and thus a 22-item scale was obtained. The results of the analysis show that the scale has construct validity (Table 4).

Naming the Factors (Nomenclature)

Since the main reason for the exploratory factor analysis is to reduce a large number of variables to a smaller number of factors, these factors which emerged must be named. This naming process is made in line with the common features of the variables in the factor (21).

The items belonging to the 3 factors obtained from the exploratory factor analysis and the appropriate nomenclature for these items are given below (Table 5).

Table 5. Naming the Factors

Item	FACTORS
First Factor: Intrinsic Motivation for Knowing and Achieving	
s53	It gives me pleasure to discover my talents in E-Sports.
s69	The experiences I discovered in E-Sports give me pleasure.
s71	It makes me happy to show my skills to others in E-Sports.
s59	The competitive environment in E-Sports excites me.
s74	I enjoy the techniques and tactics in E-Sports.
s68	I like to follow professional players and teams in E-Sports.
s45	E-Sports is a passion for me.
s48	I am having a good time with my friends in E-Sports platform.
s39	I think E-sports is exciting in terms of content.
s46	I value the friendship relationships I have established in E-Sports.
s54	I enjoy doing E-Sports in my spare time.
s61	I like to know different people and cultures by doing E-Sports.
s50	I enjoy making friends in the E-Sports platform.
Second Factor: Extrinsic Regulation	
s9	My friends' passion for E-Sports led me to E-Sports.
s16	I think E-Sports has positive effects on my education life.
s10	I feel incomplete unless I do E-Sports.
s7	My family supports my interest in E-Sports and my being an E-Sports athlete.
s23	I got positive feedback from my environment after I started to do E-Sports.
Third Factor: Identification	
s55	I feel more tired while doing E-Sports.
s63	I'm playing E-sports to invest for the future.
s66	I think E-Sport is important for my health.
s49	I think doing e-sports is enough for physical activity.

Intrinsic Motivation for Knowing and Achieving: This title is related to various structures such as explanation, curiosity, learning objectives, competence, task orientation, learning, knowing and understanding. It means that the person participates in the activity as he/she enjoys the pleasure of personal satisfaction while trying to learn, achieve, explain and understand something new (16).

Extrinsic Regulation: It is stated that the behaviors of the individual are controlled by external sources and the reasons for the participation of the person in the sport originate from the desire of earning respect and being rewarded, besides the social pressure (16).

Identification: It is stated that the individual participates in the activity because

he/she considers the behavior as important, and believes that their participation contributes to their personal development (16).

The Findings of the Confirmatory Factor Analysis

Confirmatory factor analysis was carried out in order to examine the goodness of fit and construct validity of the structure, which was determined to be composed of 3 factors by exploratory factor analysis and the following results were obtained.

When testing the compatibility between the model and the data, it may be preferable to use some or all of the goodness of fit tests (20). However, there is no consensus in the literature regarding which of this goodness of fit statistics should be used (15).

Table 6. Fit Indices used in Confirmatory Factor Analysis

Model Compatibility Criteria	Goodness of Fit	Acceptable Fit	Obtained Value
CMIN/SD	χ /sd ≤ 3	χ /sd ≤ 5	4.124
		Comparative Fit Indices	
TLI (NNFI)	0.95 ≤ NNFI	0.90 ≤ NNFI	.954
IFI	0.95 ≤ IFI	0.90 ≤ IFI	.959
CFI	0.97 ≤ CFI	0.95 ≤ CFI	.959
RMSEA	RMSEA ≤ 0.05	RMSEA ≤ 0.08	.073
		Residual Baseline Fit Indices	
RMR	$0 < RMR \leq 0.05$	$0 < RMR \leq 0.08$	.055
		Absolute Fit Indices	
GFI	0.90 ≤ GFI	0.85 ≤ GFI	.883
AGFI	0.90 ≤ AGFI	0.85 ≤ AGFI	.857

As it can be seen in Table 6, $\chi^2/df = 4.124 < 5; 0.912 < IFI = 0.913;$ $0.954 < TLI = 0.955; 0.959 < CFI\ 0.960; RMSEA = 0.073 < 0.08;$ $RMR = 0.055 < 0.08$ the model according to fit values shows an acceptable fit with the data. Therefore, the validity of the 3-factor structure revealed by exploratory factor analysis was confirmed by confirmatory factor analysis as well. In other words, the scale can be used to measure the participation levels of electronic sports athletes in electronic sports (Table 6).

Regression Weights of the Model

The following table shows the regression weights. The regression values show the observed variables' power of estimation about the latent variables, in other words, factor loadings. Since the "p" value for each binary relation below is less than 0.05, the factor loadings are important. The factor loadings that were found important indicate that the items have been properly loaded on the factors.

Table 7. Regression Weights Related to the Model

	Estimate	S.E (Standard Error)	C.R. (Critical Ratio)	P
s50←F1	1.000			
s61←F1	1.011	.030	34.146	***
s54←F1	1.035	.030	34.968	***
s46←F1	1.053	.030	34.731	***
s39←F1	1.059	.029	36.421	***
s48←F1	1.025	.029	35.003	***
s45←F1	1.076	.030	36.453	***
s68←F1	1.043	.029	35.703	***
s74←F1	1.048	.028	36.831	***
s59←F1	1.067	.028	37.504	***
s71←F1	1.048	.029	36.064	***
s69←F1	1.084	.028	38.729	***
s53←F1	1.086	.028	38.303	***
s23←F2	1.000			
s7←F2	.881	.056	15.603	***
s10←F2	.989	.055	18.114	***
s16←F2	1.038	.051	20.513	***
s9←F2	.856	.061	13.993	***
s49←F3	1.000			
s66←F3	1.061	.039	27.357	***

Table 7. Regression Weights Related to the Model

	Estimate	S.E (Standard Error)	C.R. (Critical Ratio)	P
s63←F3	.954	.043	22.306	***
s55←F3	.926	.047	19.593	***

***=p<0.001

Another important case in confirmatory factor analysis is the estimation values of regression weights. The following table provides standardized regression weights coefficients. The regression values show the observed variables' power of estimation about the latent variables, in other words, factor loadings (Table 7).

Table 8. Standardized Regression Coefficients

Relation	Estimate	Relation	Estimate
S50←F1	.887	S69←F1	.946
S61←F1	.903	S53←F1	.943
S54←F1	.911	S23←F2	.790
S46←F1	.909	S7←F2	.636
S39←F1	.926	S10←F2	.723
S48←F1	.912	S16←F2	.804
S45←F1	.926	S23←F2	.578
S68←F1	.919	S49←F3	.838
S74←F1	.930	s66←F3	.904
S59←F1	.936	s63←F3	.786
S71←F1	.922	S55←F3	.717

The AMOS diagram of the model obtained from the confirmatory factor analysis is given in Figure 1.

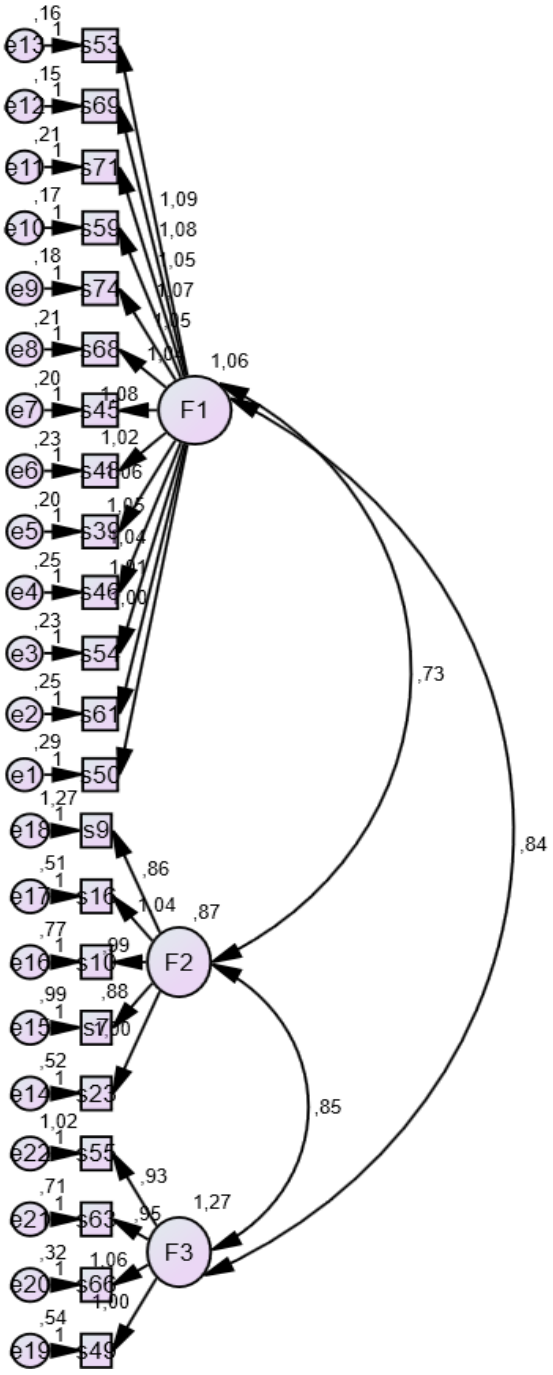

Figure 1. AMOS Diagram of the Model

Normality, Reliability and Validity of Data

The fact that the significance value is found below 0.01 in the wake of the Bartlett Test of Sphericity indicates that multiple normal distribution assumptions of the data are provided (1; 11).

In order to analyze the construct validity of the data, exploratory factor analysis was carried out initially, and then confirmatory factor analysis was used for the discriminant validity (7).

Internal consistency analysis (ICA) was also performed. One of the main assumptions in the Likert-type scale development studies is that there is a monotonic relationship between the attitude to be measured and each item in the scale. In other words, there is an assumption that each item basically measures the same attitude (30). For this reason, it is appropriate to use Cronbach's alpha, which is accepted as the internal consistency

measure (criterion) in order to determine the reliability level when developing a Likert-type scale. The Cronbach's alpha (coefficient a) is between 0 and 1, and the higher the coefficient a, the more the items in the scale are considered to be consistent, which also means that they measure the elements of the same feature (32).

The reliability levels according to Cronbach's alpha values were given below.

- In a condition of $0.00 \leq \alpha < 0.40$ the scale has no reliability,
- In a condition of $0.40 \leq \alpha < 0.60$ the scale has low reliability,
- In a condition of $0.60 \leq \alpha < 0.80$ the scale is quite reliable,
- In a condition of $0.80 \leq \alpha < 1.00$ the scale is highly reliable (32).

The internal consistency of the scale is given in table 9 below, both as factors and as the whole of the scale.

Table 9. Internal Consistency Coefficients of the Scale

Factors	Item Numbers	Cronbach's Alpha Internal Consistency Coefficient
(F1) Intrinsic Motivation for Knowing and Achieving	s39, s45, s46, s48, s50, s53, s54, s59, s61, s68, s69, s71 and s74	.986
(F2) Extrinsic Regulation	s7, s9, s10, s16 and s23	.833
(F3) Identification	s49, s55, s63 and s66	.885

According to the data in Table 9, since the reliability levels of all factors were found to be [F1 α = 0.986; F2 α=0.833; F3 α=0.885], of all items was [α=0.971 – 0.969] and the Cronbach's Alpha Internal Consistency Coefficient of the whole 22-item scale was [α=0.972], it is found to be highly reliable (Table 9).

CONCLUSION

In this study, a valid and reliable measurement tool has been developed in order to measure the participation motivation of the individuals in e-sports.

In order to develop the measuring instrument, a 74-item pool has been created after the literature review, the focus group studies and taking expert advice.

In order to ensure the construct validity of the Participation Motivation Scale for E-Sports in the SPSS 23, alpha factor analysis (AFA), and confirmatory factor analysis (CFA) was performed in AMOS Software. For the exploratory factor analysis, The Kaiser-Meyer-Olkin coefficient and Barlett's test were applied, the KMO coefficient value was found to be 0.975 and with these results, the suitability of the data for factor analysis has been demonstrated. As a result of EFA, 22 items explaining 78.847% of the total variance were obtained. As a result of the rotated principal components analysis, a structure consisting of 3 sub-dimensions was obtained. These are "Intrinsic Motivation for Knowing and Achieving", "Extrinsic Regulation" and "Identification" factors. In the results of the confirmatory factor analysis of the Participation Motivation Scale for Electronic Sports (PMSES), the fit index values related to PMSES were found as: $\chi^2/df = 4.124 < 5$; $0.912 < IFI = 0.913$; $0.954 < TLI = 0.955$; $0.959 < CFI = 0.960$; $RMSEA = 0.073 < 0.08$; $RMR = 0.055 < 0.08$. According to the range of acceptable variance and good variance, three sub-dimensions obtained from the confirmatory factor analysis of the Participation Motivation Scale for E-Sports (PMSES) seem to have adequate fit indices. In order to determine whether the items in the sub-dimensions of the scale measure the desired feature, the test correlations of the items and the lower 27% and higher 27% group were compared. As a result of these analyses, it was detected that the items in the scale were highly discriminant. It is seen that the item-total correlation values ranged between 0.604 and 0.893. These results show that each item is fully compatible with the scale. In order to test the reliability of the scale, Cronbach's Alpha internal consistency coefficient was calculated, thus the internal consistency coefficient in the scale was found to be 0.972. The coefficient was found to be 0.986 in "intrinsic motivation for knowing and achieving" sub-dimension, it was found to be 0.833

in "extrinsic regulation" sub-dimension, and it was found to be 0.885 in the "identification" sub-dimension. This value is higher than 0.60, the lowest acceptable reliability in the literature (18; 14). Alpar (2) stated that the scales that have a Cronbach's Alpha internal consistency coefficient between 0.60 and 0.80 can be called reliable. In this context, based on the reliability analysis of the current scale, the scale and its sub-dimensions have been proven to be highly reliable. As a result, PMSES can be defined as a valid and reliable measurement tool for determining the source of motivations of individuals participating in E-Sports by playing games such as Zula, LoL, Cs-Go, CALL of DUTY, PubG, Wolfteam, FIFA-PES, Formula 1, WORLD of TANKS etc.

REFERENCES

1. Akgül, A., & Çevik, O. İstatiksel Analiz Teknikleri, SPSS'te İşletme Yönetimi Uygulamaları. Emek Ofset, Ankara/ Türkiye. 2003.
2. Alpar, R. Spor bilimlerinde uygulamalı istatistik. Nobel Yayınları, Ankara/ Türkiye, 2006.
3. Argan, M., Özer, A. & Akın, E. Elektronik Spor: Türkiye'deki Siber Sporcuların Tutum ve Davranışları. Spor Yönetimi ve Bilgi Teknolojileri Dergisi, 2006; 1(2), 1306-4371.
4. Arkonaç S. A. Psikolojide zihin süreçleri bilimi. Alfa Yayınları, Ankara 1998.
5. Balcı, A. Sosyal Bilimlerde Araştırma Yöntem Teknik ve İlkeler. Pegem-Yayınları. Ankara/ Türkiye, 2005.
6. Baştuğ G. Sporda psikolojik motivasyon faktörü olarak ödül ve cezanın cinsiyet ve spora başlama yaşı değişkenine göre incelenmesi. Yüksek Lisans Tezi, Selçuk Üniversitesi Sağlık Bilimleri Enstitüsü. Konya, 2002.
7. Bollen, K. A. Structural Equations with Latent Variables. New York: John Wiley & Sons. Journal of Korean Academy of Nursing, 1989; 29(5).
8. Can Y, Güven H, Soyer F, Demirel M, Bayansalduz M. & Şahin K. Elit taekwondo sporcularında aile antrenör, kulüp desteği ve başarı motivasyonu arasındaki ilişkinin incelenmesi. Uluslararası İnsan Bilimleri Dergisi, 2009; 6(2): 240-252.
9. Creswell, J. W., & Creswell, J. D. Research design: Qualitative, quantitative, and mixed methods approach. 4. Edition, Sage publications, 2017.
10. Gençlik Spor Bakanlığı. E-Spor Raporu. Nisan 2018 tarihinde http://www.gsb.gov.tr/HaberDetaylari/1/138762/genclik-ve-spor-bakanligindan-e-spor-raporu.aspx adresinden alınmıştır, 2018.
11. Hair, J. F., Anderson R. E., Tahtam R. L. & Black W. C. Multivariate Data Analysis. Prentice Hall International Inc., New Jersey, 1998.
12. Hardy, L., Jones, J. G., & Gould, D. Understanding psychological preparation for sport: Theory and practice of elite performers. John Wiley & SonsInc, 1996.
13. Hamari, J., & Sjöblom, M. What is Esports and Why do People Watch it?. Internet Research. 2017. 27(2), 211-232.
14. Highlen, P. S., & Bennett, B. B. Elite divers and wrestlers: A comparison between open-and closed-skill athletes. Journal of sport psychology, 1983; 5(4), 390-409.
15. İlhan, M. & Çetin B. Lısrel ve Amos Programları Kullanılarak Gerçekleştirilen Yapısal Eşitlik Modeli (YEM) Analizlerine İlişkin Sonuçların Karşılaştırılması. Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi, 2014; 5(2), 26-42.
16. Kazak, Z. Sporda Güdülenme Ölçeği SGÖ'nin Türk Sporcuları İçin Güvenirlik ve Geçerlik Çalışması. Hacettepe Üniversitesi Spor Bilimleri Dergisi, 2004; 15(4), 191-206.
17. Kari, T. & Karhulahti, V. M. Do E-Athletes Move: A Study on Training and Physical Exercise in Elite E-Sports. International Journal of Gaming and Computer-Mediated Simulations (IJGCMS), 2016;. 8(4), 53-66.
18. Klint, K. A. & Weiss, M. R. Perceived Com-Petence and Motives for Participating in Youth Sports: A Test of Harter's Competence Motivation Theory. Journal of sport Psychology, 1987; 9(1), 55-65.
19. Kocadağ, M. Elektronik Spor Kariyeri ve Eğitim. Doğu Anadolu Sosyal Bilimlerde Eğilimler Dergisi, 2017; 1(2), 2564-7202.
20. McMillian, J. H., & Schumacher, S. Research in Education: evidence-based inquiry. Pearson/Allyn and Bacon, 2006.
21. Nakip, M. Pazarlamada Araştırma Teknikleri. Seçkin Yayıncılık, 3, Ankara/ Türkiye, 2013.
22. Newzoo. Global Games Marketting Report An Overview Of Trends and Insights. Nisan 2017 tarihinde https://newzoo.com/insights/articles/global-games-market-reaches-99-6-billion-2016-mobile-generating-37/ adresinden alınmıştır. 2016.
23. Newzoo. Global E-sports Marketting. Report Eylül 2018 tarihinde https://newzoo.com/insights/trend-reports/global-esports-market-report-2018-light/ adresinden alınmıştır, 2018.
24. Özgün A, Yaşartürk F, Ayhan B. & Bozkuş T. Examination of handball players levels of sports specific achievement motivation and happiness. Uluslararası Kültürel ve Sosyal Araştırmalar Dergisi, 2017; 3(2): 83-94.
25. Patton, M. Q. Nitel Çalışma ve Değerlendirme Yöntemleri. Pegem Yayıncılık. Ankara/ Türkiye 2014.
26. Pett, M. A., Lackey, N. R., & Sullivan, J. J. Making Sense of Factor Analysis: The Use of Factor Analysis for Instrument Development in Health Care Research. Sage. 2003.
27. Uluslararası Çocuk ve Bilgi Güvenliği Etkinlikleri. Dijital Dünyada Rekabet. Dijital Oyunlar Çalıştayları. Ankara: 2017
28. Soyer F, Can Y, Güven H, Hergüner G, Bayansalduz M. & Tetik B. Sporculardaki başarı motivasyonu ile takım birlikteliği arasındaki ilişkinin incelenmesi. Uluslararası İnsan Bilimleri Dergisi, 2010; 7(1): 225-239.
29. Sun, Y. Motivation To Play Esports: Case of League of Legends. School of Hotel. Restaurant and Tourism Management. Calorina, 2017.
30. Tavşancıl, E. Tutumların Ölçülmesi ve Spss İle Veri Analizi. Ankara: Nobel Yayınevi 2014.
31. Tosun A., Demir B., Uçkun C. G. & Konak O. Spor aktivitelerinin üniversite öğrencilerinin başarı ve motivasyonunu ile ilişkisi. Uluslararası Meslek Yüksekokulları Sempozyumu, 2015; 1-11.

32. Tezbaşaran, A. A. Likert Tipi Ölçek Geliştirme Kılavuzu. Türk Psikologları Derneği Yayınları. Ankara/Türkiye, 2008
33. Warr, P. Esports in Numbers: Five Mind-blowing Stats. Nisan 2017 tarihinde RedBull http://www.redbull.com/en/esports/stories/133164462838 9/esports-in-numbers-five-mind-blowing-stats adresinden alınmıştır, 2014.
34. Witkowski, E. On the Digital playing Field: How we "Do Sport" With Networked Computer Games. Games and Culture. 2012; 7(5), 349-374.
35. Yıldırım, A., & Şimşek, H. Sosyal Bilimlerde Nitel Araştırma Yöntemleri. Ankara: Seçkin Yayınları, 2011.

Participation Motivation Scale for E-Sports	I strongly disagree	I disagree	I'm undecided	I agree	I strongly agree
(*F1*)-1	It gives me pleasure to discover my talents in E-Sports.				
(*F1*)-2	The experiences I discovered in E-Sports give me pleasure.				
(*F1*)-3	It makes me happy to show my skills to others in E-Sports.				
(*F2*)-4	My friends' passion for E-Sports led me to E-Sports.				
(*F2*)-5	I got positive feedback from my environment after I started to do E-Sports.				
(*F3*)-6	I think doing E-Sports is enough for physical activity.				
(*F1*)-7	I like to follow professional players and teams in E-Sports.				
(*F1*)-8	E-Sports is a passion for me.				
(*F1*)-9	I am having a good time with my friends in E-Sports platform.				
(*F3*)-10	I'm playing E-sports to invest for the future.				
(*F2*)-11	I feel incomplete unless I do E-Sports.				
(*F1*)-12	The competitive environment in E-Sports excites me.				
(*F3*)-13	I think E-Sport is important for my health.				
(*F1*)-14	I value the friendship relationships I established in E-Sports.				
(*F1*)-15	I enjoy doing E-Sports in my spare time.				
(*F1*)-16	I like to know different people and cultures by doing E-Sports.				
(*F3*)-17	I feel more tired while doing E-Sports.				
(*F2*)-18	My family supports my interest in E-Sports and my being an E-Sports's athlete.				
(*F1*)-19	I enjoy the techniques and tactics in E-Sports.				
(*F2*)-20	I think E-Sports has positive effects on my education life.				
(*F1*)-21	I think E-sports is exciting in terms of content.				
(*F1*)-22	I enjoy making friends in the E-Sports platform.				

E-Spor Katılım Motivasyon Ölçeği	Kesinlikle Katılmıyorum	Katılmıyorum	Kararsızım	Katılıyorum	Kesinlikle Katılıyorum
(*F1*)-1	E-Sporda yeteneklerimi keşfetmek bana haz veriyor.				
(*F1*)-2	E-Sporda keşfettiğim deneyimler bana haz veriyor.				
(*F1*)-3	E-Sporda yeteneklerimi başkalarına göstermek bana mutluluk veriyor.				
(*F2*)-4	Arkadaşlarımın E-Spor tutkuları beni E-Spora yönlendirdi.				
(*F2*)-5	E-Sporu yapmaya başladıktan sonra çevremden olumlu tepkiler aldım.				
(*F3*)-6	E-Spor yapmak, fiziksel aktivite için yeterli olduğunu düşünüyorum.				
(*F1*)-7	E-Sporda profesyonel seviyedeki oyuncu ve takımları takip etmekten hoşlanırım.				
(*F1*)-8	E-Spor yapmak benim için bir tutkudur.				
(*F1*)-9	E-Spor ortamında arkadaşlarımla iyi vakitler geçiyorum.				
(*F3*)-10	E-Sporu geleceğe yatırım yapmak için oynuyorum.				
(*F2*)-11	E-Spor yapmazsam kendimi eksik hissederim.				
(*F1*)-12	E-Spordaki rekabet ortamı beni heyecanlandırıyor.				
(*F3*)-13	E-Sporun, sağlığım için önemli olduğunu düşünüyorum.				
(*F1*)-14	E-Sporda kurduğum arkadaşlık ilişkilerime değer veriyorum.				
(*F1*)-15	Boş vakitlerimde E-Spor yapmaktan haz alıyorum.				
(*F1*)-16	E-Spor yaparak farklı kişi ve kültürleri tanımaktan haz alıyorum.				

(*F3*)-17	E-Spor yaparken daha fazla yorulduğumu hissediyorum.
(*F2*)-18	Ailem E-Spora ilgimi ve E-Sporcu olmamı destekliyor.
(*F1*)-19	E-Spordaki teknik ve taktiklerden haz alıyorum.
(*F2*)-20	E-Sporun eğitim hayatıma olumlu etkileri olduğunu düşünüyorum.
(*F1*)-21	E-Sporlar içerik bakımından heyecan verici olduğunu düşünüyorum.
(*F1*)-22	E-Spor ortamında arkadaş edinmekten zevk alıyorum.