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Validity and Reliability Study of the E-Sports Awareness Scale

Doğukan BALTA[1], Aydın PEKEL[2]

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ORIGINAL ARTICLE

[1]Graduate student at Gelişim University, İstanbul/Türkiye

[2]Marmara University, Faculty of Sport Science İstanbul/Türkiye

Abstract

The present study aims to develop a valid and reliable measurement tool for assessing the attitudes and behaviors of society and athletes with regard to e-sports awareness. The study population comprises volunteers residing in Istanbul who have played e-sports games for a minimum of one year. The sample comprises 179 volunteer participants. Exploratory and confirmatory factor analyses were conducted using the IBM SPSS 25 and Lisrel 8.80 software packages. Prior to conducting the exploratory factor analysis, the suitability of the data for factor analysis was evaluated through the application of the KMO and Barlett tests, which yielded a KMO value of 0.862. An exploratory factor analysis was conducted to reveal the construct validity of the scale. The factor analysis yielded a scale comprising 10 items. In the factor analysis, the items were grouped under a single factor, with a total explained variance of 53.364% and an eigenvalue greater than 1. The results of the confirmatory factor analysis (CFA) indicated that the value of χ^2/sd, one of the fit indices of the model, was 1.43. Furthermore, the fit indices indicated a good fit with the single-factor structure of the scale. The Cronbach alpha value for the scale was determined to be 0.840. In conclusion, it was established that the E-sports awareness scale, developed to assess awareness towards E-sports, is a valid and reliable measurement tool. The scale consists of 10 items.

Keywords: E-Sports, Sports, Gaming, Digital Gaming.

Corresponding Author:
Aydın PEKEL
aydin.pekel@marmara.edu.tr

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E-Spor Farkındalık Ölçeği Geçerlik ve Güvenirlik Çalışması

Öz

Bu araştırmanın amacı, toplumun ve sporcuların e-spor farkındalığı ile ilgili tutum ve davranışlarını ölçmeye yönelik geçerli ve güvenilir bir ölçme aracı geliştirmektir. Araştırmanın evrenini, İstanbul İlinde en az 1 yıl e-spor oyunları oynamış gönüllü bireyler oluşturmaktadır. Örneklemi ise (n=179) gönüllü katılımcı oluşturmaktadır. Araştırma verilerinin analizinde IBM SPSS 25 ve Lisrel 8.80 paket programı aracılığıyla açımlayıcı ve doğrulayıcı faktör analizleri uygulanmıştır. Açımlayıcı faktör analizi öncesinde verilerin faktör analizine uygunluğu KMO ve Barlett testleri ile analiz edilmiş ve KMO değeri 0,862 olarak belirlenmiştir. Ölçeğin yapı geçerliliğini ortaya koymak için açımlayıcı faktör analizi (exploratory factor analysis) yapılmıştır. Faktör analizi sonucunda 10 maddeden oluşan bir ölçek elde edilmiştir. Faktör analizinde maddeler toplam açıklanan varyansı %53,364 ve özdeğeri (eigenvalue) 1'den büyük olan tek faktör altında toplanmıştır. Doğrulayıcı faktör analizi (DFA) sonucunda; modelin uyum indekslerinden birisi olan χ2/sd'nin değeri 1,43 olarak saptanmıştır. Ayrıca uyum indekslerinin ölçeğin tek faktör yapısının iyi uyum gösterdiği belirlenmiştir. Ölçeğin Cronbach Alpha değerinin ,840 tespit edilmiştir. Sonuç olarak E-spora yönelik farkındalığın belirlenmesi için geliştirilen E-spor farkındalık ölçeğinin geçerli ve güvenilir bir ölçme aracı olduğu belirlenmiştir. Ölçek 10 madden oluşmaktadır.

Anahtar Kelimeler: E-Spor, Spor, Oyun, Dijital Oyun.

Introduction

The advancement of technology is facilitating a growing integration of individuals into technological systems. Today, the advancement of the technology industry has enabled individuals to reach a point where they can engage in gaming activities on the very same devices they utilize for their daily work. As a consequence of these developments, the concept of e-sports, which is defined by its recreational, social, and professional aspects, has emerged. Electronic sports are a type of sport that encompasses a broader range of physical and mental activities than traditional sports. They facilitate the interaction of individuals from diverse geographical locations, enabling them to engage in competitive gaming over the internet or with the involvement of large organizations. The evolution of e-sports has been shaped by the advancement of computer technology, with notable shifts occurring from the past to the present. The absence of measurement instruments for behavior, awareness, and perception in the literature on e-sports, which has a distinctive audience, is a notable gap. It is of interest to reveal the extent of the awareness, attitudes, and behaviors towards the e-sports system. It is hypothesized that the existing deficiencies in the literature can be addressed by determining the level of awareness towards e-sports with a measurement tool that is both valid and reliable.

Sports and e-sports concepts appear as two similar concepts. Sport is an educational and entertaining endeavor that is undertaken both individually and collectively, is governed by its own set of rules, is typically based on competition, and provides the opportunity for the development of both physical and mental abilities. Sport can be defined as a competitive, collective, and cultural phenomenon that facilitates the development of individual abilities in both natural and human environments. It is performed with or without tools and under specific rules, facilitating socialization, integration, and the development of both spirit and physique (Yazıcı, 2022).

The term "e-sports" is not universally accepted as a bona fide sport. Those who do recognize it as a sport define it as "a branch of sports in which technology is used in competitive computer games, played individually or as a team at amateur or professional levels in leagues and events, with rules specific to the game played, involving stakeholders such as game developers, individuals, teams, organizers, sponsors, and viewers" (Yükçü and Kaplanoğlu, 2018). Furthermore, the argument that e-sports constitute a sport is supported by the observation that e-athletes "carry out their work under stress and pressure within the framework of a professional training discipline in order to generate income" (Çınar, 2020). The ongoing advancement of technology is influencing sports in various ways, both directly and indirectly. The current popularity of video games has resulted in the emergence of a new sector. The concept of e-sports, also known as electronic sports, competitive or professional video gaming, emerges as a result of these developments (Üçüncüoğlu and Çakır, 2017). The field of e-sports, which has gained significant interest from both leisure and professional

perspectives, has generated substantial economic revenue with the advent of widespread internet usage and online video games since the 2000s. E-sports has gained considerable recognition on a global scale and has evolved into a distinctive field, boasting numerous sponsors, media revenue, national and international organizations, events, tournaments, and a multitude of e-sports federations (Halisdemir, 2021). In 2013, e-sports were incorporated into the "Federation of Developing Sports Branches". The "League of Legends Championship and Promotion League," the sole officially sanctioned e-sports league in Turkey as of 2017, has been operational since 2013. Players who compete in these leagues obtain official licensing from the Ministry of Youth and Sports (Üçüncüoğlu and Çakır, 2017). Despite the fact that many of these activities are conducted in a professional manner and in accordance with the established rules and regulations, they are not universally accepted as actual sports by all segments of society. While there are numerous studies on e-sports (Nazlı ve Yağmur, 2021; Mustafaoğlu, 2018; Zelyurt, 2021), there is a notable absence of studies that assess the awareness towards e-sports among the general public and athletes, and that examine the discrepancies between these groups. It is hypothesized that the scale developed within the scope of the present study will serve as a significant determinant of e-sports awareness. It is further hypothesized that the development of scales for measuring awareness of rapidly growing e-sports games and the accurate measurement of these features is of great importance. The present study aims to develop a valid and reliable measurement tool for determining the behaviors and awareness towards e-sports, which has a unique audience.

Materials and Methods

Study Model

Since the present study is a scale development study, it can be classified as basic research, and as the quantitative assessment of the data gathered from the participants was conducted in the study, it was carried out in accordance with the general survey model. The survey model is a study model that aims to describe a past or current situation as it exists and to define the individual, event, or object that is the subject of the study as it is within its own conditions (Karasar, 2008). The survey technique as was applied the data collection method, and data were collected online on a voluntary basis. The study was produced based on a master's thesis study numbered 818733.

Population and Sample

The study population consists of individuals residing in Istanbul who have engaged in, watched, broadcast, or otherwise demonstrated their involvement in electronic sports for a minimum of one year. The convenient sampling method was employed in the study. Convenient sampling is defined as a sample comprising a group of individuals who can be readily selected for study purposes

(Fraenkel and Wallen, 2006). In scale validity and reliability studies, it is recommended that the sample size be five times the number of items or observed variables recommended for the use of the factor analysis technique (Child, 2006). Kline (1994) asserts that although the item (variable) ratio should be kept at 10:1 for the sample size, this ratio can be reduced, but should be at least 2:1. In this context, the scale consists of 23 items. Accordingly, the sample size was calculated to be (n:179) based on the population parameters. Within the scope of the study, the principles specified in the Declaration of Helsinki were complied with and the study was approved by the Ethics Committee of İstanbul Gelisim University (Ethics Committee No. 2023-06-116).

Creation of the Scale Item Pool

In the process of forming the item pool, a comprehensive literature review on the subject of e-sports was conducted. This entailed a detailed evaluation of the existing studies on e-sports that have been published in academic literature, as well as the identification of any gaps or deficiencies in the related literature on e-sports awareness. Afterwards, a question pool consisting of 23 items was constructed. This involved identifying the segment and subject area in which awareness was to be gauged. The resulting questions were then categorized and submitted to three experts in the field. This was done by providing a detailed account of the intended measurement of the questions.

Expert Opinions and Content Validity

The item pool was presented to three experts in the subject area, who were informed about the subject of the study, in order to obtain expert opinions on the questions therein. The candidate scale was developed in accordance with the feedback provided by the experts. In order to obtain the opinions of the experts, a three-point rating scale was utilized. In the form prepared, the experts were expected to indicate their assessment of the item by selecting one of three options: "appropriate," "partially appropriate," or "not appropriate." All forms completed by the experts were then aggregated into a single data set. The items answered "not appropriate" by all three experts were excluded, while those answered "partially appropriate" were subjected to further evaluation. The items answered "appropriate" were retained. The remaining items were then submitted to the experts for further evaluation. In accordance with the opinions of the experts, the content validity of the items was determined using the content validity ratio developed by Veneziano and Hooper (1997). The ratios were determined by dividing the number of experts who responded positively for each item by the total number of experts minus one. The content validity indices of the items were determined based on the number of experts and the values of the content validity ratios obtained. Items with content validity ratios below 0.80 were excluded from further analysis. In total, ten questions from the question pool were evaluated as positive by the experts. The participants were requested to express

their awareness on a 5-point Likert-type scale, ranging from "Strongly Agree" to "Strongly Disagree," to the scale questions created in accordance with the content validity rate calculations obtained. Subsequently, the scale questions were submitted to a Turkish language expert for analysis in terms of spelling and grammar. The necessary corrections were made as suggested, and the scale was finalized.

Data Collection and Analysis

Questions were applied to the participants on the online platform and volunteer participants (n=179) were reached. The IBM SPSS 25 and Lisrel 8.80 software packages were selected for use in testing the validity and reliability of the E-sports awareness scale, which consists of 10 questions. The normality of the scale scores was evaluated through the examination of normal distribution curves, the calculation of skewness-kurtosis values, the visual representation of normal distribution curves through histograms, and the application of the Kolmogorov-Smirnov test, which is employed in cases where the group size exceeds 50. The results indicated that the data exhibited normal distribution. Exploratory and confirmatory factor analyses were conducted as the statistical analyses. The level of statistical significance was set at (Table 1; $p < 0.05$).

Ethics of Research

During the current research, we acted within the framework of the Higher Education Institutions Scientific Research and Publication Ethics Directive. In addition, the research process was approved by the ethics committee decision of Gelişim University Ethics Committee Chairmanship numbered 2023-06-116.

Table 1

Skewness and Kurtosis Values of The Item Scores and Significance Level Results of The Kolmogorov-Smirnov Test

	n	Skewness	Kurtosis	P
Item 1	179	-.071	-.356	.000
Item 2	179	.037	-.134	.000
Item 3	179	-.045	-.246	.000
Item 4	179	-.008	-.081	.000
Item 5	179	.003	.069	.000
Item 6	179	.001	.016	.000
Item 7	179	-.055	-.619	.000
Item 8	179	-.111	-.518	.000
Item 9	179	-.146	-.722	.000
Item 10	179	.135	-.604	.000

Upon examination of the results of the Kolmogorov-Smirnov test, it was found that the deviations from normality observed in the scale questions were at significant levels. It was determined that there were no excessive deviations in the normal distribution curves. Furthermore, when the

skewness and kurtosis coefficients were taken into consideration, all scores were found to be within the range of ±1.5. Büyüköztürk (2007) stated that skewness and kurtosis coefficients falling within the range of ±1 indicate normal distribution while Tabachnick and Fidell (2013) specified this range as ±1.5. The skewness and kurtosis values of the scores were found to fall within the range of ±1/±1.5, with no significant deviations from normality. Consequently, it was decided to apply Exploratory (EFA) and Confirmatory Factor Analyses (CFA) to the scale developed.

Results

Table 2

Item Correlation Analysis

Items		1	2	3	4	5	6	7	8	9	10
1	r	1									
	p	-									
2	r	,654**									
	p	,000									
3	r	,571**	,661**	1							
	p	,000	,000	-							
4	r	,584**	,507**	,558**	1						
	p	,000	,000	,000	-						
5	r	,519**	,532**	,454**	,559**	1					
	p	,000	,000	,000	,000	-					
6	r	,591**	,566**	,549**	,599**	,925**	1				
	p	,000	,000	,000	,000	,000	-				
7	r	,549**	,596**	,576**	,590**	,565**	,544**	1			
	p	,000	,000	,000	,000	,000	,000	-			
8	r	,667**	,538**	,558**	,543**	,597**	,516**	,543**	1		
	p	,000	,000	,000	,000	,000	,000	,000	-		
9	r	,505**	,555**	,581**	,560**	,630**	,678**	,505**	,656**	1	
	p	,000	,000	,000	,000	,000	,000	,000	,000	-	
10	r	,561**	,509**	,551**	,564**	,565**	,659**	,641**	,638**	,606**	1
	p	,000	,000	,001	,000	,000	,000	,000	,000	,000	-

Table 2 shows that the item-item correlation values ranged between 0.507 and 0.925. Each item within the factors was found to have a significant and positive relationship with the entire factor. It was determined that item discrimination was found to be good and very good. Given that the coefficients in the correlation matrix between the variables were greater than 0.05, the "direct oblimin" rotation method was selected and applied.

Table 3

KMO And Bartlett's Test Indicating the Adequacy of the Sample Size

KMO			,862
Bartlett's Testi		**X^2**	1016,89
		Sd	45
		P	,000

Table 3 shows that the KMO and Bartlett's test values were found to be greater than 0.05 in the Exploratory Factor Analysis (Kaiser-Meyer-Olkin Measure of Sampling Adequacy= ,862). Accordingly, it is assumed that the number of samples included in the study is adequate. The Bartlett's Test of Sphericity values indicated a statistically significant relationship between the items within the dimensions explained ($p < 0.05$). Accordingly, the Bartlett's Test of Sphericity values Table 4 were also deemed suitable for the implementation of the Exploratory Factor Analysis ($p < 0.05$). The load analysis explained the communalities of the items on the latent factors. In order to determine the latent factors, the eigenvalues values were accepted as higher than 1.

Table 4

Communalities of the Items on the Latent Factors

Items	Explanation Rate
I encourage people around me to engage in e-sports.	.527
E-sports and its branches should be as well-known as other sports branches.	.600
E-sports helps me to develop teamwork.	.584
I follow e-sports organizations with pleasure.	.550
I participate in e-sports voluntarily.	.516
I am aware of the positive and negative aspects of e-sports.	.586
I am aware of the opportunities that e-sports creates for me.	.641
I am familiar with the concepts and terms related to e-sports.	.585
I have sufficient knowledge about e-sports.	.692
E-sports organizations are compatible with the nature of sports.	.554

Extraction Method: Principal Component Analysis.
Rotation Method: Direct ObliminWith Kaiser Normalization.

Table 4 shows that the item pool subjected to factor analysis exhibited no instances where the factor load value fell below 0.30, thereby ensuring the emergence of independent factors. No item exhibited a factor loading value that differed by 0.10 or less across multiple factors. Thus, a scale comprising a total of 10 items was obtained. The loadings on the latent factor explaining the items in the table above were found to exceed 500. Given that the number of factors was determined to be one in the analysis, there is no overlap between factor loadings. Upon analyzing the items in terms of loading values, it was observed that the factor loadings of the scale ranged between 0.516 and 0.692, indicating a single-factor structure comprising 10 items.

Table 5

Total Explained Variance of Latent Factors

Factors	Eigenvalues			Rotation Sums of Square Loads		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	5,336	53,364	53,364	5,336	53,364	53,364

ExtractionMethod: Principal Component Analysis

The load analysis enabled the load of the items on the dimension (latent factor) to be determined, with the items themselves serving as the explanatory variable. In determining the latent

factor, the eigenvalues were accepted as higher than 1. Similarly, the factor loadings obtained during the factor analysis were examined using the principal component method. Upon analysis of the values, it was determined that a single factor exhibited an eigenvalue exceeding 1. Consequently, the number of factors within the scale was established as a single dimension. The single factor was found to account for 53.364% of the total variance. In order to determine the number of dimensions that the scale should possess, the scree plot graph was analyzed first. As a result, it was observed that there was a sharp drop from the first point to the second point on the scree plot graph, with the slope of the line becoming horizontal after the second point. Consequently, the number of points above the second point (or the number of intervals up to the second point) provides insight into the number of factors. Upon analysis of this graph, it can be concluded that the scale can be accepted as unidimensional.

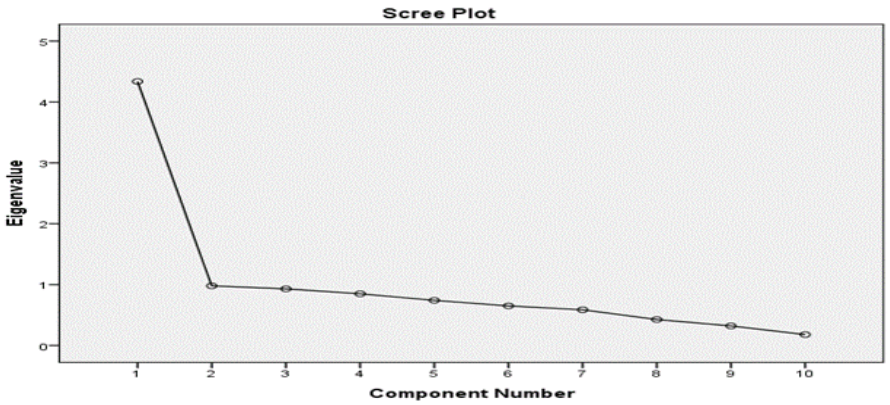

Figure 1. Line Graph of the Scale

According to the eigenvalue figure shown above, only one factor with eigenvalues higher than 1 is explained.

Table 6

Reliability Coefficients of the Scale Items

Scale	Item	Corrected Item Total Correlation	Cronbach's Alpha Coefficient when the item is removed
E-sports Scale	I encourage people around me to engage in e-sports.	.598	.811
	E-sports and its branches should be as well-known as other sports branches.	.663	.806
	E-sports helps me to develop teamwork.	.657	.806
	I follow e-sports organizations with pleasure.	.554	.815
	I participate in e-sports voluntarily.	.599	.811
	I am aware of the positive and negative aspects of e-sports.	.659	.806
	I am aware of the opportunities that e-sports creates for me.	.494	.827
	I am familiar with the concepts and terms related to e-sports.	.435	.828
	I have sufficient knowledge about e-sports.	.448	.824
	E-sports organizations are compatible with the nature of sports.	.313	.838
	Cronbach's Alpha Coefficient		.840

Table 6 shows that the Cronbach's Alpha Coefficient, which assesses the internal consistency of the items comprising the scale, was determined to be 0.840. The Cronbach's Alpha values obtained for the scale indicate that the overall scale is sufficiently reliable. The data provided by the participants to the relevant scale demonstrates an acceptable level of consistency.

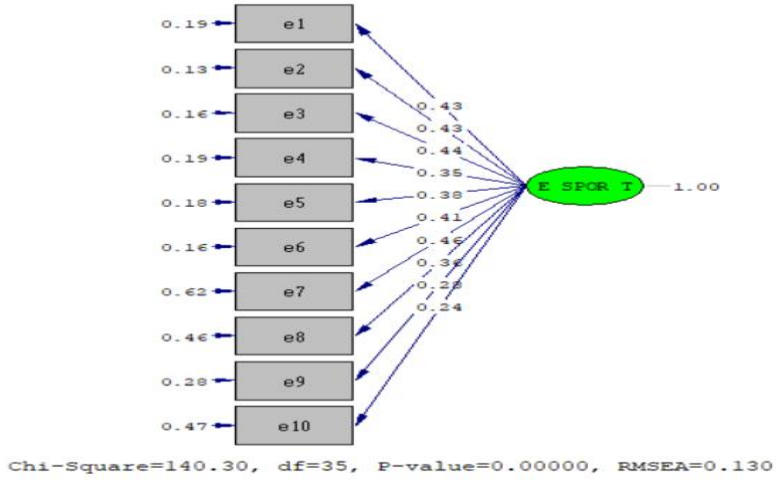

Figure 2. E-Sports Scale Path Diagram Significance Levels

The confirmatory factor analysis (CFA) was applied to test the single-factor structure of the scale. In this framework, the fit index obtained for the initial analysis is observed to be inadequate. At this phase of the analysis, it is useful to assess the proposed modifications. Upon examination of the suggested modifications, it is evident that the modifications between "e 5" and "e 6" will enhance the fit indices. One modification process was implemented.

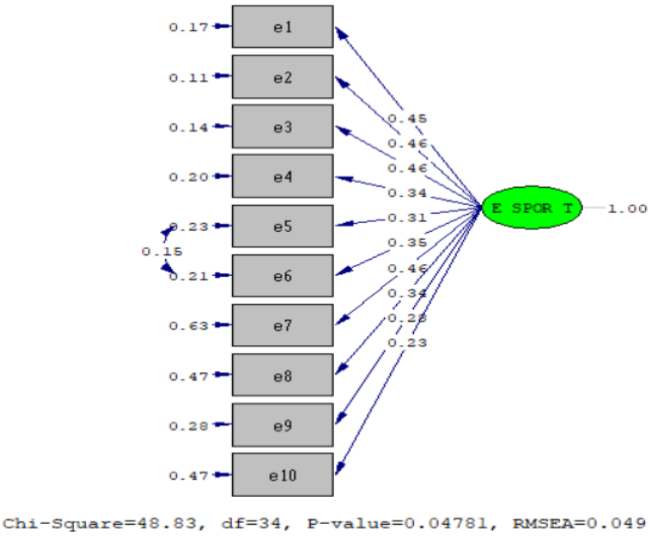

Figure 3. Path Diagram Obtained After Modification

Figure 3 shows that the modification process took place between "e 5" and "e 6." It was determined that the fit index obtained regarding the explanatory status of the latent variable in relation to the observed variables, indicated excellent fit.

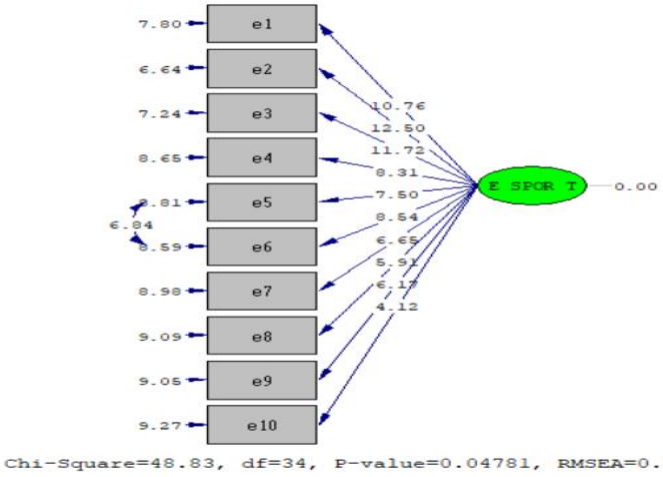

Figure 4. T Values Obtained After Modification

Figure 4 shows the t-values for the explanatory status of the latent variable with respect to the observed variables, as indicated by the arrows. The parameter estimates are deemed significant at the 0.05 level if the associated t-values exceed 1.96. "In structural equation modeling analyses, non-significant t values should be excluded from the analysis" (Çokluk, Şekercioğlu, & Büyüköztürk, 2012, p. 304). In this framework, an examination of the t-values in Figure 4 reveals that results between 4.12 and 12.50 are reached, with all items exhibiting significant t-values. The value of χ^2/sd, one of the fit indices of the model, was found to be 1.43 (p=,047). A ratio of the Chi-Square statistic to the degree of freedom (df) in a confirmatory factor analysis (CFA) is used to assess the fit of the model. A value of less than 3 indicates a perfect fit, while a value of less than 5 indicates a moderate fit (Kline, 2005; Sumer, 2000). Accordingly, it was determined that the χ^2/sd ratio exhibited an excellent fit for the analysis conducted. In the existing literature, numerous fit indices are employed to reveal the adequacy of the fit of the model tested in CFA. The most commonly utilized fit indices are the Chi-Square Goodness of Fit Index (GFI), the Adjusted Goodness of Fit Index (AGFI), the Comparative Fit Index (CFI), the Normed Fit Index (NFI), the Non-Normed Fit Index (NNFI), the Standardized Root Mean Square Residual (SRMR), and the Root Mean Square Error of Approximation (RMSEA). As the fit indices have both advantages and disadvantages in evaluating the fit between a theoretical model and real data, it is recommended that several fit index values be used to demonstrate the fit of the model.

Table 7

Fit Values For The Scale

Scale Values			
NFI	**NNFI**	**IFI**	**RFI**
0.96	0.98	0.99	0.95
CFI	**GFI**	**AGFI**	**RMR**
0.99	0.95	0.92	0.045
	X^2/df=1.43	**RMSEA**	
		0.049	

The NFI, NNFI, GFI, CFI, and AGFI fit indices yielded values of 0.96, 0.98, 0.95, 0.99, and 0.92, respectively. A RMSEA value of less than 0.05 indicates an excellent fit, while a value of less than 0.08 indicates a good fit (Çokluk, Şekercioğlu, Büyüköztürk, 2012). The results demonstrated that an excellent fit was achieved with an RMSEA value of 0.049. A ratio of the Chi-square statistic to the degree of freedom (df) below 3 in a confirmatory factor analysis (CFA) indicates an excellent fit, while a ratio below 5 corresponds to a moderate fit. Accordingly, the chi-square/sd ratio for the analysis conducted indicates that the model exhibits a perfect fit. Accordingly, it was determined that the 10-item and one-factor structure of the scale was validated as a model. When compared with the standard fit criteria to be considered as a result of confirmatory factor analysis, as stated by Schermelleh-Engel and Moosbrugger (2003), it is evident that the overall fit values fall within the "excellent fit values" group.

Discussion and Conclusion, Suggestions

In order to determine the validity and reliability of the e-sports awareness scale, exploratory and confirmatory factor analyses were conducted within the scope of the construct validity of the scale. Prior to conducting the exploratory factor analysis, the suitability of the data for factor analysis was evaluated through the application of the KMO and Barlett tests. The resulting KMO value was determined to be 0.862. A KMO value exceeding 0.90 is indicative of an excellent fit (Seçer, 2015; Özdamar, 2016). The results demonstrate that the value obtained in the study is at an optimal level. An exploratory factor analysis was conducted to ascertain the construct validity of the scale. In the factor analysis, the maximum direct oblimin method was selected to ensure that the structure of the relationship between the factors remained consistent. The factor analysis yielded a scale comprising 10 items. The items were grouped under a single factor in the factor analysis, with a total explained variance of 53.364% and an eigenvalue greater than 1. This finding aligns with the values determined in the literature (Çokluk, Şekercioğlu, & Büyüköztürk, 2012; Seçer, 2015; Tabachnick & Fidel, 2013). A confirmatory factor analysis (CFA) was conducted to determine the compatibility of the model with the data, with fit indices examined to this end. The analysis yielded a value of 1.43 for $\chi 2$/sd, one of the fit indices of the model. Moreover, the NFI value was 0.96, the NNFI value was

0.98, the IFI value was 0.99, the RFI value was 0.95, the CFI value was 0.99, the GFI value was 0.95, and the AGFI value was 0.92. This indicates that the one-factor structure of the scale demonstrated good fit as a result of confirmatory factor analysis. The RMSEA value of 0.049 indicates excellent fit. The Cronbach's alpha value for the scale was determined to be 0.840. The items comprising the scale are rated on a five-point Likert scale. The scale allows for a maximum score of 50 and a minimum score of 10. It is of great importance to develop scales for measuring awareness of rapidly growing e-sports games and to measure these features accurately. In the literature, studies have been conducted on behavior and awareness towards e-sports, which has a unique audience, and an awareness scale for e-sports has been developed.

In conclusion, it was established that the E-sports awareness scale, developed to assess awareness towards E-sports, is a valid and reliable measurement tool. The scale consists of 10 items. The maximum score that can be attained on the scale is 50, while the minimum score is 10. It is hypothesized that it is necessary to apply the scale developed for e-sports players to different sample groups to determine the social awareness towards e-sports. It would also be beneficial to test the validity and test-retest reliability of the scale by applying it to e-sports players in future studies.

Ethics Committee Permission Information

Ethics review board: İstanbul Gelişim University Ethics Committee

Date of ethical approval document: 11.08.2023

Issue number of the ethical approval document: 2023-6

Authors' contributions

Both authors contributed equally to all stages of the research.

Conflicts of interest

The author(s) have no declaration of conflict regarding the research.

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