



Development of the Need Satisfaction Perceived Online Scale*

Çevrim İçi Algılanan İhtiyaç Doyumu Ölçeği'nin Geliştirilmesi

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Abstract

This study aimed to develop the Need Satisfaction Perceived Online Scale to measure individuals' satisfaction of perceived basic psychological needs in online environments. The sample of the study consisted of a total of 856 university students aged between 18-25 years, 251 (184 Female, 67 Male) for scale adaptation study, 346 (277 Female, 69 Male) to perform exploratory factor analysis for scale development study and 289 (227 Female, 62 Male) to perform confirmatory factor analysis. Data collection instruments included "The Need Satisfaction Perceived Online Scale", "The Basic Needs Satisfaction Scale of College Students", "The Self-Disclosure Scale" and "Personal Information Form". A scale of 12 items and 3 sub-scales was obtained, explaining 57.9% of the total variance. The observed fit values showed good fit. Significant positive correlations were obtained between the sub-scales of the instrument used for evaluating criterion-related validity and those of the corresponding developed scale ($p < .01$). Likewise, significant correlations were established between the sub-scales of the instrument utilized in the examination of discriminant validity and those of the developed scale ($p < .01$). The Cronbach's Alpha coefficient was determined to be .80 for the entire scale. Based on the findings, the developed scale was valid and reliable.

Keywords: Need satisfaction perceived online, online autonomy, online relatedness, online competence, scale development.

Öz

Bu çalışmanın amacı kişilerin internet ortamında algıladıkları psikolojik ihtiyaçlarının doyumunu ölçmek için ölçüm aracı geliştirmektir. Çalışmanın örneklemini, yaşları 18-25 arasında değişen, ölçek uyarlama çalışması için 251 (184 Kadın, 67 Erkek), ölçek geliştirme çalışması için açıklayıcı faktör analizini gerçekleştirmek üzere 346 (277 Kadın, 69 Erkek) ve doğrulayıcı faktör analizi gerçekleştirmek üzere 289 (227 Kadın, 62 Erkek) olmak üzere toplam 856 üniversite öğrencisinde oluşmaktadır. Veri toplama araçları olarak "Çevrim İçi Algılanan İhtiyaç Doyumu Ölçeği", "Kendini Açma Ölçeği", "Üniversite Öğrencilerinin Temel İhtiyaçlarının Doyumu Ölçeği" ve kişisel bilgi formu kullanılmıştır. Çalışmanın bulguları, 12 madde ve 3 alt boyuttan oluşan bir ölçek ortaya çıkarmıştır. Tüm ölçek için açıklanan varyans %57,9 olarak bulunmuştur. Yapı geçerliği çalışması kapsamında ölçek doğrulayıcı faktör analizi ile de test edilmiştir. Gözlenen uyum değerlerinin iyi uyum gösterdikleri tespit edilmiştir. Ölçüt bağımlı geçerlik için yapılan analiz için kullanılan ölçeğin alt boyutları ile geliştirilen ölçeğin alt boyutları arasında olumlu yönde anlamlı korelasyonlar saptanmıştır ($p < .01$). Ayırt edici geçerlik çalışmasının bulguları da anlamlı korelasyonlar ortaya çıkarmıştır ($p < .01$). Cronbach Alfa katsayısı ölçeğin bütünü için .80 olarak bulunmuştur. Tüm analizlerin sonucu geliştirilen ölçeğin güvenilir ve geçerli olduğunu göstermiştir.

Anahtar kelimeler: Çevrim içi algılanan ihtiyaç doyumunu, çevrim içi yeterlik, çevrim içi özerklik, çevrim içi ilişkili olma, ölçek geliştirme.

* This study was carried out within the scope of the PhD thesis titled "The mediating role of online self-disclosure and need satisfaction perceived online in the relationship between online friendship and subjective well-being". The study was also presented as an oral presentation at the VIII: Turkcess International Education and Social Sciences Congress.



Introduction

Self-determination theory argues that it is essential to consider individuals' inherent psychological needs for competence, autonomy and relatedness in comprehending human motivation (Deci & Ryan, 2000). The fulfillment of these fundamental psychological needs is essential for the healthy development of individuals, irrespective of their cultural background (Chirkov, Ryan, Kim & Kaplan, 2003; Ryan & Deci, 2000; Véronneau, Koestner & Abela, 2005). Satisfying these fundamental psychological needs is essential for maintaining a state of mental health and overall well-being (Andersen, 2000; Kasser & Ryan, 1999; Ryan, 1995; Sheldon, Ryan & Reis, 1996).

Autonomy refers to the will, which includes the feeling that one's behavior originates from and is approved by oneself, rather than independence. When one's actions are characterized by a sense of freedom and selectivity, one feels autonomous (Kasser & Ryan, 1999). The need for relatedness entails the longing to establish and maintain connections with others, such as feelings of love, being loved, caring, and being cared for (Deci & Ryan, 2000). The need for competence refers to the individual's sense of mastery and effectiveness in controlling and influencing their social environment and outcomes (Deci & Ryan, 2002; Ryan & Deci, 2001) Individuals' perceived sense of competence is related to how successful and effective they feel in reaching a goal (Reis, Sheldon, Gable, Roscoe & Ryan, 2000; Williams, Gagné, Ryan & Deci, 2002).

Today, online environments and online communication have become an essential component of daily living. The internet can provide a fast and accessible environment for the satisfaction of psychological needs (Wan & Chiou, 2006). According to Wong, Yuen and Li (2015), the internet has the potential to fulfill the needs of competence, autonomy and relatedness by allowing individuals to have control over how they present themselves, irrespective of their physical appearance or real identity. It is important to evaluate the satisfaction of psychological needs online and to associate it with well-being (Wang, Tao, Fan & Gao, 2015). Media consumption offers fast and attractive ways to meet these needs (Rieger & Vorderer, 2017). Lewis, Weber and Bowman (2008) that particularly, interactive media, online virtual environments and online game sites give users a sense of approaching problems in their own way (autonomy), mastery in solving a task (competence) and connecting with other players and virtual characters (relatedness).

The digital era has brought about a range of online services that cater to the satisfaction of needs (Wu, Qiao & Liu, 2022). Individuals may resort to online environments to compensate for their unfulfilled psychological needs in real life (Liu et al., 2016). For instance, smartphones can contribute to people's need satisfaction by offering increased opportunities for social interaction and problem solving (Orben, 2020). Prolonged smartphone usage might be related to increased perceived online need satisfaction (Wu, Qiao & Liu, 2022). People who fulfill their basic psychological needs online spend more time on the Internet and use it more frequently (Shen, Liu & Wang, 2013). People will use the internet more freely and thus benefit more from their online experiences, as long as their continuous online activities foster feelings of relatedness, autonomy and competence (Hopp, 2015).

Moreover, online communication can meet psychological needs and thus, can enhance an individual's social self-efficacy and increase the level of subjective well-being (Li, Shi & Dang, 2014). Perceived online satisfaction of basic psychological needs is also a predictor of positive emotions experienced in online environments (Shen, Liu & Wang, 2013). Another study reported that the satisfaction of needs perceived online was a predictor of well-being and individuals who

experienced higher satisfaction of needs in their daily life were more likely to gain benefit from the online environment for need satisfaction (Wang et al., 2015)

According to a study conducted with adolescents, it was discovered that they are more inclined to seek satisfaction in online environments if they recognize that the internet can better fulfill their needs compared to real life (Liu et al., 2016). Perceived online satisfaction of basic psychological needs was found to positively predict adolescents' addiction to smartphones (Chen, Lin & Liu, 2020) and pathological internet use (Liu, Fang, Wan & Zhou, 2016). The study, examining the relationship between need satisfaction perceived online and social network addiction, revealed that online autonomy, relatedness, and competence needs predicted the development of social network addiction (Liu, Hu & Qi, 2022).

When examining the literature, studies measuring need satisfaction perceived online have generally been carried out by adapting existing scales to the online environment. For example, Shen, Liu and Wang (2013) adapted a 12-item scale based on previous studies. Items for perceived autonomy were taken from the study by Standage, Duda & Ntoumanis (2005) and phrases such as "when I am online, when using the internet" were added to the items. For perceived competence, items of the "Perceived Competence Subscale of the Intrinsic Motivation Inventory" (IMI; McAuley, Duncan & Tammen, 1989) were used, and for perceived relatedness, items of "the Acceptance Subscale of the Need for Relatedness Scale" (Richer & Vallerand, 1998) were used and all the items were arranged according to the study context. Other studies in the literature have also used this adapted scale to collect data (Liu et al., 2016; Liu, Hu & Qi, 2022; Liu, Huang & Zhou, 2020; Wu, Qiao & Liu, 2022). Similarly, Schmitt (2021) measured online need satisfaction by adapting a previously developed scale and adding the phrase "while taking part in this online activity" to the beginning of each item.

Wang et al. (2015) developed a scale called the "Basic Psychological Needs in the Online World Scale". The scale consists of a total of 13 items and three sub-dimensions: autonomy, relatedness and competence. Examples of items from the scale include "*I really like the people I interact with*", "*I generally feel free to express my ideas and opinions*", "*I have been able to learn interesting new skills recently*". The expressions in the scale items were designed to evaluate both daily life and the online environment and thus, the scale did not solely focus on the online environment (Wang et al., 2015).

As can be seen, there are some adapted and developed scales to measure need satisfaction perceived online. The most commonly used scale in the literature is the one adapted by Shen, Liu and Wang (2013). However, no scale adapted or developed in this field has been found in Turkey. This issue is considered as a significant variable in current studies, yet no study has been found in Turkey that examines need satisfaction perceived online. Therefore, this study aimed to develop a measurement tool to assess need satisfaction perceived online, and to contribute to the literature in this area.

Method

In this study, the Turkish adaptation study of the "Need Satisfaction Perceived Online" scale, which was adapted by Shen, Liu and Wang (2013) to the online environment, was conducted as the first step. As the factor analysis results of the adapted scale were not significant, a scale development study was subsequently performed. Details about both of these studies are provided below.

Study 1. Turkish Adaptation Study of “Need Satisfaction Perceived Online” Scale

This study aimed to realize the Turkish adaptation study of the "Need Satisfaction Perceived Online" scale, which was adapted to the online environment by Shen, Liu and Wang (2013). This scale was created by adapting existing scales to the online environment. The scale was developed by adapting existing measures to assess participants' perceived psychological need satisfaction while online. The scale comprises 12 items and contains subscales for relatedness, autonomy, and competence. The scale uses a 7-point Likert scale, with responses ranging from “1= strongly disagree” to “7=strongly agree”. The Cronbach's Alpha coefficient of the scale was calculated as .92 for the entire scale, .82 for autonomy, .85 for competence, and .86 for relatedness.

The scale has not yet been adapted to Turkish. Permission to do so was obtained from the relevant researchers via email, and the Turkish adaptation process was initiated. Firstly, six linguists who are fluent in both languages were asked to translate the scale. Next, the translations were reviewed and the Turkish version of the scale was finalized. Two Turkish experts were consulted to ensure there were no semantic errors, and language consistency was evaluated using an expert evaluation form. To assess the linguistic equivalence of the final translation, both the English and Turkish versions were administered to 32 participants, who are fluent in both languages, two weeks apart. The correlation between the total scores of the English and Turkish forms was found to be .86 ($p < .01$).

Sample

The participants of this study were composed of university students from various departments. The sample was determined by convenience sampling. The data of this study were collected during the academic term of spring 2020-2021. Since online education was conducted due to the pandemic on the relevant dates, the students could not be reached face-to-face and the data were collected through "Google Forms". A total of 251 university students (184 female, 67 male) between the ages of 18 and 25 were included in the sample.

Data Analysis

In study 1, to perform exploratory factor analysis (EFA), IBM SPSS Statistics 20 was used.

Study 2. The Study of Development of the Need Satisfaction Perceived Online Scale

This study aimed to develop a new scale after the Turkish adaptation of the “Need Satisfaction Perceived Online” scale did not yield the desired results. To determine the criterion validity of the scale, “The Basic Needs Satisfaction Scale of College Students (BNSC-S)” (Şimşir, Arslan & Dilmaç, 2020) was included, and to assess its discriminant validity, “The Self-Disclosure Scale” (Öksüz, Mersin & Türker, 2017) was included.

Sample

In order to develop the scale, university students (15 Female and 15 Male) were interviewed and the relevant literature was reviewed. For the scale development study, 346 (277 Female, 69 Male) university undergraduate students aged between 18-25 and studying in different departments were reached. EFA was conducted on the data collected from this sample. A new sample of 289 university students (227 female, 69 male) was reached for confirmatory factor analysis (CFA). All the sample was selected by convenience sampling method. The data were collected face-to-face during the fall and spring semesters of 2021-2022.

Instruments

The Need Satisfaction Perceived Online Scale: This scale was developed to measure need satisfaction perceived online. The item pool was created by interviewing undergraduate students (15 Female, 15 Male) and reviewing the literature. The final form was created by selecting the items from the item pool by taking expert opinion. The resulting scale consists of 16 items and respondents are required to provide their rating on a 5-point Likert scale. Based on the literature review, it was determined that the scale could have three sub-dimensions: autonomy, competence and relatedness. Items 1-6 of the scale constitute the online autonomy sub-dimension, items 7-11 form the online competence sub-dimension, and items 12-16 form the online relatedness sub-dimension. Scoring can be done separately for each sub-dimension.

The Self-Disclosure Scale: The scale was originally developed by Wheelless and Grotz (1976) and adapted by Chen and Marcus (2012) to be used for both face-to-face and online self-disclosure. Turkish adaptation studies were carried out by Öksüz, Mersin and Türker (2017). The scale employs a 7-point Likert-type rating and comprises 16 items in total. High scores on the scale indicate a high level of self-disclosure. The Cronbach's alpha coefficient was determined as .70 (Öksüz, Mersin & Türker, 2017). In this study, the scale was used to determine levels of online self-disclosure.

The Basic Needs Satisfaction Scale of College Students (BNSC-S): This scale, originally developed by Jenkins-Guarnieri, Vaughan and Wright (2015), aims to determine the levels of basic psychological needs among university students. The Turkish adaptation study was conducted by Şimşir, Arslan and Dilmaç (2020). The scale consists of 13 items and has a 5-point Likert type rating. It includes three sub-dimensions: autonomy, relatedness, and competence. The Cronbach's alpha coefficient was calculated as .79 (Şimşir, Arslan & Dilmaç, 2020).

Data Analysis

In study 2, IBM SPSS Statistics 20 was used to perform EFA and SPSS AMOS 20 was used to perform CFA.

Results

The findings of the Turkish adaptation study of the "Need Satisfaction Perceived Online" scale and "the development of the Need Satisfaction Perceived Online Scale" are presented below.

Validity Studies of Scale Adaptation

Factor Analysis: EFA method was used to determine the construct validity of the scale. Principal component analysis was used to test whether the scale is unidimensional or not, and the first factor loading values of the items were examined. The presence of items with factor loading values below .30 in the scale was determined. Therefore, it was concluded that the scale cannot be evaluated as one-dimensional. Then, factor loading values of .30 and above were taken as a basis. As a result of the principal component analysis, two factors with eigenvalues above 1 and explaining 68.2% of the variance were identified.

Considering both the sub-dimensions of the adapted scale and the literature, it was expected that online need satisfaction would have three dimensions: autonomy, competence and relatedness. However, as mentioned above, only two factors were reached as a result of factor analysis. Since the expected result was three dimensions, these two dimensions were not named. The factor analysis

continued with the Varimax orthogonal rotation method. Table 1 shows the factor loading values of the items that had a factor loading value above .30, as a result of the analysis.

Table 1. Factor Loading Values of Adapted Scale Items According to Dimensions

Items	First Dimension Factor Loading Values	Second Dimension Factor Loading Values
1		,759
2	,686	,332
3		,816
4	,501	,614
5	,413	,720
6	,725	,353
7	,841	
8	,849	
9	,883	
10	,773	
11	,696	,375
12	,836	

As shown in Table 1, two dimensions have emerged in the adapted scale, contrary to the predicted three dimensions, and the items were not distributed accordingly. The variances explained by the scale and eigenvalues are presented in Table 2

Table 2. Sub-Dimensions of the Adapted Scale and the Variances They Explained

Factors	Eigenvalues	Explained Variances
1	6,97	58,11
2	1,26	10,56
Total		68,62

As presented in Table 2, two factors were identified, with eigenvalues above 1 and explaining 68.2% of the variance. As previously mentioned, only two dimensions were obtained instead of the expected three dimensions.

To obtain the desired result, the number of factors was set to three and the analysis was repeated. However, the eigenvalue of the third factor was below 1 (.83), the items were distributed across multiple factors, and the majority of the items had high factor loading values on the first factor.

Based on these findings, the desired result was not achieved in the scale adaptation study, and further analyses related to the scale adaptation were not pursued. Therefore, a decision was made to conduct a scale development study. The second part of the study provides information on the scale development process.

Validity Studies of the Need Satisfaction Perceived Online Scale

The findings of the validity and reliability studies of the Need Satisfaction Perceived Online Scale are presented below.

Factor Analysis: Firstly, EFA method was used to determine the construct validity of the scale. Whether the scale is one-dimensional or not was tested with principal component analysis and the first factor loading values of the scale items were examined. The analysis revealed that there were

items with first factor loading values below .30 in the scale, which indicated that the scale could not be considered one-dimensional. The factor loading values of .30 and above were taken as a basis. The item selection was made by paying attention to the fact that the difference between the loading values of the factor in which the items were found and the loading values of the related items in the other factors was .10 and above. (Büyüköztürk, 2017). The principal component analysis revealed four factors with an eigenvalue above 1, which explained 57.9% of the variance.

After the principal component analysis, the four factors that emerged were not named. In order to reach the desired dimensions in the scale development, factor analysis was conducted using the Varimax orthogonal rotation method. Four items that had a factor loading difference of .10 or less, and were loading on more than one factor, were removed from the scale. As a result of all these analyses, a 3-dimensional scale consisting of 12 items was obtained. The three sub-dimensions of the scale were named as "online autonomy", "online competence" and "online relatedness". Items such as, "I have the freedom to react as I want on the Internet.", "I choose what I want to do on the Internet." can be given as examples of online autonomy sub-dimension. The following items can be given as examples of the online competence sub-dimension: "I think I am quite good in internet use skills.", "I can overcome the challenging tasks I encounter in online environments.". The following items can be given as examples of the items in the online relatedness sub-dimension: "I feel that other people understand me on the Internet.", "I feel accepted by the people I love on the Internet."

The item-total correlations within the need satisfaction perceived online scale were examined and the upper-lower group t-test was applied. The factor loading values, item-total correlations and upper-lower t values in the dimension of the items are presented in Table 3.

Table 3. Factor Structure of Need Satisfaction Perceived Online Scale Items, Item Total Correlations and Upper-Lower t Values

Factors	Items	Factor loading values	Item-total correlations	Upper-lower (%27) t values
Online Autonomy	1	.44	.46*	8,78*
	2	.86	.43*	6,96*
	3	.87	.42*	6,52*
	4	.66	.47*	8.08*
Online Competence	5	.71	.55*	9,44*
	6	.70	.54*	8,64*
	7	.79	.44*	8,40*
	8	.63	.56*	10,28*
Online Relatedness	9	.72	.61*	10,87*
	10	.81	.59*	11,75*
	11	.84	.59*	11,42*
	12	.61	.54*	9,25*

N=346, *p<.01

As shown in Table 3, the item-total correlation values calculated within each dimension were found to be significant at the .01 level. It was concluded that the upper-lower t values were also significant at the .01 level. Following the factor analysis, it was determined that 3 factors explained 57.87% of the total variance. The variances and eigenvalues explained by the sub-dimensions are provided in Table 4.

Table 4. Sub-Dimensions of the Developed Scale and the Explained Variances

Factors	Eigenvalues	Explained Variances
Online Relatedness	3,78	31,42
Online Autonomy	1,76	14,68
Online Competence	1,41	11,77
Total		57,87

When examining Table 4, it can be observed that the total variance explained by the scale is 57.87%. The variance explained by the online relatedness sub-dimension was 31.42%, the variance explained by the online autonomy sub-dimension was 14.68%, and the variance explained by the online competence sub-dimension was 11.77%. Table 5 displays the central distribution and variability measures of the scale.

Table 5. Central Distribution and Variability Measures According to the Sub-Dimensions of the Developed Scale

Factors	\bar{X}	sd	Range	Maximum Score	Minimum Score
Online Autonomy	15,65	2,86	14	20	6
Online Competence	14,88	2,98	15	20	5
Online Relatedness	13,72	3,36	16	20	4

To determine the criterion-related validity, the correlations between the sub-scales of “The Basic Needs Satisfaction Scale of College Students (BNSC-S)” and the sub-scales of the developed scale were examined. The results of the relevant correlation analysis are shown in Table 6.

Table 6. The Relationship Between the Sub-Scales of the Developed Scale and the Sub-Scales of the BNSC-S

Variable	1	2	3	4	5	6
1. Online Autonomy	-	.348**	.280**	.181**	.097	.179**
2. Online Competence	.348**	-	.389**	.236**	.195**	.159**
3. Online Relatedness	.280**	.389**	-	.120**	.099	.170**
4. Autonomy	.181**	.236**	.120**	-	.547**	.422**
5. Competence	.097	.195**	.099	.547**	-	.457**
6. Relatedness	.179**	.159**	.170**	.422**	.457**	-

** : $p < 0,01$.

When Table 6 is examined, low-level significant positive correlations were found between online autonomy and autonomy (.181**, $p < 0,01$), online competence and competence (.195**, $p < 0,01$), online relatedness and relatedness (.170**, $p < 0,01$). To determine the discriminant validity, the correlations between the sub-scales of the scale and the sub-scales of the online version of the Self Disclosure Scale were examined. The outcomes of the correlation analysis are presented in Table 7.

Table 7. The Relationship between the Sub-Scales of the Developed Scale and the Sub-Scales of the Self-Disclosure Scale

Variable	Intent	Amount	Positivity	Honesty	Control
Online Autonomy	.327**	-.039	.066	.290**	-.036
Online Competence	.262**	.044	.154**	.168**	.107*
Online Relatedness	.202**	.071	.202**	.181**	.137*

*: $p < 0,05$, **: $p < 0,01$.

As shown in Table 7, the intent and honesty sub-dimensions showed low-level positive correlations with all the sub-dimensions of the Need Satisfaction Perceived Online Scale, while the positivity and control sub-dimensions showed low-level correlations only with the competence and relatedness sub-dimensions. The amount sub-dimension did not show any significant correlation with any of the sub-dimensions.

The Confirmatory Factor Analysis Results of the Need Satisfaction Perceived Online Scale

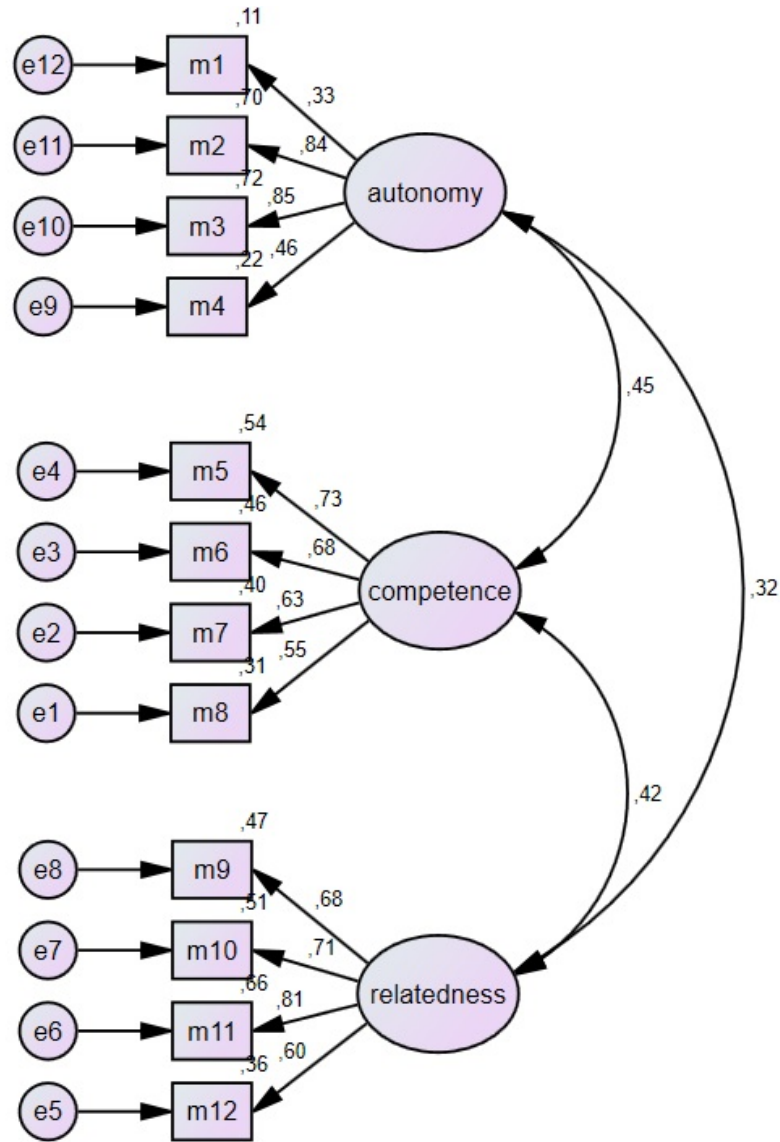
In line with the validity studies of the scale, CFA was also used to investigate the construct validity. CFA of the 12-item scale determined after EFA was performed on a new sample group of 289 (227 Female, 62 Male) university students. CFA is a kind of structural equation modeling that examines the relationships between indicators or observed measures and latent factors or variables, especially dealing with measurement models (Brown & Moore, 2012). In this respect, CFA was used to examine the structural validity of the three factors that emerged from the EFA. The fit indices obtained as a result of CFA are presented in Table 8 and the standardized coefficients are shown in the diagram in Figure 1.

Table 8. The Fit Indices of the Need Satisfaction Perceived Online Scale

Goodness of Fit Values	Good Fit	Acceptable Level of Fit	Observed Values
X^2/sd	$0 \leq X^2/df \leq 2$	$2 < X^2/df \leq 3$	2,040**
X^2			99,942
sd			49
RMR	$0 \leq RMR \leq 0.05$	$0.05 < RMR \leq 0.10$.074**
GFI	$0.95 \leq GFI \leq 1.00$	$0.90 \leq GFI < 0.95$.946**
AGFI	$0.90 \leq AGFI \leq 1.00$	$0.85 \leq AGFI < 0.90$.914*
NFI	$0.95 \leq NFI \leq 1.00$	$0.90 \leq NFI < 0.95$.909**
CFI	$0.97 \leq CFI \leq 1.00$	$0.95 \leq CFI < 0.97$.950**
RMSEA	$0 \leq RMSEA \leq 0.05$	$0.05 < RMSEA \leq 0.08$.060**

N:289, * Good Fit, ** Acceptable Level of Fit

Figure 1. The Diagram of Standardized Coefficients of the Need Satisfaction Perceived Online Scale



When examining the fit indices in Table 8, the chi-square to degrees of freedom ratio ($X^2=99,942/sd=49$) was found to be close to a good fit and showed an acceptable level of fit (Hu & Bentler, 1999). The other fit indices were as follows: RMR (“the root mean square residual”) was .074; GFI (“the goodness of fit index”) was .946; AGFI (“the adjusted goodness of fit index”) was .914; CFI (“the comparative fit index”) was .950; NFI (“the normed fit index”) was .909; RMSEA (“the root mean square error of approximation”) was .060. When comparing these indices to good and acceptable fit reference values, the AGFI value showed a good fit, while the other indices, including RMR, NFI, CFI, and RMSEA, were found to have an acceptable fit (Baumgartner & Homburg, 1996; Browne & Cudeck, 1992; Byrne, 2001; Marsh, Hau, Artelt, Baumert & Peschar, 2006; Schermelleh-Engel, Moosbrugger & Müller, 2003).

When the standardized coefficients in Figure 1 were examined, it was seen that the relationship of the autonomy sub-scale with the observed variables had factor values of .33, .84, .85 and .46 respectively; the competence sub-scale had factor values of .73, .68, .63 and .55; and the relatedness sub-scale had factor values of .68, .71, .81 and .60. Path coefficients between latent variables and observed variables were found to be significant. The standardized coefficients between the latent variables were found to vary between .32 and .45. As a result, all items included in the model of the scale consisting of 12 items and three sub-scales showed fit with the model.

Based on the fit indices in Table 6 and the scale path diagram in Figure 1, it was concluded that CFA revealed that the scale was applicable with a three-factor structure.

The Reliability Study of Need Satisfaction Perceived Online Scale

The scale's reliability was evaluated using the internal consistency method. The Cronbach's Alpha values calculated for the sub-dimensions and the whole of the scale are shown in Table 9.

Table 9. The Reliability of Need Satisfaction Perceived Online Scale

Factors	Cronbach's Alfa Values
Online Autonomy	.70
Online Competence	.72
Online Relatedness	.77
Total	.80

N=346

When examining Table 6, we can observe that the Cronbach's Alpha coefficient for the online autonomy sub-dimension of the scale was .70, the Cronbach's Alpha coefficient for the online competence sub-dimension was .72, and the Cronbach's Alpha coefficient for the online relatedness sub-dimension was .77. For the whole scale, the Cronbach's Alpha coefficient was found as .80.

Discussion, Conclusion and Recommendations

The digital age we live in has made online environments accessible to almost everyone, and online communication has become an integral part of social relations. Online environments can provide individuals with the power to control their self-presentations, and satisfy their psychological needs in the related environments (Wong, Yuen & Li, 2015). Additionally, these environments offer a fast and accessible resource for satisfying the aforementioned needs. (Wan & Chiou, 2006). Evaluating the satisfaction of psychological needs in online environments has been considered very important (Wang et al., 2015) and various studies have been conducted on this subject (Hopp, 2015; Li, Shi & Dang, 2014; Orben, 2020; Shen, Liu & Wang, 2013; Wang et al., 2015; Wu, Qiao & Liu, 2022). However, no research on this subject has been found in Turkey and neither an adapted nor a developed scale on this subject has been found. Therefore, our study aims to contribute to this gap in the literature by developing a measurement tool for the satisfaction of psychological needs in online environments that can be used for further research.

In the study aimed at developing the Need Satisfaction Perceived Online Scale, an adaptation study was initially conducted, but a three-dimensional scale (competence, autonomy, and relatedness) based on the theoretical basis could not be achieved. Subsequently, scale development studies were initiated, and a pool of scale items was created through both literature review and interview methods. Firstly, the researchers applied the scale to a sample group of university students for EFA, and then the scale was finalized by conducting the relevant analysis. The final version of the scale was then

tested on a new sample group for CFA. After this entire process, the developed scale was found to be both valid and reliable. Given that current research is focused on online environments and conducting evaluations and examinations in this field, it is believed that this developed scale will serve as a valuable resource for studies in Turkey and will guide research exploring its relationship with different variables.

Competence, autonomy, and relatedness are the three dimensions of psychological needs addressed by self-determination theory (Deci & Ryan, 2000). These needs have been universally accepted and considered important for the healthy development of individuals (Chirkov et al., 2003; Ryan & Deci, 2000; Véronneau, Koestner & Abela, 2005). The sub-dimensions of the need satisfaction perceived online scale developed in our study were consistent with both this theoretical basis and the sub-dimensions in other scale studies in the literature (Shen, Liu & Wang, 2003; Standage, Duda & Ntoumanis, 2005; Wang et al., 2015). Consequently, a valid and reliable measurement tool was obtained that is in line with the theoretical basis and other adapted and developed scales.

In this study, a comprehensive approach was taken by first conducting a scale adaptation study, and then proceeding to a scale development study when the expected results were not achieved. Furthermore, the use of different samples for the scale adaptation study and for EFA and CFA in the scale development study strengthened the results of the study. However, it is necessary to test the scale on samples with different demographic characteristics to ensure generalizability. This measurement tool can be tested especially for adolescents who frequently communicate online, or a similar measurement tool can be developed for this group. Furthermore, the relationship between this developed scale and different variables can be examined in future studies.

The digital age has made online environments inevitable, allowing individuals to transfer their real social environments to the virtual world. Therefore, it is crucial to increase the number of studies in this area, to reveal the benefits and potential harms with the findings of scientific research, and to involve practitioners in the necessary prevention or intervention studies. Evaluating the satisfaction of perceived needs in online environments is also significant in this context, and it is hoped that this developed measurement tool will prove useful in field studies.

Declarations

Conflict of Interest: The researchers have stated that they do not have any possible conflicts of interest.

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