IJSER
ISSN: 2149-5939

International Journal of Social Sciences and Education Research
Online, https://dergipark.org.tr/tr/pub/ijsser
Volume: 10(3), 2024

Development and initial validation of the online risk-taking scale

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Article Info

Research Article

Received: 26 August 2024
Revised: 24 September 2024
Accepted: 25 September 2024

Keywords:
Online risk-taking,
Validity,
Reliability,
Scale

Abstract

This study aims to develop and validate the Online Risk-Taking Scale. Based on the results of expert opinions and a trial application, a 20-item draft form was created. This scale includes 20 questions about behaviors that are considered risky and have been performed in the last six months. The scale was administered to 214 secondary school students as an online questionnaire, and data were collected. Validity and reliability studies were conducted using these final data. Exploratory factor analysis and confirmatory factor analysis were performed to determine the validity levels of the scale. Cronbach's α coefficient and McDonald's Omega (ω) coefficient were analyzed to assess the reliability levels. The scale demonstrated satisfactory validity and reliability. As a result, a valid and reliable measurement tool that will contribute to the literature by determining the online risk-taking levels of secondary school students has been obtained.

1. Introduction

Internet technology was created in 1969 in the USA to coordinate the military communication system. Since then, the modern Internet system we use today has become integral to our lives. All computer systems using the Internet represent the digital world, and children of our age are born into this digital world and grow up within its conditions. Technology has brought positive changes to human life. Thanks to technology, tasks can be completed faster and more efficiently. Technological developments facilitate connections with countries worldwide, and working conditions can be created quickly and efficiently. The internet has become an integral part of many individuals' lives. However, alongside the positive benefits of technology, its negative effects on health and other areas have become a concern. Countries may face costs related to health problems and technical difficulties.

Adolescents spend more time with technological devices such as computers, smartphones, and tablets than adults. In the USA, 91% of adolescents use the Internet daily (Gross, 2004). According to the data from the Turkish Statistical Institute (TÜİK) Information Technologies Usage Survey on Children in 2021, the daily internet usage rate of children between the ages of 6 and 15 is reported to be 90.1%. Additionally, 64.4% of children use smartphones or mobile phones, 55.6% use desktop or laptop computers and tablets, and 35.9% spend time in front of screens. The purposes of using the internet include attending online classes, using the Internet for learning purposes or homework, playing and downloading games, making audio and video calls over the internet, watching videos on sharing sites, and messaging (TÜİK, 2021). These usage figures reveal that the internet is a significant part of children's and young people's lives. These devices make life easier. However, their uncontrolled use causes many problems (Mustafaoğlu et al., 2018). In addition to being used as a means of communication, technological devices are utilized for various purposes such as education, transportation, health, and entertainment. As these devices have become an integral part of life in recent years, their use among children, young people, and adults is increasing uncontrollably (Joshi & Rose, 2018).

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To cite this article: Şengün Afşin, R., Doğan, Ö. & Öğretir Özçelik, A. D. (2024). Development and initial validation of the online risk-taking scale. *International Journal of Social Sciences and Education Research*, 10 (3), xx-xx. DOI: https://doi.org/10.24289/ijsser.1538888

ISSN: 2149-5939

Studies investigating the negative and positive effects of digital use on children and adults can be found in the literature. According to the US Bureau of Labor Statistics, applications related to diseases caused by computer use constitute 64% of work-related diseases. Long-term computer use causes significant damage to the eyes, social development problems, musculoskeletal system, and emotional eating disorders. (İnandı & Akyol, 2001; Mustafaoğlu et al., 2018). Uncontrolled and excessive internet use during adolescence negatively affects psychological, social-emotional, cognitive, and physical development (Evgin et al., 2019). Excessive internet use causes functional impairment in the brain's prefrontal cortex, making it difficult for adolescents to control their movements and impairing their planning and motivation skills. More importantly, it may cause psychosocial dangers, such as exhibiting more risky behaviors and engaging in dangerous activities (Mridha, 2019). Increased internet use is known to cause negative behaviors such as depression, dissatisfaction with life, aggression, a decrease in positive social behaviors, and desensitization to violence (Andreassen et al., 2016; Bargeron & Hormes, 2017).

The increase in the frequency of use of technological devices has also brought problems related to the access of individuals who abuse technology to children through these devices. Technological devices can harm children's social, emotional, and physical development with content such as online child abuse, exposure to harmful content, sharing private information with strangers, and cyberbullying (Çalışkan, 2019; Karaman & Ayhan, 2021). This brings up the issue of creating some limitations on using technological devices by parents and educators and informing children about these risks.

It is undeniable that internet use has many benefits for children, both socially and educationally. However, many studies have shown that children are exposed to and exhibit risky behaviors online. Livingstone and Helsper (2007) explain that children, in particular, are exposed to commercial, violent, sexualized, or cyberbullying incidents or harassment in online environments. Livingstone and Bober (2014) stated that more than 30% of children between the ages of 9 and 19 were exposed to sexual harassment and bullying behaviors via email or messaging. Almost half of the participants in the study stated that they shared their personal information with people they did not know online, made friends with people they did not know, and met face-to-face with people they met online, engaging in behaviors that can be considered risky. Another study showed that children who went on a date assuming that the person they met online was a teenager learned that the person they communicated with was an adult (Liu et al., 2005). This shows that people in the online environment may also be malicious.

In a bulletin prepared by the OECD (2021), online risk types are defined in four categories: content risks, behavioral risks, contract risks, and contact risks. Many of these are digital versions of traditional risks. It can be said that every type of risk encountered in real life also exists online. For example, bullying, racism, sexism, and sexual harassment exist both in real-life and online environments. Just like in daily life, reaching environments with zero risk in online spaces is impossible. However, creating the conditions for a safer online environment is possible. Livingstone and Haddon (2009) defined the risks that children face in online environments in four categories: risks related to cultural values, commercial risks, sexual risks, and violent risks.

In their study, Ybarra et al. (2007) identified nine risky online behaviors in young people. These behaviors include publishing personal information, sending personal information, making rude comments to others, embarrassing and harassing others, meeting someone online, having people they do not know in their friend list, visiting porn sites, talking about sex with online people, and downloading files on file-sharing sites. The EU Kids Online network has categorized online risks to children as violent, sexual, value-related, and commercial (Livingstone & Smith, 2017). Especially after the increase in usage, the internet and technological devices have become more private for children and less accessible and controllable in terms of parental supervision (Livingstone, 2009). Families have difficulties reducing their children's dependence on complex digital technologies, guiding their children, and meeting their children's demands and needs (Ofcom, 2016).

De Moor et al. (2008) categorized online hazards into three classes: content hazards, contact hazards, and commercial hazards (Sasson, 2015). Content hazards refer to content that children may be exposed to that is disturbing for them, such as violence, racism, pornography, and content containing false information. Commercial hazards include games with hidden offers to sell products to children, brand communities that target young people and encourage conscious consumption, and planned advertisements to sell drinks and food to children. Contact hazards involve behaviors that may lead to risky situations, such as sexual harassment, cyberbullying, threats to privacy, and contact with strangers.

While adolescents and children can be exposed to content and commercial hazards on television, exposure to contact hazards is specific to the internet environment. One of the developmental tasks of adolescence is to establish social relationships. Friendships formed on the Internet provide emotional support, encouragement, and advice

ISSN: 2149-5939

to adolescents who aim to develop social relationships (Subrahmanyam & Smahel, 2011). Consequently, adolescents try to communicate with others and maintain these relationships consistently. These interactions within peer groups extend beyond the physical community through the Internet, leading to communication with people from different countries. As a result of these relationships, they are likely to be exposed to contact hazards such as online bullying, communicating with strangers, and the disclosure of personal information (Mesch & Talmud, 2010).

A study found that 32% of young people who use the internet received requests from strangers on social media sites, and 21% communicated with the person who made the request (Lenhart & Madden, 2007). Another study establishes a positive relation between the intensity of internet use and increased users' willingness to share personal information online. In other words, the more the internet is used, the more personal information is shared (Mesch & Beker, 2010). Additionally, it was found that young people are somehow involved in online bullying (Sasson, 2015).

All these studies highlight the importance of staying supervised in online environments and ensuring necessary controls are in place. To carry out these controls, it is essential to identify children with risky behaviors and to create and implement intervention programs for these children. However, an online risk-taking behavior measurement tool for secondary school students in Turkey needs to be implemented. To address this gap, a study will be conducted to establish the validity and reliability of a measurement instrument that can be used to define the online risk-taking behaviors of secondary school students. Developing an online risk-taking scale will be critical to protect children from dangers in online environments. In this way, children's behavior in online environments can be better understood, possible risks for children can be determined, and effective intervention methods can be developed if necessary.

2. Methodology

Ethical permission was obtained from Gazi University Ethics Commission (dated 28.12.2023 and numbered E.837243). Subsequently, permission was secured from the Ankara Governor-ship Directorate of National Education (dated 11.01.2024 and numbered E-14588481-605.99-94178892).

This research is a scale development study. One of the quantitative research methods used was a survey model.

2.1. Data

The research was conducted in the 2023-2024 academic year. The study group consists of three secondary school students from the central districts of Ankara, Turkey. The sample includes 595 students divided into groups of 30, 351, and 214 students, respectively. A simple random sampling method was used to determine the sample. The frequency, percentage, mean, and standard deviation findings of 214 secondary school students in the validity and reliability sample group are shown in Table 1 below.

Table 1. Frequency, percentage, mean, and standard deviation findings of the participants

	Average	S.D.			f	%
Age	13,19	1,60	Gender	Male	114	53,3
				Female	100	46,7

When Table 1 is analyzed, it is observed that 114 (53.3%) of the students participating in the study were male and 100 (46.7%) were female, with an average age of 13.19.

2.2. Data collection tools

Online Risk Taking Scale, -Turkish name is Çevrimiçi Risk Alma Ölçeği- to evaluate the online risk-taking levels of adolescents, the final version of the scale consisting of 14 items was developed by the researchers. The scale includes 14 questions, all of which are related to online behaviors performed in the last six months. It covers various online risky behaviors considered risky (e.g., sharing identity information, meeting face-to-face with people met online). In the Likert-type scale, the values 1, 2, 3, 4, and 5 correspond to the statements ‘not true, rarely true, sometimes true, usually true, always true’ respectively. A minimum of 14 and a maximum of 70 points can be obtained from the scale. High scores indicate that students engage in more online risky behaviors. An average score for the questions was calculated as (70+14)/2 = 42; a higher score indicates more online risky behaviors.

Mindfulness Sacele for Children and Adolescents was developed by Greco et al. (2011) to measure the mindfulness skills of children and adolescents aged nine years and older. While mindfulness is frequently measured in adults,

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the lack of a measurement tool for children and adolescents led to the development of this scale. The scale includes negatively worded items and consists of 10 reverse-coded items. It is a self-report scale with a 5-point Likert-type response format: "not true, rarely true, sometimes true, usually true, always true." The Cronbach Alpha coefficient for the scale was found to be .81. While it is recommended to use multi-factor structures in mindfulness scales for adults, a single-factor structure was obtained for this scale due to the developmental characteristics of children. A high score on the scale indicates high mindfulness. The single-factor structure may be due to the underdevelopment of this skill at an early age compared to adults. In Turkey, the adaptation study of the scale was carried out by Çıkrıkçı (2016), and its usability was tested. The adaptation studies involved 660 children and adolescents attending grades 5 to 11. As a result of Confirmatory Factor Analyses, a single-factor structure was observed, unlike the original scale. Item analyses assessed each item's adequacy in measuring participants' attitudes. Following the analyses, two items were removed from the scale to achieve a single-factor structure. The Conscientiousness Scale for Children and Adolescents was found to be a reliable measurement tool with an internal consistency of .73 (Çıkrıkçı, 2016). Permission was obtained from the original developers of the scale for its use.

Personel Information Form was created by the researcher that includes some demographic information about the children participating in the study.

2.3. Development of the scale and collection of data

First, ethical permission was obtained from Gazi University Ethics Commission (dated 28.12.2023 and numbered E.837243). Subsequently, permission was secured from the Ankara Governorship Directorate of National Education (dated 11.01.2024 and numbered E-14588481-605.99-94178892). Initially, an item pool consisting of 30 items was created by reviewing the literature on the research objectives. For face and content validity, the opinions of six experts (five child development experts and one statistical expert) were solicited. The 30-item scale was prepared in a five-point Likert format based on the expert opinions.

After obtaining the necessary permissions, public secondary schools in Ankara province were visited for the application in the 2023-2024 academic year. Before participating in the study, consent forms were obtained from the parents, and participation consent forms were collected from the secondary school students. Only those who filled out these forms were included in the study. The draft form, created based on expert opinions, was initially applied to 30 secondary school students in a face-to-face classroom setting. This preliminary application aimed to determine the items' readability, the scale's response time, and any parts the students did not understand. Following this, the scales were prepared online, and a trial application was conducted with 351 secondary school students.

Initial analyses were conducted using IBM SPSS 2 with the data collected from the trial application. Exploratory factor analysis was used to determine the validity levels, and Cronbach's alpha coefficient was employed to assess reliability levels. After the trial application, items considered potentially misunderstood were removed based on the analysis results, reducing the number of items in the scale to 20. The wording of the scale items was also shortened and made more understandable. The finalized 20-item scale was then applied to a different group of 214 secondary school students, and detailed reporting of the collected data was undertaken. With the data collected from these 214 students, the validity and reliability study of the scale was conducted. All collected data were analyzed using IBM SPSS 2. Both exploratory factor analysis and confirmatory factor analysis were performed to determine the validity levels. Cronbach's α coefficient and McDonald's Omega (ω) coefficient were analyzed to assess reliability levels.

As a result of these analyses, the scale was refined to 14 items, and a single factor was determined to explain the scale. Additionally, to calculate the criterion validity of the scale, its correlation with the Mindfulness Scale presented to the participants in the same questionnaire form was examined. According to the results of Pearson correlation analysis, a positive and significant correlation was found between the Online Risk-Taking Scale for Adolescents and the Mindfulness Scale. This significant positive correlation indicates that the Online Risk Taking Scale for Adolescents meets the criterion validity.

In conclusion, a valid and reliable measurement tool has been developed, which will contribute to the literature by determining adolescents' online risk-taking levels.

3. Findings

In this study, data were collected from 214 participants using an online questionnaire to conduct validity and reliability analyses of the scale developed to determine the online risk-taking levels of secondary school students. The first version of the scale, consisting of 20 items, is shown in Table 2. The 9th, 10th, 13th, 16th, and 19th items

ISSN: 2149-5939

were determined to be reverse items and were reverse-coded before proceeding to the analyses. Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) methods were used to determine validity levels, while Cronbach's alpha and McDonald's omega coefficients were used to assess reliability.

Table 2. First version of the scale

Scale items	Not true	Rarely true	Some-times it's true	Usually correct	Always right
1. I share my own identity information.					
2. I share my address details.					
3. I share my parents' credit card details.					
4. I share my images on social media sites.					
5. I click to access content such as gifts, discounts, prize money, etc.					
6. I open e-mails from people I do not know.					
7. I click on adverts that interest me.					
8. I set my profile information, including personal information, as public.					
9. I don't open my camera to people I don't know.					
10. I do not enter illegal gaming sites (betting, gambling, gaming) to earn money. *					
11. I participate in video challenges.					
12. I try to access sites related to sexuality.					
13. I open e-mails from people I know.					
14. I use fake accounts to follow others without letting them know.					
15. I meet people I meet on the Internet face to face outside.					
16. I do not try to enter prohibited sites.					
17. I send sexually explicit messages to others.					
18. I share personal information such as parents' name-surname and occupation.					
19. I don't share our phone number.					
20. I present myself as someone great or someone different.					
* Reverse coded items					

Before the exploratory factor analysis, the Cronbach's alpha coefficient and the corrected item-total correlations of the scale items were analyzed to determine whether an item negatively affected the scale's reliability. In the first analysis, Cronbach's alpha coefficient was found to be 0.788, and the corrected item-total correlations for the 9th, 10th, 13th, 16th, and 19th items were between -0.182 and 0.184. These items were excluded from the analyses as they were thought to be not fully understood by the participants due to their inverted expressions, thus reducing the scale's reliability. In the second reliability analysis conducted with the remaining items, Cronbach's alpha coefficient was 0.914. The findings of this reliability analysis are shown in Table 3. Since none of the items decreased the reliability coefficient of the scale, the exploratory factor analysis phase was initiated.

Table 3. Initial Cronbach's alpha (reliability) analysis findings

Scale items	Corrected item-total correlations	Cronbach's Alpha when the item is deleted
1. I share my own identity information.	,623	,908
2. I share my address details.	,662	,907
3. I share my parents' credit card details.	,823	,905
4. I share my images on social media sites.	,540	,912
5. I click to access content such as gifts, discounts, prize money, etc.	,742	,906
6. I open e-mails from people I do not know.	,657	,907
7. I click on adverts that interest me.	,583	,910
8. I set my profile information, including personal information, as public.	,719	,906
11. I participate in video challenges.	,609	,909
12. I try to access sites related to sexuality.	,573	,910
14. I use fake accounts to follow others without letting them know.	,604	,909
15. I meet people I meet on the Internet face to face outside.	,707	,906
17. I send sexually explicit messages to others.	,831	,905
18. I share personal information such as parents' name-surname and occupation.	,653	,907
20. I introduce myself as someone great or different.	,398	,922

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In the exploratory factor analysis conducted to test the scale's validity, the Kaiser-Meyer-Olkin (KMO) and Bartlett's test were used to determine the scale's suitability for factor analysis.

The KMO value was found to be 0.928, indicating that the sample size was sufficient. Additionally, Bartlett's test result was significant, indicating that the scale was suitable for factor analysis (X2 (105) = 1931.786, p < .01). In the factor analysis, the factor loadings of the items were examined using Varimax rotation. The 20th item, with a factor loading below 0.60, was removed, and the analysis was repeated.

In the second and final factor analysis, the KMO value was 0.927, and Bartlett's test result was significant (X2 (91) = 1883.213, p < .01) (Table 4).

Table 4. Kaiser-Meyer-Olkin and Bartlett results of the final EFA

Kaiser-Meyer-Olkin Measure of Sampling Adequacy		,927
Bartlett's Test of Sphericity	X^2	1883,213
	df	91
	p	,000

This analysis showed that a single factor could explain the scale. The eigenvalue of this factor was 7.476, explaining 53.402% of the total variance of the scale. The scale's validity is high since this value is more than 50%. The findings regarding the factor eigenvalues are shown in Table 5. Additionally, the scree plot created according to the calculated factors is shown in Figure 1. The findings related to the factor loadings of the scale items are shown in Table 6. As a result of the analyses, the scale was reduced to 14 items and was explained by a single factor.

Table 5. Factor Eigenvalue findings related to EFA

Factor	Initial Eigenvalues		
	Total	Percent variance	Cumulative percentage
1	7,476	53,402	53,402
2	,956	6,825	60,227
3	,904	6,454	66,682
4	,775	5,533	72,215
5	,637	4,552	76,767
6	,565	4,036	80,803
7	,543	3,881	84,684
8	,479	3,421	88,105
9	,428	3,054	91,159
10	,340	2,431	93,590
11	,330	2,360	95,950
12	,255	1,822	97,772
13	,222	1,589	99,361
14	,090	,639	100,000

Subtraction method: Principal Component Analysis.

Figure 1. Slope accumulation graph to vectors

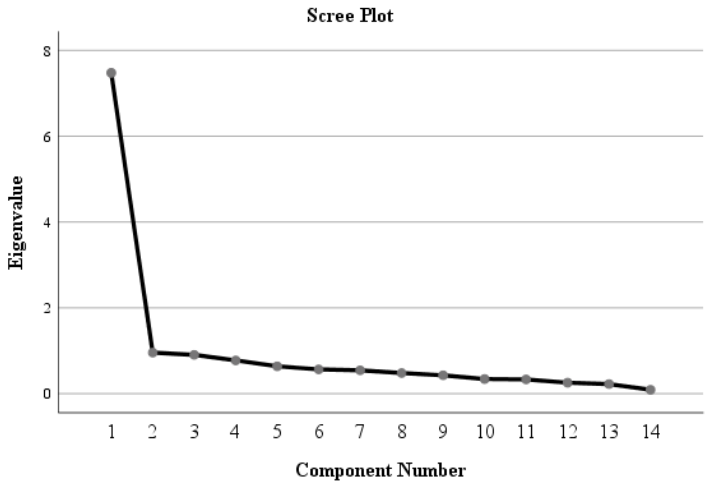

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Table 6. Factor loadings of scale items

	Factor loadings
1. I share my own identity information.	,689
2. I share my address details.	,712
3. I share my parents' credit card details.	,883
4. I share my images on social media sites.	,591
5. I click to access content such as gifts, discounts, prize money, etc.	,813
6. I open e-mails from people I do not know.	,713
7. I click on adverts that interest me.	,608
8. I set my profile information, including personal information, as public.	,780
11. I participate in video challenges.	,666
12. I try to access sites related to sexuality.	,646
14. I use fake accounts to follow others without letting them know.	,639
15. I meet people I meet on the Internet face to face outside.	,791
17. I send sexually explicit messages to others.	,892
18. I share personal information such as parents' name-surname and occupation.	,727
Eigenvalue	7,476
Explained variance (%)	53,402
Cronbach's alpha	,922
McDonald's omega	,932

The reliability coefficients calculated for all the remaining items of the scale after the factor analysis were 0.922 (Cronbach's alpha) and 0.932 (McDonald's omega) (Table 7). These values indicate that the scale's reliability is relatively high.

Table 7. Cronbach's alpha and McDonald's omega (reliability) analysis findings after EFA

	Corrected item-total correlations	Cronbach's Alpha when item deleted	When the article was deleted, McDonald's omega
1. I share my own identity information.	,627	,917	,929
2. I share my address details.	,668	,916	,928
3. I share my parents' credit card details.	,828	,913	,922
4. I share my images on social media sites.	,547	,921	,932
5. I click to access content such as gifts, discounts, prize money, etc.	,751	,913	,925
6. I open e-mails from people I do not know.	,656	,916	,928
7. I click on adverts that interest me.	,563	,920	,931
8. I set my profile information, including personal information, as public.	,724	,914	,926
11. I participate in video challenges.	,615	,918	,930
12. I try to access sites related to sexuality.	,582	,918	,930
14. I use fake accounts to follow others without letting them know.	,594	,919	,930
15. I meet people I meet on the Internet face to face outside.	,726	,914	,926
17. I send sexually explicit messages to others.	,838	,913	,921
18. I share personal information such as parents' name-surname and occupation.	,662	,916	,928

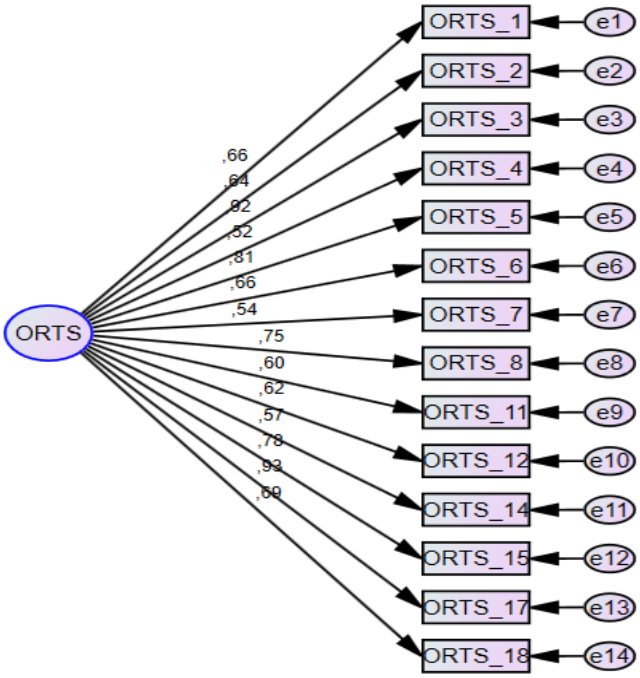
Confirmatory factor analysis (CFA) was applied to verify the fit level of the factor obtained after EFA. The CFA fit indices of the scale model are shown in Table 8, and the CFA model of the scale is shown in Figure 2.

Table 8. CFA model fit indices of the scale

Indexes	Index values of the created model	Normal reference value	Acceptable reference value
CMIN/DF	1,892	<2	<5
CFI	,965	>,95	>,90
NFI	,930	>,95	>,90
RMSEA	,065	<,06	<,10
GFI	,918	>,95	>,90
AGFI	,880	>,95	>,90

ISSN: 2149-5939

Figure 2. CFA model of the scale



After the EFA, it was determined that the scale had a single-factor structure. The CFA fit indices of the scale model created according to this sub-factor are found in Table 8. According to the analysis, the CMIN/DF value was 1.892, below the standard reference value. The CFI and NFI values were 0.965 and 0.930, respectively, at the standard reference level (Baumgartner & Homburg, 1996; Marsh et al., 2006). The RMSEA value was also 0.065, which is acceptable (Byrne, 2001; Hu & Bentler, 1999). The GFI value was 0.918, above the acceptable level (Baumgartner & Homburg, 1996). Finally, the AGFI value was 0.880, which, although below the acceptable reference value of 0.90, is considered acceptable because it is close to the reference value (Schermelleh-Engel et al., 2003). These findings demonstrate that the construct validity of the scale is at an acceptable level.

To calculate the criterion validity of the scale, its correlation with the Mindfulness Scale, presented to the participants in the same questionnaire form, was examined. Since a single factor explained the Online Risk Taking Scale for Adolescents after the exploratory factor analysis, the online risk-taking variable for adolescents was created by calculating a mean score for the 14 items shown in Table 6. Additionally, the mean score for the eight items of the Mindfulness Scale was calculated to create the mindfulness level variable. Descriptive statistics for these variables are given in Table 9.

Table 9. Descriptive findings related to scales

	Average	S.S.	Multiply	Basque.
Online Risk-Taking Scale for Adolescents	1,24	,25	1,405	1,760
Mindfulness Scale	2,37	,87	,744	,335

Table 10. Pearson Correlation Analysis results for criterion validity

		Online Risk Taking Scale for Adolescents	Mindfulness Scale
Online Risk Taking Scale for Adolescents	r	1	,371
	p	-	,000
	N	214	214
Mindfulness Scale	r	,371	1
	p	,000	-
	N	214	214

The average risk-taking level of the participants was found to be 1.24±0.25, and the average level of mindfulness was found to be 2.37±0.87. Skewness and kurtosis coefficients were examined to determine whether these variables fit the normal distribution. Coefficients between -1.5 and +1.5 indicate that the variables fit the normal

ISSN: 2149-5939

distribution and meet the normality assumption (Tabachnick & Fidell, 2013). The skewness and kurtosis values shown in Table 8 are within this specified range, indicating that the variables meet the assumption of normal distribution. Therefore, Pearson correlation analysis was used to analyze the correlation coefficient between the variables.

According to the Pearson correlation analysis results in Table 10, a positive and significant correlation was found between the Online Risk Taking Scale for Adolescents and the Mindfulness Scale ($r = .371$, $p < .001$). This result suggests that as the mindfulness level of participants increases, their risk-taking levels also increase. The significant and positive correlation between the Online Risk-Taking Scale for Adolescents and the Mindfulness Scale indicates that the scale also meets the validity criterion.

4. Discussion, conclusion, and recommendations

The digital environment is a fundamental part of daily life for all individuals, offering enormous benefits and new channels for creativity, education, and social interaction. However, it also brings serious risks, such as blackmail, cyberbullying, and privacy concerns, especially for children. Therefore, creating a safe digital environment and providing children with the necessary digital skills to address these increasing risks is crucial. Consistent policies, training programs, and procedures are needed to balance the opportunities the digital environment offers and protect children from risks.

The first step is to identify children who engage in online risky behaviors. In the research aimed at developing a scale to determine the online risk-taking levels of children aged 10-13, data obtained from the draft scale were analyzed through a series of statistical analyses.

In the reliability analysis, Cronbach's alpha coefficient was 0.914. Since no item decreased the scale's reliability coefficient, the exploratory factor analysis phase was started.

In the exploratory factor analysis (EFA) conducted to test the scale's validity, Kaiser-Meyer-Olkin (KMO) and Bartlett's test were used to determine the scale's suitability for factor analysis. The KMO value was found to be 0.928, indicating that the sample size was sufficient. Additionally, Bartlett's test result was significant, indicating that the scale was suitable for factor analysis, $X2\ (105) = 1931.786$, $p < .01$. The factor loads of the items were examined using Varimax rotation. The 20th item, with a factor loading below 0.60, was removed, and the analysis was repeated. In the second and final factor analysis, the KMO value was 0.927, and Bartlett's test result was significant, $X2\ (91) = 1883.213$, $p < .01$. The eigenvalue of this factor was 7.476, explaining 53.402% of the total variance of the scale. This high value indicates that the scale's validity is robust.

The reliability coefficients calculated for all the remaining items of the scale after the factor analysis were 0.922 (Cronbach's alpha) and 0.932 (McDonald's omega) (Table 6), indicating that the scale's reliability is relatively high.

After the EFA, it was determined that the scale had a single-factor structure. The CFA fit indices of the scale model created according to this sub-factor were analyzed. The CMIN/DF value was 1.892, below the standard reference value. The CFI and NFI values were 0.965 and 0.930, respectively, at the standard reference level (Baumgartner & Homburg, 1996; Marsh et al., 2006). The RMSEA value was also 0.065, an acceptable level (Byrne, 2001; Hu & Bentler, 1999). The GFI value was 0.918, above the acceptable level (Baumgartner & Homburg, 1996). Finally, the AGFI value was 0.880, which, although below the acceptable reference value of 0.90, is considered acceptable as it is close to the reference value (Schermelleh-Engel et al., 2003). These findings indicate that the scale's construct validity is acceptable.

To calculate the criterion validity of the scale, its correlation with the Mindfulness Scale presented to the participants in the same questionnaire form was examined. The average risk-taking level of the participants was 1.24 ± 0.25, and the average mindfulness level was 2.37 ± 0.87. Skewness and kurtosis coefficients were analyzed to determine whether these variables fit the normal distribution. Coefficients between -1.5 and +1.5 indicate that the variables fit the normal distribution and meet the normality assumption (Tabachnick & Fidell, 2013). The skewness and kurtosis values were within this specified range, indicating that the variables meet the standard distribution assumption. Therefore, Pearson correlation analysis was used to analyze the correlation coefficient between the variables.

According to Pearson correlation analysis results, a positive and significant correlation was found between the Online Risk Taking Scale for Adolescents and the Mindfulness Scale, $r = .371$, $p < .001$. This result suggests that as the mindfulness level of participants increases, their risk-taking levels also increase. The significant and positive

ISSN: 2149-5939

correlation between the Online Risk-Taking Scale for Adolescents and the Mindfulness Scale indicates that the scale also meets the validity criterion.

This research found that the online risk-taking scale developed for adolescents is valid and reliable. Researchers can use the scale to determine the online risk-taking levels of secondary school students.

Developing an online risk-taking scale is crucial to protect children from dangers in online environments. In this way, children's behavior in online environments can be better understood, and they can be more aware of the dangers. Potential online risks for children and personal factors affecting online risk behaviors can be identified. In light of the information obtained, effective intervention methods can be developed to prevent online risky behavior. According to the scale results, parents and educators can be guided in ensuring their children's online safety. Special measures can be developed for children who engage in risky behavior online. It can contribute to developing preventive and protective programs to raise awareness about online security in environments such as schools and private teaching institutions where children are included. As a result of the data obtained, it is necessary to make legal regulations and develop effective policies to ensure children's online safety.

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Disclosure statement

The authors reported no potential competing interest.

Ethical committee approval

Ethical permission was obtained from Gazi University Ethics Commission (dated 28.12.2023 and numbered E.837243). Subsequently, permission was secured from the Ankara Governor-ship Directorate of National Education (dated 11.01.2024 and numbered E-14588481-605.99-94178892). All responsibility belongs to the authors.

ISSN: 2149-5939