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Development of Online Trolling Scale: Validity and Reliability Study

Çevrimiçi Trollük Ölçeğinin Geliştirilmesi: Geçerlilik ve Güvenilirlik Çalışması

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ABSTRACT

This study aims to develop a valid and reliable measurement tool to determine trolling in online environments. Two different study groups were used in the study. The study group for the exploratory factor analysis consisted of 493 university students (72.2% female; 27.8% male). The study group for confirmatory factor analysis consisted of 690 university students (71.7% female; 28.3% male). As a result of the exploratory factor analysis, it was seen that it consisted of 16 items and 3 sub-dimensions that explained 56.80% of the variance. The model obtained after the exploratory factor analysis was tested with confirmatory factor analysis and it was determined that the fit index values were within acceptable limits. The criterion validity of the scale was carried out with the Revised Cyberbullying Scale for University Students. Whereas the Cronbach alpha value for the entire scale was .89 for all of the scales, the same was found for sub-dimensions as .85, .73, and .66. As a result, it can be stated that the scale is a valid and reliable measurement tool.

Article Information

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ÖZET

Bu çalışmanın amacı çevrimiçi ortamlarda trollüğü belirlemeye yönelik geçerli ve güvenilir bir ölçme aracının geliştirilmesidir. Araştırmada iki farklı çalışma grubu kullanılmıştır. Açımlayıcı faktör analizi için çalışma grubunu 493 üniversite öğrencisi (%72.2 kadın; %27.8 erkek) oluşturmaktadır. Doğrulayıcı faktör analizi için çalışma grubunu ise 690 üniversite öğrencisi (%71.7 kadın; %28.3 erkek) oluşturmaktadır. Gerçekleştirilen açımlayıcı faktör analizi sonucunda varyansın %56.80'ini açıklayan 16 madde ve 3 alt boyuttan oluştuğu görülmüştür. Açımlayıcı faktör analizi sonrasında elde edilen model doğrulayıcı faktör analizi ile test edilmiş ve uyum indeks değerlerinin kabul edilebilir sınırlar içerisinde olduğu belirlenmiştir. Ölçeğin, ölçüt geçerliği ise Üniversite Öğrencileri İçin Yenilenmiş Siber Zorbalık Ölçeği ile gerçekleştirilmiştir. Ölçeğin tamamı için cronbach alfa değeri .89 iken alt boyutları için .85, .73 ve .66 olarak bulunmuştur. Sonuç olarak ölçeğin geçerli ve güvenilir bir ölçme aracı olduğu ifade edilebilir.

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INTRODUCTION

The increasing use of the internet and social media has brought many problems such as cyber violence, cyberbullying, and cyber obsessive stalking. Today, trolling behaviors have been added to these negativities. It can be said that almost every user who uses the internet and social media is exposed to troll behaviors. For this reason, it is seen that the concept of trolling has been discussed by different disciplines in Turkey and in the international literature in recent years. The word troll comes from the hunting of fish by dragging a bait line behind the boat (Herring et al., 2002). Based on this explanation, the word troll in the internet and social media environment is expressed as entrapment in order to anger, manipulate, hurt and mock people (Griffiths, 2014). Trolling is explained as the behavior of the individual in online environments that will cause other people to experience feelings such as anxiety, distress, and fear. In addition, trolling is also expressed as the transfer of anti-social behavior to the online environment (Sanfilippo et al., 2017). In this research, trolling is considered as engaging in aggressive and provocative behavior towards other people for the purpose of having fun or harming.

The possibility of easy communication with other people and concealment of identity provided by the Internet and social media facilitates trolling behaviors (Moor & Anderson, 2019). These facilities also facilitate cyberbullying. Although cyberbullying and trolling behaviors are similar concepts in online environments, the important difference between them can be shown that there is provocation in trolling where aggression is dominant in bullying (Moor & Anderson, 2019). For example, while trolling behaviors may be offensive behaviors such as making insulting shares and comments, disclosing the private information of the individual, it can also include provocative behaviors such as spreading gossip, making sarcastic comments and spreading fake news. However, regardless of the type of trolling, prevention of trolling is extremely important for the psychological health of society, as it can lead to psychologically negative consequences for the individuals who are exposed to it.

Trolling behavior in online environments can start from many motivational sources. (Navarro-Carrillo et al., 2021). Buckels et al. (2019) trolling behavior can be done for entertainment purposes or it can be done with the aim of harming other people. They stated that trolls have a tendency to harm other people, similar to the sadism personality trait, and they are motivated by sadism personality traits. Shachaf & Hara (2010) In their research with Wikipedia trolls, tried to find the motivation sources of the trolls. In their studies, they stated that trolls have motivational sources such as drawing attention and success, desire to harm people and society, prestige, gaining power, entertainment, and boredom. However, the motivations of trolling behaviors can also be considered in terms of internal and external factors. While the emotional and cognitive state of the individual can be explained as internal factors; the effect of the social environment is explained as external factors. In addition, trolling behaviors also have motivational sources such as loneliness, harm-based intent, provocation, confusion, humor, and curiosity (Fichman & Sanfilippo, 2015). As a result, it can be said that trolling behavior has many sources of motivation, but these sources of motivation can be gathered under the headings of harming, provoking, and hiding their identity.

With the increase in the prevalence of troll behaviors, it is seen that the researches on this subject also increase. For example, when the studies on trolling are examined, it was found to have a positive relationship with psychopathy and sadism and a negative correlation with social skills (Sest & March, 2017). Masui (2019) In his study, he concluded that the increase in the loneliness level of the individual may also increase the trolling behaviors. In another study, internet trolling behaviors were found to be

positively related to psychological variables such as sadism and negative social potential. In addition, in a study conducted with university students, it was found that trolling behaviors and compatibility personality traits were negatively related (Seigfried-Spellar & Lankford, 2018). Studies show that trolling behavior in online environments and exposure to trolling behaviors are related to many psychological variables.

It is known that the rate of internet and social media usage among young people is high (Pew Research Center, 2019a; Pew Research Center, 2019b). On the other hand, it is seen that violent behaviors are common among young people in online environments (Kokkinos & Antoniadou, 2019). It can be said that one of the most common online behaviors among young people is trolling. Considering both the prevalence of trolling and the psychological effects it may have on the subject and the object of the behavior, it can be said that there are few studies on this topic. The reason for this situation can be shown as the lack of a sufficient number of measurement tools in this regard. In our country, there are measurement tools adapted and developed to determine trolling behaviors. For example, the scale developed by Kızıltepe (2019) to measure online troll behaviors consists of 22 items and one dimension. On the other hand, Manuoğlu (2020) developed the Sarcastic Trolling Scale. It consists of one dimension and eight items. The scale measures the sarcastic trolling behaviors of participants in online environments. Manuoglu (2020) also conducted a Turkish adaptation of the Cyberbully/Troll Deviancy Scale. The Cyberbully/Troll Deviancy Scale consists of 13 items and one dimension. The scale measures the frequency of trolling behavior in each item. This scale was developed by Zezulka & Seigfried-Spellar (2016). However, it has been stated in the literature that individuals who engage in trolling behaviors have different motivational sources and therefore they engage in trolling behaviors in different ways. However, it is seen that the data collection tools developed and adapted to determine trolling behaviors in our country consider trolling from a single dimension. Therefore, it is necessary to determine the trolling behaviors that occur in different ways through different motivational sources. Therefore, this research aims to develop the Online Trolling Scale.

METHOD

In this part of the research, there is information about the study group, the data collection tool, and the analysis of the data.

Study Group

Exploratory factor analysis (EFA) was conducted on a total of 493 university students (72.2% female; 27.8% male). The age of the study group for EFA ranged from 18 to 30 (X = 21.17). Confirmatory factor analysis (CFA) was conducted on a total of 690 university students (71.7% female; 28.3% male). The age of the study group for CFA ranged from 18 to 29 (X = 21.92).

Ethical Statement

An informed consent form was prepared for the students who participated in the scale development phase, explaining the general purpose of the study, that the participation was voluntary, and that the researchers' contact addresses were prepared and it was given to the students during the application. In addition, ethical permission for this study was obtained from the Scientific Research and Publication Ethics Committee of Karamanoğlu Mehmetbey University, dated 11.03.2021 and numbered E-95728670-020-10067.

Data Collection

In the development process of the scale, first of all, an informed consent form was presented to participants which covered the contact information of the researchers, the purpose of the research, and that the participation was on a voluntary basis, and data were collected from the students who voluntarily agreed to participate in the research. The data in the research were collected online.

Data Collection Tools

Personal Information Form. This form aims to determine the age and gender of the participants.

Revised Cyberbullying Scale for University Students. The scale was developed by Tanrıkulu and Erdur-Baker (2020) to measure the cyberbullying experiences of university students. The scale consists of two parts with the same 11 items. The scale is a 4-point Likert (0 = none, 3 = more than three). While the frequency of cyberbullying is measured in the first part, the frequency of being exposed to cyberbullying is measured in the second part. In this study, the cyberbullying part of the scale was used. Cronbach alpha internal consistency coefficient of the cyberbullying part of the scale was obtained as .81.

Process

The scale development process started with a literature review. During the literature review, measurement tools developed to detect trolls in online environments were examined. After the literature review, a 30-item draft form was created. Then, this form was evaluated in terms of content validity by a total of seven experts, five in the field of psychological counseling and guidance, one in the field of measurement and evaluation, and one in the field of Turkish Education. In line with the feedback from the experts, 11 items were removed from the scale and three items were rearranged. The form obtained after the feedback from the experts was applied to a group of 85 university students. In this application, university students were asked to indicate the items that were not understood. At this stage, an item that was difficult to understand was corrected. After this process, a 19-item draft form was created and validity and reliability studies of the scale were carried out on these items. After this stage, after obtaining the necessary ethics committee permission, the scale was applied to university students with the personal information form. It was observed that the participants completed the form in approximately 7 minutes. After the EFA, it was seen that the scale consisted of 16 items and 3 sub-dimensions. Then CFA was performed. CFA validated the model obtained as a result of EFA. In addition, the criterion validity and reliability of the scale were also investigated.

Data Analysis

The construct validity of the Online Trolling Scale was examined by EFA and CFA. First, EFA and then CFA were performed. Before performing the EFA, the Kaiser-Meyer-Olkin coefficient and the Barlett Sphericity Test were performed to determine whether the data were suitable for EFA. As a result of the analyzes carried out, it was seen that the data were suitable for EFA. Principal component analysis was performed in EFA. The structure obtained by EFA was tested with CFA. As a result of DFA, model compliance was checked with x2 /sd, GFI, CFI, NFI, RFI, AGFI, IFI, RMSEA fit indices.

The reliability of the Online Trolling Scale was tried to be determined by the Cronbach alpha internal consistency coefficient and corrected item-total correlations. SPSS 22 and AMOS 22 programs were used for the validity and reliability analyzes of the scale during the development process.

RESULTS

Results Regarding Explanatory Factor Analysis

EFA was conducted to determine the construct validity of the Online Trolling Scale. Kaiser Mayer Olkin (KMO) value and Barlett sphericity tests were performed to determine the sample size of the data obtained before the EFA and its suitability for factor analysis. Whereas following the tests realized the KMO value was determined as .92, the Barlett test $\chi 2$ was found as 3819.358 ($p<.01$). KMO and Barlett test results are given in Table 1. The fact that the KMO value is between minimum .80-90 and the significance value for the x2 value according to the results of Barlett Globality test results being less than .05 was evaluated as the data were suitable for EFA (Cokluk et al., 2014).

Table 1. KMO and Bartlett's test value

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		.921
Bartlett's Test of Sphericity	Approx. Chi-Square	3819.358
	Degree of freedom	171
	p	.000

Whereas the KMO value as a result of the KMO and Barlett test performed for the factor analysis after the items were removed was obtained as .90, Barlett Barlett test $\chi 2$ value was obtained as 2773.580 ($p<.01$). Information on the KMO and Barlett test results are demonstrated in Table 2.

Table 2. KMO and Barlett's test value

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.903
Bartlett's Test of Sphericity	Approx. Chi-Square	2773,580
	Degree of freedom	120
	p	.000

After the data set obtained to develop the Online Trolling Scale was found to be suitable for EFA, analyzes were continued in order to determine the factor structure of the scale. In the EFA, which was first performed without factor limiting, a three-factor structure with an eigenvalue above one, which explains 56.803% of the total variance, emerged. Varimax, one of the vertical rotation techniques, was used in EFA. As a result of the rotation process, it was determined that there were items under more than one factor, and the difference between these items was under 10. Items with a factor load lower than 30 and the difference between the load value taken in both factors being under .10 were removed from the dataset. The overlapping items were removed from the scale and the analysis was repeated. The rotation process was repeated after each item was removed. As a result of the rotation process, a three-factor, 16-item scale structure with an eigenvalue greater than 1 was obtained. The scree plot obtained after rotation in EFA is given in Figure 1. In addition, information on the total variance explained after the rotation is given in Table 3.

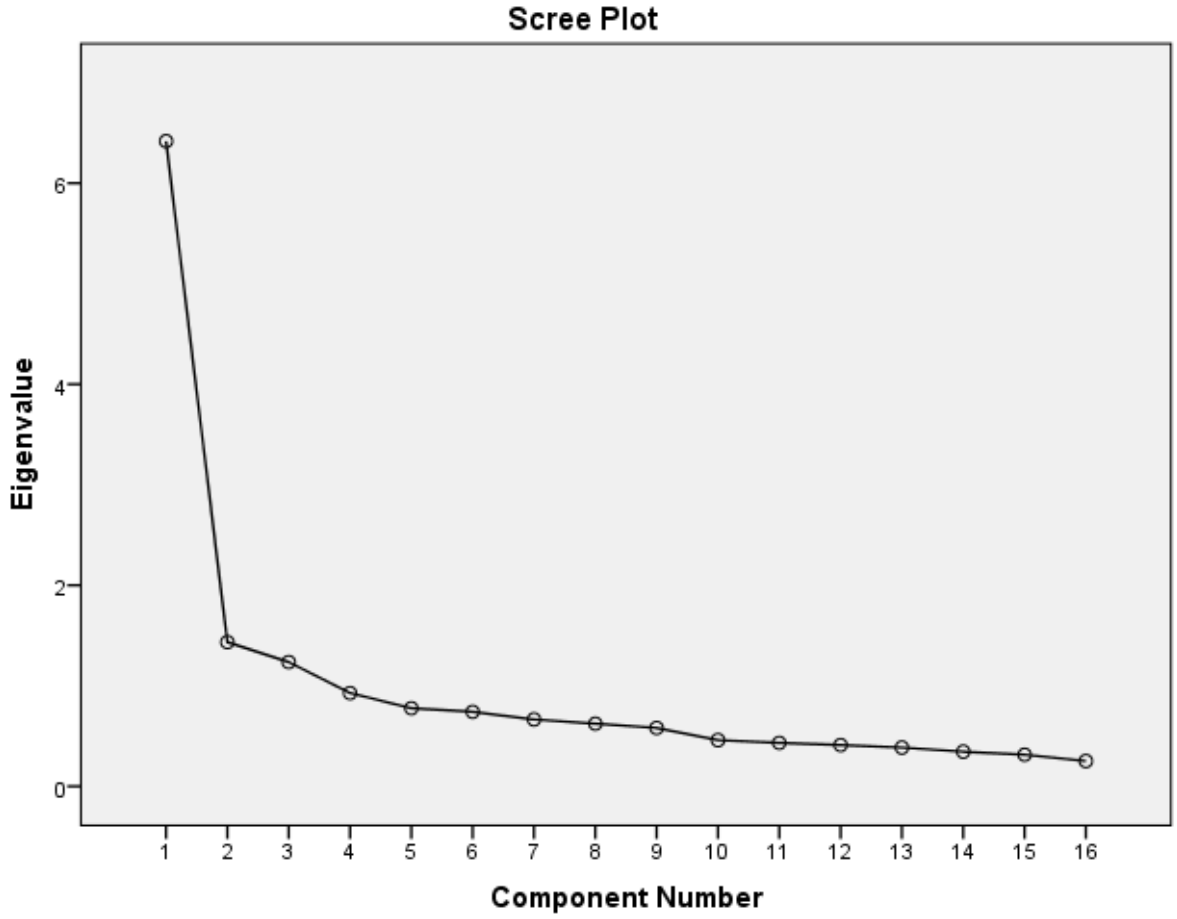

Figure 1. The scree plot obtained after rotation for the scale items

Table 3. Total Amounts of Variance Explained

Factors	Initial Eigenvalues			Total Factor Loads			Rotated Sums of Factor Loads		
	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %	Total	Variance %	Cumulative %
1	6.418	40.115	40.115	6.418	40.115	40.115	4.621	28.879	28.879
2	1.434	8.965	49.080	1.434	8.965	49.080	2.396	14.974	43.853
3	1.236	7.723	56.803	1.236	7.723	56.803	2.072	12.950	56.803
….	….	…..	….						
16	251	1.570	100.00						

When Figure 1 is examined, it is seen that the scree plot has oblique breaks at 3 points. When Table 3 is examined, it is seen that a three-factor structure that explains 56.803% of the total variance emerged after the related items were removed. It can be said that this situation shows that the information in the total variance tables explained after the rotation of the scree plot and the scale items overlap with each other. Considering the variances explained by the factors, it was found that the first factor explained 28.879%; and that the second factor explained 14.974%, and finally, the third factor explained 12.950%.

Table 4. Total Variance Table of Scale Items Explained After Rotation

Items	Factors		
	Factor 1	Factor 2	Factor 3
m13	.78		
m11	.74		
m15	.71		
m9	.71		
m16	.69		
m19	.68		
m12	.68		
m18	.66		
m17	.50		
m5		.83	
m6		.74	
m3		.65	
m4		.60	
m8			.81
m1			.72
m7			.68

As seen in Table 4, factor loads of 9 items in the first factor of the scale were .50 to .78. The factor loads of the four items in the second factor were between .60 and .83. Finally, the factor loads of the 3 items in the third factor of the scale change between68and 81. When Table 4 is examined, it is seen that the items in the scale have acceptable factor load values and none of the items have overlapping features.

Table 5. Sub-Dimensions and Items Formed After EFA

Factor	Number of Items	Item Numbers
Factor 1	9	m13-m11-m15-m9-m16-m19-m12-m18-m17
Factor 2	4	m5-m6-m3-m4
Factor 3	3	m8-m1-m7

The first factor is called "harm-based Trolling". The items in the first factor are "It happens that my comments or posts I make for fun disturb/upset other people." and "I sometimes skew people's posts.".

The second factor is called "Provocation Based Trolling". The items in the second factor are "I make posts that will anger a certain person or group." and "I make posts targeting people who have different opinions with me.".

The third factor was named "Fraud-Based Trolling". The items in the third factor are "I sometimes make fun of other people by using fake accounts." and "When people block me, I try to reach them with a fake account.".

Confirmatory Factor Analysis for the Validity of the Online Trolling Scale

As a result of the EFA conducted for the online trolling scale, a three-factor structure was obtained. The validity of the three-factor structure was tested with CFA through data obtained from a different study group consisting of 690 university students. The fit values obtained as a result of CFA are as follows: x2/sd= 4.17; GFI= .94; NFI=.91; CFI = .93; RFI = .90; AGFI = .91; IFI = .93; TLI = .92; RMSEA = .064. The fit index values of the scale are given in Table 6. In addition, acceptable and perfect fit values (Çelik & Yılmaz, 2013; Çokluk, Şekercioğlu & Büyüköztürk, 2018; Karagöz, 2016; Tabachnick & Fidell, 2015) are also indicated in Table 6.

Table 6. Fit Indexes Obtained from CFA and Fit Index Criteria

Fit Indexes	Values Obtained After CFA	Acceptable Fit	Perfect Fit
x^2/df	4.17	≤ 5	≤ 3
GFI	.94	≥ .85	≥ .90
NFI	.91	≥ .90	≥ .95
CFI	.93	≥ .90	≥ .95
RFI	.90	≥ .90	≥ .95
AGFI	.94	≥ .85	≥ .90
IFI	.93	≥ .90	≥ .95
TLI	.92	≥ .90	≥ .95
RMSEA	.064	≤ .08	≤ .05

As can be understood from Table 6, the scale has acceptable and perfect fit index values. Figure 2 includes the path diagram that emerged after the CFA was performed.

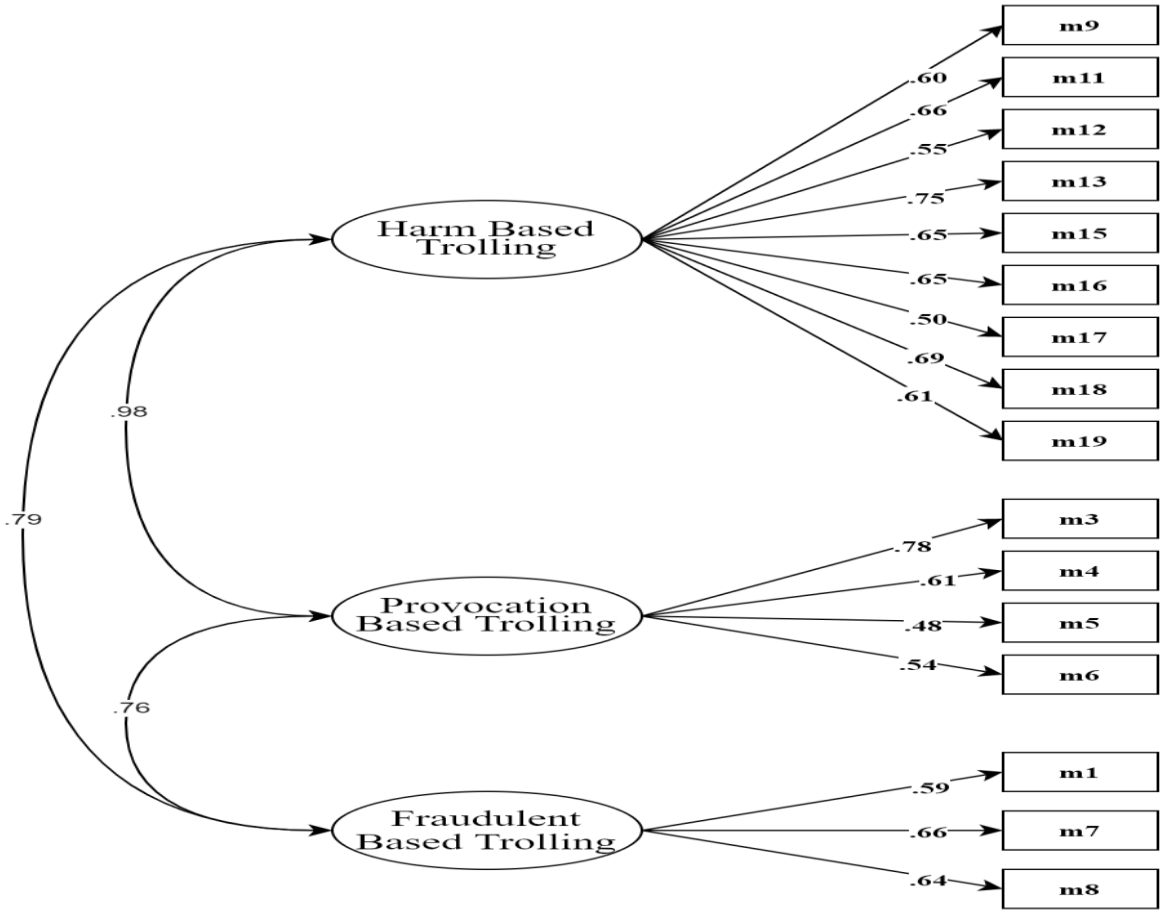

Figure2. CFA Path Diagram

As a result, when Table 6 and Figure 2 are examined, it is seen that the structure obtained as a result of EFA was confirmed by CFA.

In this study, the Renewed Cyberbullying Scale for University Students, developed by Tanrıkulu and Erdur-Baker (2020), was used to determine the criterion validity of the scale of trolling in online environments. Correlation coefficients between the two scales were calculated in order to examine the criterion-related validity of the online trolling scale. The correlation coefficients between the sub-dimensions and total score of the OTS and the total score of the cyberbullying scale were respectively,

positively and significantly .40, .31, .24 and .43. The results obtained regarding the criterion validity of the OTS are given in Table 7.

Table 7. Results on Criterion Validity

Scales	Cyberbullying
Harm-Based Trolling	.40*
Provocation-Based Trolling	.31*
Fraudulent Based Trolling	.24*
Total Score	.43*

p<.05

Cronbach's alpha internal consistency coefficient was examined to determine the reliability of the OTS. As a result of the analysis, the internal consistency coefficient of the scale was determined respectively as .85, .73, .66, and for the entire scale as .89. The results regarding the reliability are given in Table 8.

Table 8. Reliability Analysis for the Sub-Dimensions and the Whole of OTS

Online Trolling Scale	Cronbach Alpha Internal Consistency Coefficient
Harm-based Trolling	.85*
Provocation-Based Trolling	.73*
Fraudulent Based Trolling	.66*
Total Score	.89*

Pearson Product Moment Correlation analysis was performed to determine whether there is a significant relationship between the sub-dimensions of the scale. Analysis results are given in Table 9.

Table 9. Correlation values between the sub-dimensions of the scale

Sub Dimensions	Harm-based Trolling	Provocation-Based Trolling	Fraudulent Based Trolling
Harm-based Trolling	1.00		
Provocation-Based Trolling	.31**	1.00	
Fraudulent Based Trolling	.39**	.67**	1.00

When Table 9 is examined, it could be seen that there is a relation between harm-based Trolling and Provocation Based Trolling sub-dimensions at a significance level of (r=31; p<.001); between harm-based Trolling and Fraudulent Trolling sub-dimensions at a significance level of (r = .39; p<.001) and between the Provocation-Based Trolling and Fraud-Based Trolling sub-dimensions at a significance level of (r = .67, p < .001). These results can be shown as proof that the sub-dimensions of the OTS are in the same structure.

Table 10. Findings Regarding Item Reliabilities

Sub Dimensions	Item No	When the item is removed			Adjusted item-total correlation
		Scale average	Scale variance	scale alpha	
Harm-Based Trolling	M9	19.2679	42.920	,885	,568
	M11	19.3407	43.652	,885	,617
	M12	19.1196	41.626	,885	,544
	M13	19.3355	43.148	,883	,666
	M15	19.2094	42.421	,884	,597
	M16	19.2627	42.525	,884	,599

	M17	19.0962	41.946	,889	,470
	M18	19.1808	41.778	,882	,629
	M19	19.1664	42.254	,884	,583
Provocation-Based Trolling	M3	19.3004	42.885	,882	,686
	M4	19.2003	42.124	,884	,579
	M5	18.9558	41.206	,890	,480
	M6	19.0715	41.741	,886	,537
Fraudulent Based Trolling	M1	19.1651	42.505	,887	,496
	M7	19.0780	41.653	,886	,525
	M8	19.0767	41.748	.887	.507

When Table 9 is examined, it could be seen that the adjusted article total correlations of the scale change for harm-based trolling sub-dimensions from .47 to .67; for provocation-based trolling sub-dimensions from .48 to 69 and for fraudulent based trolling sub-dimension from .50 to .53. The fact that the adjusted item-total correlations are over .30 is an indication that the items are distinctive (Büyüköztürk, 2020). Therefore, it can be said that the corrected item-total correlations obtained for the sub-dimensions of the scale are sufficient.

DISCUSSION

In this study, the Online Trolling Scale was developed. The construct validity of the scale was determined by EFA. As a result of the EFA performed, a three-factor structure was obtained, which explained 56.803% of the total variance of the OTS. It can be said that this explained variance rate is at a sufficient level among multi-factor structures (Büyüköztürk, 2020). The structure obtained as a result of EFA was tested with CFA. After the CFA, the model was found to have acceptable and excellent fit index values. The reliability of the OTS was evaluated with the Cronbach's alpha internal consistency coefficient and the corrected item-total correlation. It can be said that the entire scale, its sub-dimensions, and items are within acceptable limits for reliability (Büyüköztürk, 2020). As a result of the validity and reliability analyzes carried out, it was seen that the scale had sufficient validity and reliability.

Today, applications in online environments have become an indispensable part of our lives. This situation has brought many negativities such as smartphone addiction, cyberbullying, internet addiction, intense social media use, and digital game addiction (Bakioğlu, 2020; Peker, 2019; Savcı & Aysan, 2017; Savcı et al., 2020; Savcı et al., 2021; Traş et al., 2019). Internet and social media use is common among university students. However, university students face many problems due to their developmental period (Özteke Kozan & Hamarta, 2017). Therefore, it can be stated that university students are in the risk group against online problems. Trolling is one of these negativities. Trolling can be explained as behaviors that every individual using the internet and social media can be exposed to and sometimes not aware of even though they are exposed. Trolling can lead to many negative psychological outcomes for the exposed. In order to prevent these negative psychological outcomes, preventive studies are required. For this, it is necessary to be able to determine what is trolling and to determine the characteristics of the individuals who indulge in trolling. At this point, we think that the scale we have developed will provide convenience to researchers in the field of psychological counseling and guidance. Considering that trolling is not only an individual feature, we think that this scale can be used in many fields such as psychology, sociology, law, and education.

When the scales developed for trolling are examined, it is seen that trolling is generally tried to be measured with one dimension (Craker & March, 2016; Buckels et al., 2014; Manuoğlu, 2020;

Kızıltepe,2019). Hong and Cheng (2018), on the other hand, discussed trolling with different dimensions with the scale they developed. The scale they developed in their work consists of four dimensions: harm-based trolling, obstruction trolling, evocative trolling, and pathological trolling. Trolling has many sources of motivation and the way of occurrence. Examples of these are harming, provoking, concealing oneself, upsetting the other person, making fun of others, taking revenge, entertainment, showing up in social environments (Bentley & Cowan, 2021; Navarro-Carrillo et al., 2021; Sun & Shen, 2021; Thacker). & Griffiths, 2012). While troll behavior can manifest in different ways, the underlying behavior may be harmful. For example, trolling can be done for fun, but this can harm the other person. In addition, a trolling behavior made for entertainment purposes may provoke the other person. The most striking point in all trolling behaviors is the opportunity to remain anonymous in the online environment (Hannan, 2018). In order to better explain the trolling behaviors, measurement tools should be developed to determine the different dimensions of trolling. In this study, it was seen that the motivation and trolling behaviors given above were grouped under three factors.

We think that with this developed scale, we have gained a different perspective on the negative use of the internet and social media in Turkey. We think that this scale can be a forerunner for future studies on trolling. We think that the scale will also be used in studies to be carried out on the negative use of the internet and social media due to its economic feature. However, the scale has some limitations as well as its strong features. First of all, it can be said that the most basic limitation of the scale is that it is a self-report type scale. For various reasons, participants may not answer sincerely during data collection in self-report measurement tools. In addition, data for this scale were collected from university students. Considering that trolling behavior can be carried out by almost everyone who can use the internet and social media, the validity and reliability of the scale should be examined in different age groups. Finally, a convenience sampling method was used in this study. This is among the limitations of the study. Therefore, it can be said that the validity and reliability study of the scale can be carried out by using random sampling methods.

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Conflict of Interest

It has been reported by the authors that there is no conflict of interest.

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This study was completed in accordance with the Helsinki Declaration. In line with this, the study was permitted by Karamanoğlu Mehmetbey University, Human Research Ethics Committee.
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