



## Examining the Relationships between the Problematic Internet Consumption and Internet Engagement Profiles of Young Adults\*

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### Abstract

Today, individuals frequently spend time on the internet for different purposes. However, differences in internet usage purposes also create differences between the internet engagement profile. It is known that some user profiles are exposed to possible negative outcomes of the internet. The aim of this research is to develop useful scales that can be used to determine individuals' problematic internet consumption and internet engagement profiles. The research group consists of 889 university students which participated in the research as volunteers from 54 different universities. EFA and CFA outputs were evaluated to examine the validity of the problematic internet consumption (PIC) and internet engagement profile (IEP) scales developed within the scope of the research. According to the percentage of variance accounted, the factors of the PIC are Dysfunctionality in Daily Life (23%), Loss of Control (18%), and Fear of Missing Out (10%), respectively. According to the percentage of variance accounted, the factors of the IEP are Passive Consumer (16%), Information Seeker (13%), Social User (12%), and Content Creator (11%), respectively. As a result of the study, it was determined that PIC score of individuals who were able to endure the lack of access to the internet for a shorter time were significantly higher. Besides, individuals who spend more time on the internet every day have significantly higher PIC score. The results obtained from the research were discussed within the scope of the literature and various suggestions were made.

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## INTRODUCTION

In a large-scale study on internet usage in the world by We Are Social (2021), it was seen that the average daily internet usage time of individuals increased compared to the pre-pandemic period, moving up to 6 hours and 43 minutes. In this process, it was seen that individuals frequently used the internet for purposes such as accessing to information, communicating with their friends or families, following daily news and investigating how things are done. Considering these purposes of use, it may be said that the pandemic affects individuals' internet usage activities. In the literature, there are different classifications for internet usage types such as social, entertainment, information, and commercial use (Zhu et al., 2020). Internet usage purposes of individuals shape the effects of the Internet on life (Montag et al., 2014). The use of the internet for purposes such as socializing, entertainment and playing games can be a risk factor for problematic internet consumption (Cao et al., 2011). Therefore, comprehensive research on individuals' internet use by including the variables of internet usage profile and problematic internet consumption will enable more explanatory information to be presented. In this study, two different measurement tools were developed to determine the problematic internet consumption and internet usage profiles of young adults and their validity and reliability studies were conducted.

In the research, the first measurement tool developed to determine the internet usage habits of young adults is the "Problem Internet Consumption Scale" (PIC). In recent years, increases in internet usage rates and internet consumption culture may led to various problems (Anand et al., 2018; Soldatova & Teslavskaja, 2017; Zheng et al., 2016). In the literature, this situation is expressed with different concepts such as internet addiction, problematic internet usage, pathological internet use or excessive internet use (Fernandes et al., 2019; Young & De Abreu, 2011). In this research, the concept of "problematic internet consumption" was used to express the use of the internet by individuals in a way that may create problems in their lives. The purpose of using this concept is since the use of the internet has become a necessity in recent years and the differentiation of their use for production and consumption purposes. Because some individuals have to use the internet today to fulfill their professional or academic responsibilities (Feindel, 2019). However, some individuals use the internet just only to spend time, and in this process, they can perform consumption-oriented activities such as following their social media posts, watching video-film-series, and following blogs (Yüceliyiğit & Aral, 2020). Therefore, it may be a necessity to consider the internet and internet approaches for consumption-oriented as a requirement of the age in the studies conducted on internet usage today. In this context, the notion of "problematic internet consumption" was included for the first time in this research and it was aimed to be supported by different studies to be carried out in the literature. Within this scope, problematic internet consumption can be defined as an individual's use of the internet mostly to spend time, having difficulties in controlling internet use, experiencing various emotional reactions when the person is not able to access to the internet, being mentally engaged with the internet activities when leaving the internet, and the negative effects of internet usage on the physical, psychological and social life spaces of the person (Block, 2008; Young, 2009).

The concept of problematic internet consumption is considered as a complex structure that includes a lot of different factors. Block (2008), as a result of his studies, stated that internet addiction is occurred by the combination of 4 different components: overuse, withdrawal, tolerance, and negative effects. While the notion of overuse among these components is considered as excessive and uncontrolled time spent on the internet, the notion of withdrawal refers to the fact that a person experiences emotions such as anger, unhappiness, and anxiety when he/she cannot perform internet activities. While Block (2008) considers the tolerance component as the increase in the use of the internet by the individual by the day, he defines the negative effects component as the negative impact of physical, psychological, and social life spaces as a consequence of the internet use by the individual. Griffiths (1998), another researcher who conducted studies on problematic internet use, stated that

internet addiction consists of 6 different components: salience, mood modification, tolerance, conflict, withdrawal, and relapse. While the salience from these components is considered as the internet's coming to an important position in terms of an individual's life, the mood modification component is defined as subjective experiences that a person experiences during or after internet use. The component of tolerance, on the other hand, refers to the increase in the internet usage of the individual as stated by Block (2008). While the conflict component defines the individuals' internet use to create conflicts in their relationships in daily life, the deprivation component includes behaviors similar to Block's (2008) concept of withdrawal. Finally, the relapse component refers to the fact that a person has problems again owing to various reasons after his/her internet use becomes healthy (Griffiths, 1998). Recent studies show that problematic internet consumption among university students is decidedly a common problem. The prevalence of problematic internet usage among Greek university students was 34.7% in the study conducted by Frangos et al. (2011), 38.2% in the study conducted by Kitazawa et al. (2018) with Greek university students, and the prevalence of internet consumption was found to be 8.4% in a study conducted by Balhara et al. (2019) with university students in seven different countries. These results show that problematic internet consumption is a common and universal problem among university students. Therefore, it may be important to focus on their problematic or healthy consumption of the internet while determining the internet usage habits of university students. Within this scope, the first of the measurement instruments in the research focuses on problematic internet consumption levels of university students. However, focusing only on problematic internet consumption of university students may be insufficient to explain internet use. For this reason, a measurement tool was developed to determine the internet engagement profiles of university students.

Another measurement instrument developed to determine the internet usage habits of university students is the "Internet Engagement Profile" (IEP) scale. Individuals can create different profiles according to the way they interact with internet. For example, some individuals use the internet to get more information, personal development, and participate in academic activities, while others use it to socialize, chat and meet new individual (Wang, 2010). Currently, some individuals, especially young individual, see the internet as a means of production and can support other individual to benefit from these contents with different types of content they produce (Mutlu & Bazarıcı, 2017). It is important to determine the purpose for which university students use the internet along with their problematic consumption of the internet to plan prevention/intervention studies to be conducted (Montag et al., 2010). Because the studies in the literature indicate that differences in the purpose of using the internet may create risks in varied ways in terms of problematic internet consumption (Asıcı, 2019). The studies imply that the use of the internet for sexual pleasure, gaming, spending time on social media platforms, watching movies/series, and entertainment may be a risk factor for problematic internet consumption (Cao et al., 2011; ElSalhy et al., 2019; Kormas et al., 2011; Vadher et al., 2019), while education, information and professional uses of it do not cause any risk (ElSalhy et al., 2019; Kormas et al., 2011; Yılmaz et al., 2014). So, while determining the internet usage habits of university students, it is believed that stating college students' profiles according to their internet usage patterns enable the measurement and evaluation services to be carried out more comprehensively. Besides, sanity professionals need to determine the internet usage profiles of students while planning the prevention/intervention studies to be conducted for students with internet addiction or problematic internet consumption (Akbulut, 2021). Because university students' problematic consumption of the internet to play a game and their problematic consumption to use social media are different situations and, in the studies, to be conducted with these pupils, it is necessary to concentrate on different components. In this context, it can be required to focus on the profiles of internet use when examining the internet usage habits of university students. Hence, another of the measurement instruments developed to determine the internet usage habits of college students focuses on the internet usage profile.

In the literature of our country, there are various measurement instruments used to examine the internet usage behaviors of college students (Kabadayı, 2020). When these measurement instruments were examined, it was found that these were the tools only to determine university students' internet addiction (Çakır-Balta & Horzum, 2008; Kesici & Şahin, 2010; Kutlu et al., 2016), problematic internet use (Deniz & Tutgun-Ünal, 2016; Gökteş et al., 2018), or purposes of the internet usage (Akar, 2017; Karal & Kokoç, 2010; Usluel et al., 2014). Apart from these measurement tools, there are some measurement instruments aimed at measuring the internet usage habits of university students.

When the measurement instrument developed by Özeren and Akpınar (2016) to measure the internet usage habits of college students was examined, it was observed that the instrument was not a very comprehensive measurement tool. Because the measurement tool consists of one dimension and there are 10 items related to internet usage activities. Internet usage habits of university students include more than one factor, and therefore the measurement instruments that will measure this structure must be comprehensive. In another measurement instrument developed by Küçükvardar (2020) on this subject, a measurement tool was developed to examine the technology usage habits of technology users. However, when the preparation process and dimensions of the measurement tool were examined, it was seen that it was a measurement instrument that could measure the structure of problematic technology use rather than the habits of technology use.

When all these are considered, it is regarded that developing comprehensive measurement instruments to determine the internet usage habits of university students can contribute to the literature, researchers, and experts working on this issue. Besides, the lack of extended measurement instruments to determine the internet usage habits of university students in our country increases the contribution of the measurement tools to be developed in this study to the literature. Thus, within the scope of the research, it is aimed to develop two measurement tools to determine the internet usage habits of university students and to bring them into Turkish literature:

1. Is the "Problematic Internet Consumption Scale" developed to measure the problematic internet consumption levels of young adults, a valid and reliable scale?
2. Is the "Internet Engagements Profiles Scale" developed to measure internet engagements profiles of young adults a valid and reliable scale?
3. What kind of a relationship is there between the levels of problematic internet consumption and internet usage profiles of young adults?

## **METHOD**

This study is applied research because it involves scale development processes to measure latent traits. The quantitative data were analyzed to obtain evidence of the validity of the study. Thus, this study is a cross-sectional design, a correlational method, and a quantitative study.

### **STUDY GROUP**

The research group consists of 889 university students (82% female) reached by convenience sampling from 54 different universities. In addition, a think-aloud session was conducted with eight university students to assess the suitability of the items. The mean age of the study group was 21.9 and the standard deviation was 3.7. Students in the study group stated that they use smartphones (89%) and computers (10%) to connect to the internet. The distribution of the participants according to their daily internet use is less than 2 hours (6.3%), 2-4 hours (28.5%), 4-6 hours (36.7%), 6-8 hours (19.5%), more than 8 hours (9.1%). It is known that the OECD average for daily internet usage is 4.37 hours (OECD, 2022). Accordingly, it may be said that 65% of the study group has internet use above the average.

### **ETHICAL STATEMENT**

The measurement tools used in the research were approved by the Ethics Committee for Social Science and Humanities of Kırşehir Ahi Evran University (Decision No: 2021/5/8).

### **THE PROCESS OF SCALE DEVELOPMENT**

The PIC was developed to measure the negative effects of individuals' internet consumption habits on an individual's life. While preparing the scale, it was focused on the cognitive, affective, and behavioral outputs that university students who have high internet consumption might encounter. The first draft of the PIC scale was prepared of 25 items gathered under three themes: Loss of Control (LOC), Fear of Missing Out (FOMO), Dysfunction in Daily Life (DDL) (see Appendix C).

The IEP was developed to measure individuals' internet engagement profiles and to determine their dominant profiles. Just as the scale was being prepared, observations of the researchers and the aims of connecting to the internet of the young adult age group and the actions they often performed on the internet were focused. The first draft of the IEP scale was composed of 15 items gathered under five different themes: Passive Consumer (PC), Information Seeker (IS), Social User (SU), Content Creator (CC) (see Appendix C).

The draft forms were examined formally, semantically and psychometrically by five psychometry domain experts. Additionally, a think-aloud session was held with university students to evaluate the suitability of the items for the target group. Trial forms were created after the revision, which was carried out taking into account the feedback.

### **DATA ANALYSIS**

Psych (2.1.6), lavaan (0.6-9), semPlot (1.1.2), semTools (0.5-5), MVN (5.9) packages in R environment were used for data analysis. The outliers ( $f=22$ ) determined by the Mahalanobis distance method dropped from the data. The data were randomly divided to be used for %40 (NEFA=346) EFA, %60 (NCFA=521) CFA analysis.

EFA data set consisting of 346 observations was used in exploratory factor analysis studies. EFA, Principal Axis Method, and Varimax Orthogonal Rotation Technique were applied for the factor analysis. PA (Parallel Analysis) was taken into account to determine the number of factors in the scale since it gave more consistent results (Zwick & Velicer, 1986; Koçak et al., 2016). To obtain a consistent factor structure, items with low factor loading and items with cross-loading problems were excluded from the scale (Tabachnick & Fidell, 2001). CFA data set which contains 521 observations was used to examine the goodness of fit of factor structures generated after EFA. The DWLS method was preferred since it produced less biased results in factor loadings and parameter estimations since the multivariate normality of data did not meet the assumption of normality (Li, 2016).

The obtained model goodness of fit values,  $\chi^2/df$ , RMSEA, SRMR, TLI, CFI values, were interpreted by assuming the cut-off values accepted in the literature (Hu & Bentler, 1999). In addition, the evidence of construct validity was gained by the known-groups method using the questions in the information survey for the PIC scale. In the known-groups method, One-Way ANOVA analysis was used since the assumptions required for the analysis of variance were met. Kendall's  $\tau_b$  correlation coefficient was calculated for the hypothesis in which the relationship between ordinal and continuous variables was studied. Cronbach Alpha ( $\alpha$ ) and McDonald's Omega ( $\omega$ ) reliability coefficients were attained to determine the reliability level of the scales. Interfactor and interscale correlation coefficients on account of the developed PIC and IEP scales were examined.

### **RESULTS**

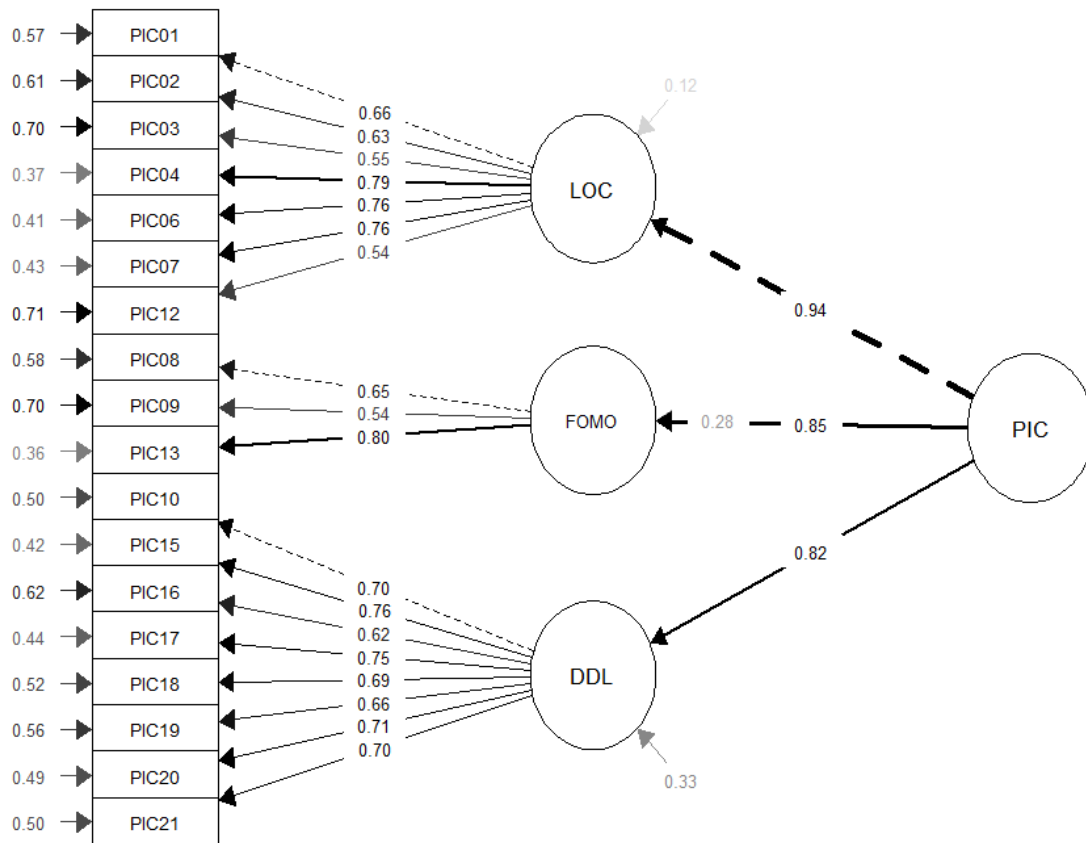
Firstly, the number of factors was determined using parallel analysis. Parallel analysis results showed that three-factor and four-factor structures are appropriate for the PIC and IEP scales,

respectively. Factor analyzes were carried out considering the results of parallel analysis. The results of the initial factor analysis performed showed that the sample size was sufficient ( $KMO_{PIC}=.90$ ,  $KMO_{IEP}=.79$ ) and the sphericity test was significant ( $p<.05$ ) for both scales. Since the sample adequacy was sufficient and the sphericity assumption was met, the EFA analysis was performed. For the initial EFA results, the items with low factor loading ( $<.32$ ) and cross loading (the difference  $<.10$  in loading values in adjacent factors) were excluded from the scale, and the analyzes were repeated. Due to the stated problems, three items (PIC05, PIC11, and PIC14) from the PIC scale and two items from the EIP scale (EIP13, EIP14) were dropped in the EFA analysis. As a result of repeated factor analyzes, consistent factor structure was obtained for both the PIC scale (18 items under three-factor) and the IEP scale (13 items under four-factor).

**VALIDITY AND RELIABILITY OF THE PIC SCALE**

The PIC factors were conceptualized as Dysfunctionality in Daily Life (DDL), Loss of Control (LOC), and Fear of Missing Out (FOMO). According to the percentage of variance accounted, the most important factor is DDL (23%), LOC (18%) and FOMO (10%), respectively. The PIC scale accounted for 51% of the total variance. The principal axis factoring results indicated that the PIC scale, which consists of 18 items gathered under 3 factors, has a good fit ( $\chi=342.89$ ,  $df=102$ ,  $\chi^2/df=3.3$ ,  $SRMR=.04$ ,  $RMSEA=.05$ ,  $TLI=.87$ ). The matrix of standardized factor loadings by varimax rotation for the PIC scale is provided in Appendix A. In order to test the validity of the EFA results, CFA analysis was performed for the PIC scale. The unidimensionality of the PIC scale was evaluated by using the adjacent factor eigenvalue ratio to define the CFA model. The fact that the eigenvalue ratio of adjacent factors is higher than four indicates a unidimensional construct (Slocum-Gori & Zumbo, 2011). Since the eigenvalue ratio ( $\lambda_1/\lambda_2=4.2$ ) indicates unidimensionality, the construct validity of the PIC scale was examined with the second-order CFA model (Figure 1).

**Figure 1. Second-order CFA Path Diagram for the PIC Scale**



When examining the path diagram given in Fig 1., the factor loadings for the LOC factor indicator variables range between .54-.79, for FOMO .54-.80, and DDL .62-.72. Goodness-of-fit values of  $\chi^2/df=1.93$ , RMSEA =.042, SRMR=.054, TLI=.989, CFI=.991 were obtained for the PIC scale second-order CFA model. The resulting values point that the goodness-of-fit model is excellent compared to the cut-off values in the literature (Hu & Bentler, 1999). When EFA and CFA results were examined, it was found out that the construct validity of the PIC scale was high.

Cronbach Alpha ( $\alpha$ ) and McDonald’s Omega ( $\omega$ ) reliability coefficients were calculated to examine the reliability of the PIC scale. The reliability of the PIC scale ( $\alpha_{PIC}=.92$ ,  $\omega_{PIC}=.90$ ) and its factors was seen to be high. It was determined that the reliability of the FOMO ( $\alpha_{FOMO}=.70$ ,  $\omega_{FOMO}=.70$ ) factor was relatively low, but within acceptable limits when the DDL ( $\alpha_{DDL}=.70$ ,  $\omega_{DDL}=.70$ ) and LOC ( $\alpha_{LOC}=.70$ ,  $\omega_{LOC}=.70$ ) factors were compared.

The construct validity of the known-groups was examined using the questions in the information survey to gain additional evidence regarding the construct validity of the PIC scale. The questions, answer categories and hypotheses included to test the construct validity were given in Table 1.

**Table 1.** Hypotheses for the Known-Groups Validity of the PIC Scores

Question	Groups	Hypothesis
How long does it take for you to feel uneasy if you have no access to the internet?	1h later, 3h later, 6h later, 12h later, 24h later, 48h later	H <sub>1</sub> : Individual who can endure the lack of internet access for a shorter time have significantly higher PIC scores
How much time do you spend on the internet in a day?	<2h, 2h-4h ,4h-6h ,6h-8h, >8h	H <sub>2</sub> : Individual who spend more time on the internet daily have significantly higher PIC scores

The boxplot graph for the distribution of PIC scores according to the duration of individual enduring the lack of internet access was presented in Fig 2.

**Figure 2.** PIC Scores by the Duration of Enduring the Lack of Internet Access Boxplot

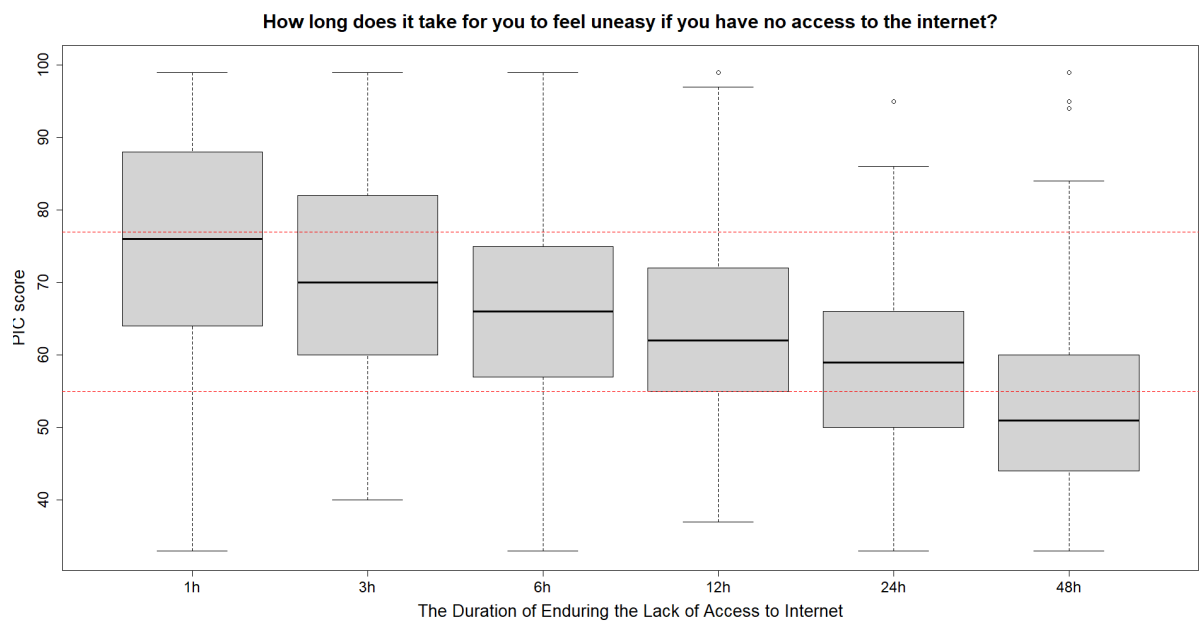


Fig 2 shows that individual who can endure the lack of internet access for less time have descriptively higher PIC scores. One-Way ANOVA results performed to test H1 hypothesis and to examine the significance of intergroup differences were found to be significant ( $F(5,350)=35.5$   $p<.05$ ).

The mean differences in PIC scores of intergroup and the Tukey post-hoc test results were presented in Table 2.

**Table 2.** PIC scores Tukey Post-hoc Results for the Duration of Enduring the Lack of Access to the Internet

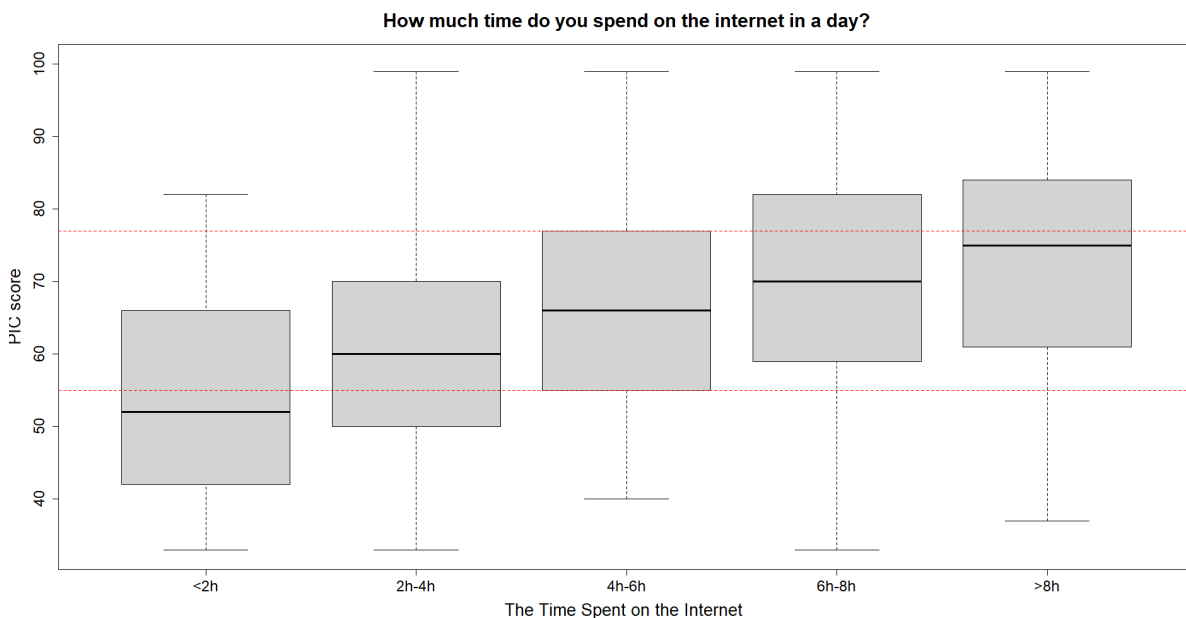
Time	1h	3h	6h	12h	24h	48h
1h	—	4.43	8.62*	11.73*	16.30*	21.01*
3h		—	4.19*	7.30*	11.87*	16.59*
6h			—	3.11	7.68*	12.39*
12h				—	4.57	9.29*
24h					—	4.72
48h						—

\* p<.05

In Table 2, the highest difference between PIC scores is between the group that can withstand no internet for 1 hour and the group that can endure no internet for 48 hours. Even though there is no statistically significant difference between adjacent groups, PIC scores decrease significantly as linearly the duration of enduring non-internet increases. The results showed that H1 hypothesis could not be rejected.

The boxplot graph of the distribution of PIC scores according to the time spent on the internet by individuals was given in Fig 3.

**Figure 3.** PIC Scores by the Time Spent on the Internet Boxplot



In Fig 3, it was seen that individual who spend longer time on the internet descriptively have higher PIC scores. The One-Way ANOVA results performed to test H2 hypothesis and to examine the significance of intergroup differences were found to be significant ( $F(4,233)=26.2$   $p<.05$ ). The mean differences in PIC scores of intergroup and the Tukey post-hoc test results were given in Table 3.



**Table 3.** *Personal Characteristics of Teachers*

<i>Time</i>	<i>&lt;2h</i>	<i>2h-4h</i>	<i>4h-6h</i>	<i>6h-8h</i>	<i>&gt;8h</i>
<i>&lt;2h</i>	—	-7.58*	-13.19*	-16.44*	-19.89*
<i>2h-4h</i>		—	-5.61*	-8.87*	-12.32*
<i>4h-6h</i>			—	-3.26	-6.71*
<i>6h-8h</i>				—	-3.45
<i>&gt;8h</i>					—

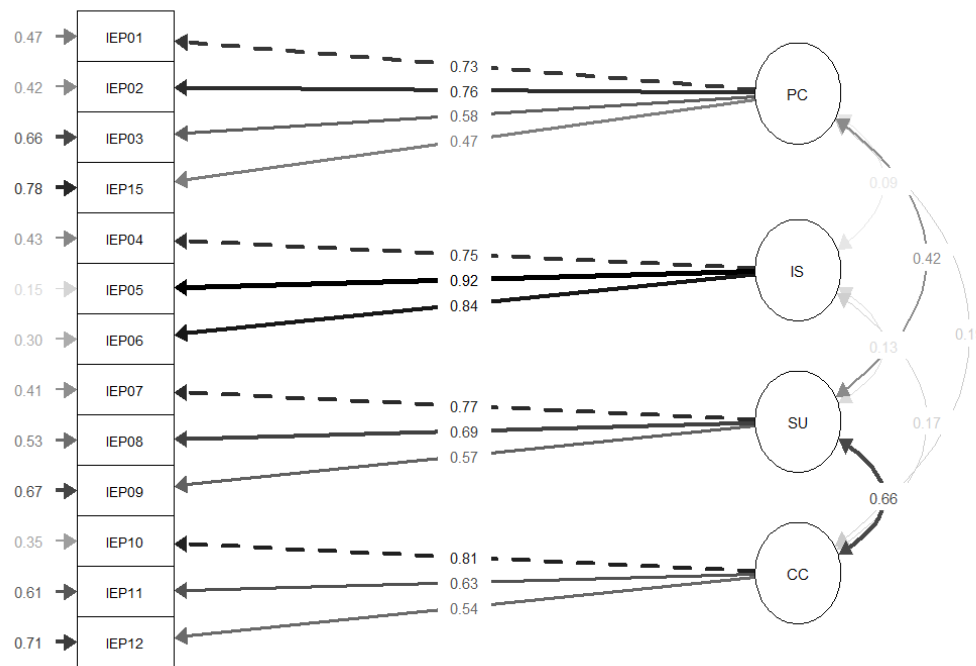
When Table 3 was examined, the highest difference between PIC scores was found between the group that spent less than 2 hours on the internet and the group that spent more than 8 hours on the internet. A statistically significant difference was found among all groups, excluding two adjacent groups. Individual who spend time more than 8 hours on the internet have significantly higher PIC scores compared to all groups (except 6h-8h). It was come out that PIC scores also increased significantly as the time spent on the internet daily increased. The results showed that H2 hypothesis could not be rejected.

Within the scope of the research, the individuals were also asked, “Do you think the quality of your life is affected by your internet usage habits negatively?”. Students were asked to rate the negative impact they felt due to their internet usage habits on a scale of 1-4. The relationship between the level of negative effects that individuals feel owing to internet usage and their PIC scores was examined by Kendall’s  $\tau_b$  correlation coefficient. It was determined that there was a significant moderate correlation (Kendall’s  $\tau_b=.36$   $p<.05$ ) between the level of negative effects felt by the students and their PIC scores. Findings support that the construct validity of the PIC scale is high.

**VALIDITY AND RELIABILITY OF THE IEP SCALE**

The IEP factors were conceptualized as Passive Consumer (PC), Information Seeker (IS), Social User (SU), Content Creator (CC). According to the percentage of variance accounted, the most important factor is PC (16%), IS (13%), SU (12%), and CC (11%), respectively. The IEP scale accounted for 52% of the total variance. The principal axis factoring results indicated that the EIP scale, which consists of 13 items gathered under four factors, has a good fit ( $\chi=79.2$ ,  $df=32$ ,  $\chi^2/df=2.5$ , SRMR=.03, RMSEA=.05, TLI=.91). The matrix of standardized factor loadings by varimax rotation for the EIP scale is provided in Appendix B. In order to test the validity of the EFA results, CFA analysis was performed for the IEP scale. The unidimensionality of the IEP scale was evaluated by using the adjacent factor eigenvalue ratio to define the CFA model. Since the eigenvalue ratio ( $\lambda_1/\lambda_2=1.7$ ), the construct validity of the IEP scale was examined with the first-order CFA model (Fig 4).

**Figure 4.** First-order CFA Path Diagram for the IEP Scale



When the path diagram presented in Fig 4 was examined, factor loadings for indicator variables vary between .47-.76 for PC, .75-.92 for IS, .57-.77 for SC, and .54-.81 for CC.  $\chi^2/df=2.86$ , RMSEA =.060, SRMR=.064, TLI=.930, CFI=.947 goodness-of-fit values were obtained for the IEP scale first-order CFA model. The resulting values indicate that the model’s goodness-of-fit is excellent compared to the cut-off values in the literature (Hu & Bentler, 1999). When EFA and CFA results were examined, it was found out that the construct validity of the PIC scale was high.

Cronbach Alpha ( $\alpha$ ) and McDonald’s Omega ( $\omega$ ) reliability coefficients were calculated to examine the reliability of the IEP factors. According to the levels of reliability, the IEP factors are IS ( $\alpha_{IS}=.87$ ,  $\omega_{IS}=.88$ ), PC ( $\alpha_{PC}=.73$ ,  $\omega_{PC}=.74$ ), SU ( $\alpha_{SU}=.71$ ,  $\omega_{SU}=.72$ ), and CC ( $\alpha_{CC}=.70$ ,  $\omega_{CC}=.70$ ) respectively.

Using the data of 867 participants who participated in the research, the interfactor and interscale correlation coefficients for PIC and IEP scales were calculated. The correlation coefficients for PIC and IEP were given in the correlation matrix in Table 4.

**Table 4.** Correlation Matrix for PIC and IEP

SCALE	PIC <sup>a</sup>				IEP <sup>b</sup>				
	PIC.SCALE	LOC	FOMO	DDL	PC	IS	SU	CC	
PIC <sup>a</sup>	1.00	.89*	.73*	.91*	.50*	-.07	.23*	.09*	
LOC		1.00	.60*	.66*	.57*	-.01	.19*	.06	
FOMO			1.00	.50*	.41*	-.01	.27*	.19*	
DDL				1.00	.33*	-.13*	.18*	.06	
IEP <sup>b</sup>					1.00	.14*	.29*	.11*	
PC						1.00	.15*	.16*	
IS							1.00	.46*	
SU								1.00	
CC									1.00

a PIC: Problematic Internet Consumption; LOC: Loss of Control, FOMO: (Fear of Missing Out), DDL: (Dysfunction in Daily Life)

b IEP: Internet Engagement Profile; PC: Passive Consumer, IS: Information Seeker, SU: Social User, CC: Content Creator

\* p<.05

When analyzed for PIC, it was observed that there was a strong (high degree of) a significant correlation between LOC, FOMO, DDL factors, and scale scores. When PIC factor-factor correlations were examined, a moderate degree of significant correlations was observed ranging from .50 to .66. The resulting correlations support the convergent validity of the scale. When Analyzed for IEP, correlations ranging from .14 to .46 were observed between PC, IS, SU, and CC factors. Low significant correlations obtained for the IEP scale, which will be used to determine different internet user profiles, support the divergent validity of the scale.

The highest correlation ( $r_{(LOC-PC)}=.57$ ) was found between the PIC\_LOC factor and IEP\_PC factor when analyzing the correlations between PIC and IEP in Table 4. This correlation between the factors of two scales indicated that co-variance between passive consumption and the factors of losing control in problematic internet consumption was strong. One of the noteworthy findings was that there was no correlation between the IEP\_IS factor and the PIC scale and its factors (except PIC\_DDL). While low significant correlations were observed between the IEP\_SU factor and PIC scale and its factors, PIC\_FOMO was the only factor associated with the IEP\_CC factor.

## DISCUSSION, CONCLUSION AND IMPLICATIONS

Even though it varies from country to country, the rate of household internet access has increased from 66.6% to 91.2% in the last 10 years (OECD, 2022). The situation is not different when examined in Turkey. 9 out of 10 households (90.7%) have internet access in Turkey (OECD, 2022). In addition to increasing the prevalence of internet use, the density of internet usage is increasing, as well. Many actions fulfilled in the physical environment, especially shopping, socialization, learning, are currently performed in the digital environment and through the internet. The average internet usage of 4.3 hours every day demonstrates the importance of the internet for today's people. All these statistics prove how important the internet is to many people.

In case of excessive and uneven internet consumption, a person will inevitably experience various problems with regards to physical (Zheng et al., 2016), mental, and psychological (Longstreet et al., 2019). So much that the research focusing on internet usage habits has led to the emergence of the cyber psychology department (Norman, 2017). Psychometric measurement instruments are required for studies that examine individual-internet interaction and its consequences. The developed psychometric tools enable the planning of preventive programs to prevent the problems caused by the internet (Asıcı, 2019). Therefore, this research was focused on the development of psychometric tools in which people's internet usage profiles and problematic internet consumption levels can be evaluated. All in all, PIC and IEP scales determined to be high in validity and reliability were developed.

As a result of the exploratory factor analysis of the PIC measurement instrument developed within the scope of the research, it was discovered that it has a three-factor structure: PIC\_DDL (Dysfunction in Daily Life), PIC\_LOC (Loss of Control), and PIC\_FOMO (Fear of Missing Out). PIC\_DDL factor is the most important factor in problematic internet consumption with its reported variance rate of 23%. Individuals with problematic internet consumption are known to experience difficulties in fulfilling their responsibilities in daily life (Block, 2008). PIC\_DDL factor shows similarities in terms of item content with the dimensions of "negative consequences of the internet" in Problematic Internet Use (Ceyhan et al., 2007) and "Dysfunction" in Internet Addiction Scale (Günüç & Kayri, 2010). Cao et al. (2020) has emphasized users' attachment to social media can positively give rise to addictive behavior which brings negative outcomes for users. PIC\_LOC factor, which accounts for 17.9% of the total variance, is the second substantial factor of the PIC scale. It is known that an individual's inability to control the content and time they consume on the internet is a sign of problematic internet consumption (Young & De Abreu, 2011). One of the unique aspects of the PIC scale structure is the PIC\_FOMO factor. In the literature, the fear of missing out factor is not measured in the scales that measure problematic internet usage. The concept of fear of missing out can be defined as individual

experiencing anxiety when they stay away from activities on the internet and are afraid to miss out on developments on the internet (Block, 2008). In the literature, instruments that measure only FOMO have also been developed (Gökler et al., 2016). Assuming that it is an indicator of problematic internet consumption, it is considered important to find the PIC\_FOMO factor in the PIC scale structure. Along with all the factors, the total variance reported by the PIC scale is 51.4%. Although the PIC scale differs from similar scales in terms of structure, it was determined to report higher variance with fewer items when compared to scales in the literature (Ceyhan et al., 2007; Günüş & Kayri, 2010). A small number of items provides economy/facilities in the data collection process.

A four-factor structure was generated as IEP\_PC (Passive Consumer), IEP\_IS (Information Seeker), IEP\_SU (Social User), IEP\_CC (Content Creator) in consequence of the exploratory factor analysis performed for the IEP scale. The variances explained by the factors of IEP\_PC, IEP\_IS, IEP\_SU, IEP\_CC are 15.9%, 12.6%, 12.5%, 10.7%, respectively. IEP scale is quite different in the way of structure from the PIC scale. The inter-factor correlations range from .11 to .46. There is no total score for IEP. The dominant profile of the person is determined by calculating IEP factor scores. In the IEP\_PC factor, the frequency of passive actions that do not require interaction, such as viewing, watching, and following, is measured in the daily internet consumption. Studies show that individual who use the internet for consumption or social purposes such as entertainment, socialization, and watching videos/movies are at risk for problematic internet usage/internet addiction (Kormas et al., 2011; Vadher et al., 2019). Finding a significant correlation at the level of .50 between the IEP\_PC factor scale and the PIC scale score overlaps with the results in the literature. Another factor is the IEP\_SU factor. IEP\_SU factor measures the frequency of daily internet usage of interactive actions based on socialization, such as liking, commenting, and chatting.

In the literature, studies are indicating the correlation between social media addiction and problematic internet use (Ayğar & Uzun, 2018). A significant correlation at the level of .23 found between the IEP\_SU factor and PIC\_ scale score is in line with the findings in the literature. Another factor that differs from IEP\_PC and IEP\_SU and is considered important is the IEP\_IS factor. In the IEP\_IS factor, the frequency of daily internet use of actions performed to conduct research and access to information on any topic is measured. Studies in the literature imply that individuals who use the internet for information searching, research, and educational purposes do not carry a risk in terms of problematic internet use (ElSalhy et al., 2019; Kormas et al., 2011). Finding a weak level of -.07 significant negative correlation between IEP\_IS and PIC scale scores in the research supports the results in the literature. One of the substantial and authentic factors of IEP is the IEP\_CC factor. Currently, the case of creating content on the internet and earning from it has become widespread and it is observed that the number of individual using the internet for this purpose has increased (Yücelyiğit & Aral, 2020). IEP\_CC factor, developed in this context, measures the frequency of daily internet usage of actions taken to actively create and share content about anything on the internet. With its four-factor structure, the total variance explained by IEP is 51.8%.

Results supporting the construct validity were obtained with the hypothesis tests carried through using the known-groups method of PIC. As a result of the study, it was determined that PIC scores of individual who were able to endure the lack of access to the internet for a shorter time were significantly higher. The concept of lack/deprivation, which expresses feeling such as anxiety and anger that a person experiences when he/she is away from internet activities, has an important role in explaining problematic internet consumption (Block, 2008; Young, 2011). Besides, individual who spend more time on the internet every day have significantly higher PIC scores. Although excessive time spent on the internet is not enough alone to explain problematic internet consumption, it appears as a factor that cannot be ignored (Feindel, 2019). The studies show that the risk of problematic internet consumption also increases with the increase in the duration of internet use (Milani et al., 2009). In the post-hypothesis test conducted to support the construct validity of the PIC measurement instrument, a positive and significant correlation was found between the levels of negative impacts of

university students who participated in the study because of their internet use and their problematic internet consumption levels. The fact that internet usage harms an individual's daily life is one of the factors that explain problematic internet consumption (Block, 2008).

#### IMPLICATIONS FOR COUNSELING RESEARCH AND PRACTICE

In the consequence of the research, it was stated that PIC and IEP measurement tools are valid and reliable measurement instruments that can be used to determine the internet usage habits of university students. It is believed that the use of PIC and IEP scales will be useful in studies on problematic internet usage or consumption for young adult groups. In future studies, it is recommended to examine it in detail with correlation, regression, SEM, etc. analyses by using the tools measuring similar features in the literature together with PIC and IEP scales. With the widespread internet use, it is thought that problematic internet consumption tendency may occur for individuals at every education level. For this reason, it is anticipated that it will be beneficial to examine the construct validity of PIC and IEP scales on groups involving students at primary and secondary levels and bring them into the literature. It was evaluated that it would be useful to use PIC and IEP tools in screening studies to prevent the possible negative impacts of internet addiction as a behavioral addiction, especially within the scope of school psychological counseling and guidance activities. In addition to the PIC and IEP scales, it is recommended that the mediation effect be examined using structural models that incorporate background variables such as digital parenting, family communication, and well-being.

#### LIMITATIONS

This study was conducted with young adult college students aged 18-30 years. Therefore, generalization of the results to other age groups is limited. It is recommended that the validity and reliability of the measurements be verified before they are used in other age groups.

#### AUTHOR CONTRIBUTION

Author 1: Theoretical framework, methodology, data collection, data analysis, discussion, and writing original draft.

Author 2: Literature review, theoretical framework, data collection, discussion, and writing original draft.

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**APPENDIX A**

> Factor Analysis using method = pa  
 > Call: fa(r = PICdata[, -excluded.item], nfactors = 3, rotate = "varimax", fm = "pa")  
 > Standardized loadings (pattern matrix) based upon correlation matrix

Item	PA1	PA2	PA3	h2	u2
PIC01	<b>0.61</b>	0.21	0.18	0.45	0.55
PIC02	<b>0.67</b>	0.22	0.12	0.51	0.49
PIC03	<b>0.56</b>	0.11	0.18	0.36	0.64
PIC04	<b>0.62</b>	0.16	0.44	0.60	0.40
PIC06	<b>0.55</b>	0.31	0.39	0.56	0.44
PIC07	<b>0.53</b>	0.29	0.40	0.52	0.48
PIC12	<b>0.46</b>	0.35	0.15	0.36	0.64
PIC08	0.25	<b>0.66</b>	0.15	0.52	0.48
PIC09	0.15	<b>0.68</b>	0.04	0.49	0.51
PIC13	0.36	<b>0.55</b>	0.37	0.57	0.43
PIC10	0.25	0.35	<b>0.53</b>	0.46	0.54
PIC15	0.36	0.11	<b>0.66</b>	0.58	0.42
PIC16	0.33	0.08	<b>0.44</b>	0.32	0.68
PIC17	0.49	0.06	<b>0.62</b>	0.63	0.37
PIC18	0.26	0.13	<b>0.67</b>	0.53	0.47
PIC19	0.18	0.12	<b>0.74</b>	0.60	0.40
PIC20	0.12	0.07	<b>0.75</b>	0.57	0.43
PIC21	0.11	0.19	<b>0.75</b>	0.61	0.39

PA1: Loss of Control (LOC), PA2: Fear of Missing Out (FOMO), PA3: Dysfunctionality in Daily Life (DDL)  
 Dropped items: PIC05, PIC11, PIC14

**APPENDIX B**

> Factor Analysis using method = pa  
 > Call: fa(r = EIPdata[, -excluded.item], nfactors = 4, rotate = "varimax", fm = "pa")  
 > Standardized loadings (pattern matrix) based upon correlation matrix

Item	PA1	PA2	PA3	PA4	h2	u2
EIP01	<b>0.62</b>	0.10	0.15	0.09	0.43	0.57
EIP02	<b>0.71</b>	0.03	0.03	0.04	0.51	0.49
EIP03	<b>0.65</b>	0.04	0.08	-0.03	0.42	0.58
EIP13	<b>0.42</b>	0.16	0.11	-0.03	0.21	0.79
EIP04	0.16	<b>0.75</b>	0.08	0.10	0.60	0.40
EIP05	0.08	<b>0.91</b>	0.09	0.09	0.86	0.14
EIP06	0.10	<b>0.75</b>	0.06	0.08	0.58	0.42
EIP07	0.12	0.16	<b>0.67</b>	0.27	0.56	0.44
EIP08	0.04	-0.03	<b>0.76</b>	0.23	0.63	0.37
EIP09	0.22	0.13	<b>0.57</b>	0.07	0.39	0.61
EIP10	0.22	-0.03	0.39	<b>0.52</b>	0.47	0.53
EIP11	0.02	0.17	0.15	<b>0.70</b>	0.55	0.45
EIP12	-0.09	0.08	0.17	<b>0.69</b>	0.52	0.48

PA1: Passive Consumer (PC), PA2: Information Seeker (IS), PA3: Social User (SU), PA4: Content Creator (CC)  
 Dropped items: EIP13, EIP14

**APPENDIX C**

**The Problematic Internet Consumption (PIC) Sample Items**

Factors	Items
Loss of Control	Although I have no purposes, I find myself addicted to the internet
Loss of Control	I don't understand how time passes when I connect to the internet
Dysfunction in Daily Life	I get less sleep due to my internet usage
Dysfunction in Daily Life	My performance in my educational life (lecture grades, assignments, etc.) is affected negatively by my internet use
Fear of Missing Out	I think I am missing something out when I'm not online
Fear of Missing Out	I am curious about the developments in my accounts when I am not online

**The Internet Engagement Profile (IEP) Sample Items**

Factors	Items
Passive Consumer	Surfing on the explore pages of social media applications
Passive Consumer	Surfing on the net without any specific purpose
Information Seeker	Searching to get information on a subject
Information Seeker	Searching on the internet for research about a subject and reviewing the sources
Social User	Liking their posts to improve your relationships with individual
Social User	Messaging, chatting to improve your relationships with individual
Content Creator	Sharing something to express yourself (story, post, mood, tweet, forum, dictionary, etc.)
Content Creator	Creating and sharing authentic content (video, visual, writing, etc.) for individual to get the benefit