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Ekrem Sedat Şahin & Vildan Özdemir

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Ekrem Sedat ŞAHİN*
Vildan ÖZDEMİR**

*Ekrem Sedat ŞAHİN, Aksaray University, Department of Guidance and Psychological Counseling, Aksaray/Turkey.
E-mail: ekremsedat33@gmail.com
ORCID ID: 0000-0002-2499-1617
Phone Number: 0090 505 267 89 98
Corresponding author**
**Vildan ÖZDEMİR, Necmettin Erbakan University, Department of Measurement and Evaluation in Education, Konya/Turkey.
E-mail: vildan.ozdemir@erbakan.edu.tr
ORCID ID: 0000- 0002-9051-8860
Phone Number: 0090 507 810 13 99

Examining the Relationship Between Quest for Significance and Smartphone Addiction: Does the Dualistic Passion Model Mediate This Relationship?

Abstract

Background

In Turkey, smartphone use exceeds both European and global averages, posing potential risks to individuals' physical, social, and psychological well-being. The present research aimed to examine the relationships among smartphone addiction, significance quest, and passion, as well as to identify the mediating role of passion in the relationship between significance quest and smartphone addiction. In this regard, since there was no instrument available to assess passion within the Turkish cultural context, Study 1 adapted the Passion Scale for use in Turkish culture. Study 2 then investigated the associations among smartphone addiction, significance quest, and passion.

Methods

During the adaptation process of the Passion Scale, SPSS 25.0 was used for the exploratory factor analysis (EFA), and Mplus 7 was employed for the confirmatory factor analysis (CFA). In Study 1, the measurement invariance of the Turkish version of the scale was also examined across groups formed according to gender, age and types of activities performed with passion. The sample sizes for EFA and CFA are 270 and 289, respectively. Majority of participants in both groups are aged between 19 and 25 (EFA: 71.2%; CFA: 66.1%). In Study 2, after testing multivariate statistical assumptions, the SEM-based mediation model was tested using Mplus 7. The study group of Study 2 consisted of 674 individuals from different ages (22.6% of participants were adolescents aged 15-18; 57.1% of participanst aged 19-25; 20.3% of participants aged 26-35).

Results

The findings of Study 1 demonstrated that the two-factor structure of the Passion Scale was confirmed within the Turkish cultural context and that the scale exhibited high reliability. In Study 2, positive and significant relationships were identified between significance quest and smartphone addiction, between significance quest and obsessive passion, and between obsessive passion and smartphone addiction. Moreover, obsessive passion was found to mediate the relationship between significance quest and smartphone addiction. In contrast, no significant associations were observed between significance quest and harmonic passion, nor between harmonic passion and smartphone addiction.

Conclusions

The results of the study suggest that obsessive passion is one of the factors that strengthens the relationship between the significance quest and smartphone addiction. When an individual with obsessive passion experiences a loss of significance, their usage process may progress toward smartphone addiction, even if they are not yet addicted.

Keywords

Factor analysis, Reliability, Motivation, Emotions, Addictive behavior, Statistical model

Introduction

Smartphone use has increased significantly over the past decade (Kim et al., 2023; Yogesh et al., 2024). According to the We are Social report (2023), a total of 5.44 billion people worldwide use mobile phones. This represents 68 per cent of the world's population. The number of unique mobile users has increased by just over 3 per cent since last year. According to the same report, there are 81.68 million mobile connections in Turkey. This represents 95.4% of the total population. DataReportal (2024) reported that the average daily smartphone use in Turkey is 4.1 hours. Based on these data, it can be inferred that individuals in Turkey spend approximately one-fifth of their day using their smartphones. Such extensive use may lead to disruptions in people’s academic, professional, and social roles in Turkey. For

these reasons, it can be stated that identifying the structures associated with smartphone addiction, and planning and implementing preventive interventions that take these factors into account, is both important and necessary.

Smartphone addiction

Smartphones have become an integral part of daily life across nearly every region of the world (Shi et al., 2023). Excessive smartphone use can lead to addiction; therefore, smartphone addiction has emerged as a significant public health concern today (Andrade et al., 2021; Kim et al., 2023; Yogesh et al., 2024). In the past decade, studies focusing on smartphone addiction have increased (Chen et al., 2023; Marshall et al., 2024). Although this concept, also referred to as excessive or problematic smartphone use (Gao et al., 2022; Ting & Chen, 2020; Yang et al., 2024), has not yet been officially recognized as a clinical disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) or the International Classification of Diseases (ICD-10), it is commonly labeled as smartphone addiction in numerous studies. Behavioral patterns observed in excessive or problematic smartphone use, such as loss of control, withdrawal symptoms, and functional impairment, can be more comprehensively explained within the framework of addiction. Furthermore, recent studies have similarly employed the term “smartphone addiction” to conduct analyses based on a behavioral addiction model (Andrade et al., 2021; Kim et al., 2023; Marshall et al., 2024; Panova & Carbonell, 2018; Yogesh et al., 2024). For these reasons, the present study also adopts the concept of smartphone addiction.

Chen et al. (2023) have stated that smartphone use can lead to addiction because it triggers the release of dopamine in the brain, which produces feelings of pleasure. This addiction has been found to result in tolerance, withdrawal, compulsion, and functional impairments in individuals (Andrade et al., 2021; Haug et al., 2015; Yogesh et al., 2024). Furthermore, smartphone addiction has been associated with psychosocial variables such as depression,

anxiety, loneliness, and social dysfunction; health-related issues such as sleep problems, back pain, vision problems, and obesity; and academic variables such as poor performance among students (Bielawska et al., 2024; Marshall et al., 2024; Shi et al., 2023; Yang et al., 2024; Yogesh et al., 2024). In addition, the frustration of psychological needs also triggers smartphone addiction (Sun et al., 2023).

Addictions may develop when significance, a universal human need, is undermined (Flett et al., 2023). When an individual's sense of personal significance is undermined, a significance quest emerges. Within the framework of the Significance Quest Theory (SQT), the need to feel important and respected—either in one's own eyes or in the eyes of valued others—is defined as the significance quest (Kruglanski & Bertelsen, 2020). For example, Edwards and Neal (2017) found a negative relationship between excessive alcohol consumption and feeling valued. Similarly, Schmidt (2018) reported a negative association between substance misuse and perceived significance. Edwards et al. (2021) found that feelings of insignificance experienced by students in the school environment were positively associated with alcohol use. In Şahin's (2025) study, a positive relationship was found between the significance quest and the tendency toward substance use. Likewise, other studies have reported a positive association between the significance quest and social media addiction (Şahin, 2022; Temiz Çalık, 2025). In light of these findings, it can be suggested that there may also be a relationship between smartphone addiction and the significance quest.

Significance Quest

Significance, considered a fundamental motivational and psychological need, refers to an individual's subjective perception of their social value (Kruglanski et al., 2023; Scarpa et al., 2022). This perception, which provides individuals with resilience and strength, encompasses being recognized, appreciated, feeling valuable, and receiving respect across various domains of life, such as the self, relationships, work, and social groups (Da Silva et al., 2024; Scarpa et

al., 2022). The loss of significance, the perception of a threat to its loss, or opportunities to gain significance directs individuals toward the significance quest (Contu et al., 2023a; Da Silva et al., 2024; Ellenberg & Kruglanski, 2024; Jasko et al., 2020; Kruglanski et al., 2023; Kruglanski et al., 2022; Webber et al., 2017). According to Kruglanski et al. (2021), when one psychological need becomes dominant over all others, individuals behave in extreme ways to satisfy this need at the expense of their other needs. In other words, when the need for significance becomes dominant, individuals are driven toward the significance quest.

According to SQT, the significance quest is not continuously active in a way that persistently directs an individual's behaviors (Ellenberg & Kruglanski, 2024; Kruglanski et al., 2022; Webber et al., 2017). In other words, the significance quest is not always at the forefront of one's mind (Contu et al., 2023a). However, when the significance quest is activated—when individuals are motivated to gain significance or to escape insignificance—they may pursue their passions. Passion may also emerge as a result of significance loss and the subsequent activation of the significance quest (Resta et al., 2022). Research in the literature has shown positive relationships between significance quest and passion (Bélanger et al., 2022; Contu & Pierro, 2024; Resta et al., 2022). According to Vallerand et al. (2007), the construct of passion, which represents the energy underlying persistent engagement in a given behavior, may serve as a mediating variable between the significance quest and excessiveness/addiction in behaviors. Therefore, examining these relationships through a mediation model with these variables will help clarify the results.

Dualistic Model of Passion

Vallerand et al. (2003) define passion as a strong tendency towards an activity that individuals like (or even love), find important, devote time and energy to, and which is internalised in their identity (Vallerand et al., 2007). The dualistic model of passion argues that two types of passion develop as harmonic and obsessive, depending on how the activity is integrated into

the individual's identity (Resta et al., 2022; Vallerand et al., 2007; Vallerand & Paquette, 2024). Harmonic passion results from the autonomous internalisation of the activity into one's identity. The activity with harmonic passion is compatible with other aspects of one's life. It does not occupy a dominant place in one's identity (Philippe, et al., 2008; Vallerand et al., 2003). Therefore, while harmonic passion is central to a person's life, it is not excessive and activities with harmonic passion are flexible and adaptive (Bélanger & Ratelle, 2020). In other words, harmonic passion also contributes to a flexible activity continuity that allows individuals to leave the activity when necessary (Vallerand & Paquette, 2024).

Obsessive passion results from the controlled internalisation of the activity into the individual's identity. Obsessive passion involves a strong desire to participate in the activity, as in harmonic passion. However, this desire to participate is not under the individual's control. On the contrary, the activity seems to control the individual (Vallerand et al., 2003; Vallerand & Paquette, 2024). Individuals are not able to control their internal conditions and therefore cannot avoid participating in the activity (Philippe et al., 2008). Because involvement in the activity is beyond the individual's control, it occupies a disproportionate place in the individual's identity and creates conflict with other activities in his or her life. Alternative goals unrelated to obsessive passion are suppressed (Bélanger et al., 2013; Resta et al., 2022; Vallerand et al., 2003). Thus, obsessive passion reveals the intense pursuit of an activity to the extent that other areas of life are neglected or even suppressed (Contu & Pierro, 2024). In other words, an obsessive passion is a structure that consumes all of a person's attention and energy and overwhelms other areas of life (Resta et al., 2022).

The present study

To fully understand the relationship between smartphone addiction and psychosocial problems, it is important to explore whether there are specific mediating factors that can explain the underlying mechanisms (Shi et al., 2023). Ihm (2018) found a negative

relationship between smartphone addiction and the breadth of peer networks, peer closeness, and social support. Similarly, Yue et al. (2022) reported that social exclusion and loneliness were positively associated with smartphone addiction. In other words, factors such as lack of social support, difficulties in establishing social relationships, and social exclusion may lead individuals to feel insignificant (Liu et al., 2023). A positive association has also been found between feelings of insignificance and another behavioral addiction—Internet addiction (Duradoni et al., 2024; Watson et al., 2022). When an individual experiences a loss of significance, perceives a threat to their significance, or recognizes an opportunity to gain greater significance, the need for significance becomes dominant over other needs, initiating and shaping a wide range of behaviors, including extreme ones (Kruglanski et al., 2021; Resta et al., 2023). Positive relationships have been observed between the significance quest and excessive behaviors (Da Silva et al., 2023; Jasko et al., 2020; Resta et al., 2023). Excessive smartphone use—or smartphone addiction—may similarly be shaped by the dominance of the need for significance and the motivational drive of the significance quest. Individuals may lose control over their behavior while using smartphones despite harmful consequences, driven by motives such as seeking pleasure or escaping pain and stress (Mahapatra, 2019). In a sense, smartphone use may be considered as being guided by obsessive passion.

Lafrenière et al. (2011) found that individuals with low significance experience higher levels of obsessive passion. Similarly, other studies in literature have found positive relationships between significance quest and passion (Contu & Pierro, 2024; Resta et al., 2022). On the other hand, Enwereuzor et al. (2016) found a positive relationship between smartphone addiction and obsessive passion. Accordingly, the present study was conducted based on the assumption that passion may mediate the relationship between the significance quest and smartphone addiction. Since there is no instrument available to assess the passion structure in Turkish culture, the research was designed as two studies, and in Study 1, the Passion Scale

developed by Vallerand et al. (2003) was adapted into Turkish culture. Study 2 then examined the mediating roles of obsessive and harmonic passion in the relationship between the significance quest and smartphone addiction.

Previous research has shown that harmonious and obsessive passion are associated with various motivational and behavioral outcomes (Vallerand et al., 2003). Considering differences in social norms, cultural values, and self-perceptions, it can be argued that determining whether the Passion Scale is reliable and valid within the Turkish culture is important. Moreover, examining whether the scale demonstrates measurement invariance across different genders and types of activities is expected to contribute to the literature (Beaton et al., 2000). In particular, the Dual Passion Model predicts that passion should exhibit a similar structural pattern regardless of the type of activity. Therefore, testing measurement invariance across different activity types is critical for testing the scale's theoretical assumptions. Within this framework, the hypotheses of the study can be outlined as follows:

H1. The two-factor structure of the Passion Scale is valid and reliable in Turkish culture.

H2. The two-factor passion model has measurement invariance across groups formed according to gender (male and female), age group (15-18, 19-25) and activity type (artistic, sports and social media-related activities) in Turkey.

H3. Passion mediates the relationship between significance quest and smartphone addiction.

Method

Study 1

Design and Participants

In Study 1, it is aimed to adapt the Passion Scale to Turkish culture, and to provide psychometric evidence of its validity and reliability. In this regard, evidence of construct and criterion validity for the scale, as well as internal consistency and stability reliability

coefficients, was examined. This point of view shows that the research is classified as descriptive research.

The study involved collecting data via an online survey, using convenience sampling to reach a larger number of participants. The limited generalizability of the study findings, which were obtained from participants selected through convenience sampling, should be taken into account. When collecting data through convenience sampling, data was collected via sources such as Google Forms and email, particularly through links shared within university student groups. The study included individuals who were reached through convenience sampling and who (a) were between the ages of 15 and 35, and (b) voluntarily agreed to participate in the study. Forms with missing data were excluded from the analysis.

Thus, study group consisted of 559 individuals from different ages (17% of participants were adolescents aged 15-18; 75% of participanst aged 19-25; 8% of participants aged 26-35), the majority of whom were university students. The items of the Passion Scale, developed by Vallerand et al. (2003) for adults, were examined and deemed appropriate for use with adolescents. It is also observed that the Passion Scale was used as a data collection instrument in a study conducted in Spain with a sample aged 11 to 20 by Faílde Garrido et al. (2024), and in studies conducted in China with an adolescent sample whose mean age was 15.20 by Wang et al. (2025). Although these studies did not simultaneously include both adolescent and adult samples, the Passion Scale has been used in research involving adolescents; therefore, adolescents were also included in the sample of the present study. After the data was collected, it was divided into two random groups. The sample of the EFA application was named as Group 1 and the CFA application was named as Group 2. The sample sizes were 270 and 289, respectively. There are many suggestions in the literature about determining the sample size. Although there is no definite rule in determining the sample size, in this study, the sample was considered to be sufficient according to the view that there should be 5-10

times as many participants as the number of estimated parameters (Muthén & Muthén, 2002). The number of parameters estimated in DFA (10 factor loadings, 12 error variances, 1 covariance, 2 factor variances) is 25. Based on this criterion, the sample size should be at least 125 (25*5) and ideally 250 (25*10).

The measurement invariance of the scale in different activity types and gender groups was carried out with the whole sample. Participants were assigned to one of seven activity categories (artistic, sports, education, interpersonal relationships, work, social media, other activities) defined by researchers, each of which is at the beginning of the Passion Scale. Participants themselves indicated the activity they spent the most time on or valued the most. In addition, the criterion validity of the scale was examined in a separate group of 134 individuals selected using the convenience sampling method. Table 1 shows the frequencies of the data groups.

Table 1. *Frequencies of demographic characteristics of the groups*

Group	Variable	Level	Frequency	%	% of Age Ranges		
					[15-18]	[19-25]	[26-35]
Group 1 (EFA)	**Gender**	Woman	171	63.3	13.5	77.2	9.4
		Man	96	35.6	27.1	69.8	3.1
		Not specified	3	1.1	33.3	66.7	0
	Types of activities	Art	60	22.2	11.7	80	8.3
		Sport	67	24.8	22.4	71.6	6
		Education	22	8.1	0	77.3	22.7
		Interpersonal relationships	31	11.5	29	67.7	3.3
		Work	9	3.3	55.6	33.3	11.1
		Social media	74	27.4	16.2	79.7	4.1
		Other	7	2.6	28.6	71.4	0

	Total		270				
Group 2 (CFA)	**Gender**	Woman	175	60.6	8.6	82.3	9.1
		Man	112	38.8	25.9	66.1	8
		Not specified	2	.7	50	50	0
	Types of activities	Art	58	20.1	5.2	91.4	3.4
		Sport	77	26.6	19.5	70.1	10.4
		Education	27	9.3	14.8	63	22.2
		Interpersonal relationships	31	10.7	29	71	0
		Work	16	5.5	18.8	56.2	25
		Social media	71	24.6	12.7	81.7	5.6
		Other	9	3.1	22.2	66.7	11.1
	Total		289				

The majority of participants were women in the groups using EFA and CFA. Furthermore, the vast majority of participants in both groups are aged between 19 and 25 (EFA: 71.2%; CFA: 66.1%). The most preferred type in Group 1 was social media activities, while in Group 2, the most preferred type of activity is sports-related activities.

Measures

Passion Scale (PS): The PS developed by Vallerand et al. (2003) is a 14-item instrument with *obsessive* and *harmonic passion* sub-dimensions. The PS, which has 7 items in each sub-dimension, is a seven-point Likert-type scale ranging from "7=strongly agree" to "1=strongly disagree" (Vallerand et al., 2003). Vallerand et al. (2003) randomly divided a sample of 900 college students into two groups in order to examine the factorial validity of the scale. After removing items with low loadings and cross-loadings, EFA conducted on the first group resulted in 14 items; the two-factor structure explained 54.7% of the total variance. CFA

analysis of the second group showed that the model fit the data well (NNFI = 0.912, CFI = 0.926, RMSEA = 0.073). Cronbach's alpha coefficients calculated for the internal consistency of the two factors were found to be .89 and .79 for OP and HP, respectively.

Ambition Scale (AS): Developed by Hirschi and Spurk (2021), AS was adapted to Turkish culture by Şahin and Ayvaz (2025). Both adolescent and adult samples were included in the adaptation study. According to the fit values obtained by CFA in the adaptation study (χ2(4)=12.69, p=.013, CFI=.98, TLI=.96, SRMR=.03, RMSEA=.08, 90% CI [.03, .13]), the scale was a good fit to the data (Şahin & Ayvaz, 2024). The scale consists of five items and a single factor and is a five-point Likert scale. Higher scores on the scale indicate an increase in ambition level. In this study, the Cronbach's alpha value of the scale was calculated as .77 and found to be adequate.

Life Satisfaction Scale (LSS): The LSS is a five-item, seven-point Likert-type measurement tool developed by Diener et al. (1985) and adapted into Turkish by Köker (1991). Higher scores on the scale indicate a greater level of overall life satisfaction. The construct validity of the scale was examined by Yıldız and Baytemir (2016) and the fit indices were found as RMSEA= .03, RMR= .05, SRMR= .01, GFI= 1.0, AGFI= .98, CFI= 1.0, NFI= 1.0 and NNFI= 1.0. Furthermore, the validity and reliability of the scale have been confirmed in the adolescent population in Ercan's (2019) study. In this study, Cronbach's alpha coefficient of the scale was found to be .87, which is adequate.

The Short Grit Scale (GRIT-S): This scale developed by Duckworth and Quinn (2009) was adapted to Turkish culture by Sarıçam et al. (2016). The participants of the adaptation study were individuals in late adolescence and emerging adulthood. In the adaptation study, the model fit indices of the 8-item, 2-factor model obtained from CFA were found to be (χ2/df=2.06, p=.00011, RMSEA= .046, CFI=.95, GFI=.94, AGFI=.93, SRMR=.047). Higher scores on the five-point Likert scale indicate a greater level of grittiness. The reliability

coefficient of the scale was found to be .83 for the whole scale, .80 for the *consistency of interest* factor, and .71 for the *perseverance of effort* factor. The *consistency of ınterest* factor of the Grit Scale includes items related to individual interest, such as "New ideas and projects sometimes distract me from previous ones." In the present study, the *perseverance of effort* factor—containing items such as "I finish whatever I begin."—was used. Since the items in the *perseverance of effort* factor reflect goal commitment and persistent effort, this subscale was utilized to assess the concurrent validity of the PS. In this study, Cronbach's alpha coefficient for this dimension was .71, which is adequate.

Personal Information Form (PIF*)*: In the personal information form, there are questions to determine the participants' gender, age and which activity they are passionate about.

Procedure

In the adaptation study of the Passion Scale into Turkish, the necessary permissions were first obtained. After this stage, it was translated from English to Turkish by five language experts and then from Turkish to English by three experts using the "translation-back translation" method. After the translations were completed, one field expert and one assessment and evaluation expert reviewed the items. They made the necessary cultural and linguistic revisions. The pre-application form was administered to 10 undergraduate students studying in the field of Guidance and Psychological Counseling. The students stated that there was not any unclear expression in any of the scale items. In addition, consistent answers were obtained from each student about what the items meant. Subsequently, the final version of the scale was administered via an online survey to reach a larger number of participants, and data were collected.

After these stages, EFA was conducted to reveal the underlying factor structure of the Passion Scale items within the Turkish cultural context. CFA was conducted to validate the structure in the target culture and to test construct validity. The data were randomly divided into two

groups considering that EFA and CFA applications should be carried out in different samples during the scale adaptation process as stated in the literature (Fabrigar, et. al., 1999). SPSS 25.0 (Data > Select Cases > Random Sample of Cases) was used to randomly split the data into two parts. The EFA and CFA assumptions were tested, and the outliers were removed. The sample sizes were 270 and 289, respectively.

The measurement invariance of the scale in different activity types and gender groups was carried out with the whole sample. In addition, the criterion validity of the scale was examined in a separate group of 134 individuals.

Data analysis

In the adaptation process of PS, SPSS 25.0 was used for EFA and Mplus 7 was used for CFA. CFA was performed using the maximum likelihood robust (MLR) estimation method, as it is robust against potential distribution irregularities, particularly in Likert-type scales. When assessing model fit, we examined the following values: the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), the Root Mean Square Error of Approximation (RMSEA), the Standardised Root Mean Square Residual (SRMR) and the Chi-Square/Degrees of Freedom (χ^2/df). The model-data fit is considered to be acceptable when the following criteria values are met: CFI and TLI ≥ .90, RMSEA ≤ .08, SRMR ≤ .10, and χ^2/df ≤ 5. On the other hand, the model-data fit is considered to be good when the following criteria values are met: CFI and TLI ≥ .95, RMSEA ≤ .05, SRMR ≤ .08, and χ^2/df ≤ 3 (Bentler & Bonett, 1980; Kline, 2011; Schermelleh-Engel et al., 2003). Cohen's (1988) criteria were used to interpret correlation values. According to these criteria, a correlation between two variables is considered low if it is between .10 and .29, moderate if it is between .30 and .49, and high if it is .50 or above. The required sample size was calculated to be 112 using G*Power 3.1.9.7, assuming moderate correlations with the criterion variables and an effect size of 0.30 (r = 0.30; Cohen, 1992). This was based on a significance level (α) of 0.05 and a power level of

0.90. The evaluation was based on the correlations between the participants' total scores obtained using the SPSS 25.0. Additionally, average variance extracted (AVE) and composite reliability (CR) were calculated as construct validity evidences based on the factor loadings obtained from the DFA results. Hair et al. (2019) stated that an AVE ≥ 50 and CR ≥ 0.70 indicate that the items have good convergent and internal consistency.

The reliability of the scale in terms of internal consistency was assessed by calculating the Cronbach's alpha coefficients of the dimensions, while the reliability of the scale in terms of stability was assessed by calculating the correlation coefficient between the two applications through a test-retest application. SPSS 25.0 was used to determine the Cronbach's alpha coefficients and correlations. In the interpretation of reliability coefficients, .70 was taken as the criterion value for adequate reliability (Nunnally, 1978).

Another aim of the study was to examine the measurement invariance of the Turkish version of the PS in groups constructed according to gender and activity types. For this reason, the equivalence of the two-factor structure of the scale in groups constructed according to gender and activity types (artistic, sports and social media activities) was investigated using multi-group CFA method via Mplus 7. The invariance of the model parameters (factor loadings, error variances, factor covariances) was tested with four different models that were progressively restricted. Since the χ^2-value is affected by the sample size, the difference values between the CFI, TLI and RMSEA values (ΔCFI, ΔTLI, ΔRMSEA) were examined in the comparisons between the models. If the decrease in CFI and TLI values is less than or equal to .01 for the more restricted model and less than or equal to .015 for ΔRMSEA, the hypothesis that there is no significant difference between the two models is accepted (Cheung & Rensvold, 2002).

Results

In the first stage, it was aimed to explore the factorial structure of the PS using EFA. The adequacy of the sample size for EFA was tested using the Kaiser-Meyer-Olkin statistic and found to be .90. This value indicates that the sample is adequate. In addition, the Global Barlett test result ($\chi^2(91) = 2058.51$), which tests that the correlations between the items are large enough for EFA, was found to be significant at p=.001 level (Kalaycı, 2005).

In EFA, principal axis factoring and direct oblique rotation methods were used since it was assumed that there was a relationship between the factors. The EFA results are in Appendix 1. EFA findings indicate that PS has a two-factor structure and that these factors explain approximately 62.30% of the total variance. While the first factor explains 39.91% of the variance, the second factor explains 22.39%. Items between 7-14 loaded on the first factor, while items between 1-6 loaded on the second factor. The rotated factor loadings are higher than .60. Each item on the scale loaded on only one factor after rotation, indicating that there were no overlapping items. In addition, the correlation value between the two factors was found to be .239. According to the EFA results, two factors with eigenvalues greater than 1 were identified, accounting for over 50% of the total variance. These findings suggest that the scale has a two-factor structure that is consistent with its original form. The first factor is called "obsessive passion", and the second factor is called "harmonic passion". According to the EFA results, PS is consistent with the original form, except for the loading of the seventh item on the obsessive passion dimension. Thus, the eight-item obsessive passion dimension contributed more to the total variance with the loading of the seventh item on this dimension.

The two-factor structure of the PS was re-tested using CFA in a different sample and the results are presented in Table 2.

Table 2. *Factor loadings obtained by CFA*

Scale items	**HP**	**OP**
1. This activity allows me to live a variety of experiences.	.791	

2. The new things that I discover with this activity allow me to appreciate it even more.	.843	
3. This activity allows me to live memorable experiences.	.742	
4. This activity reflects the qualities I like about myself.	.741	
5. This activity is in harmony with the other activities in my life.	.629	
6. For me it is a passion, that I still manage to control.	.621	
7. I am completely taken with this activity.		.742
8. I cannot live without it.		.826
9. The urge is so strong. I can't help myself from doing this activity.		.884
10. I have difficulty imagining my life without this activity.		.820
11. I am emotionally dependent on this activity.		.811
12. I have a tough time controlling my need to do this activity.		.688
13. I have almost an obsessive feeling for this activity.		.712
14. My mood depends on me being able to do this activity.		.678
Factor Correlations		
HP & OP	.38	

Note. *HP* harmonic passion, *OP* obsessive passion.

According to Table 2, the factor loadings range from .621 to .884. Furthermore, the correlation between the factors is .38. The CFA results were found to be quite consistent with the EFA results.

The model fit statistics obtained from the CFA (CFI=.93, TLI=.91, RMSEA = .08, SRMR = .06, and χ^2/df = 3.03) indicate that the model is acceptable. However, among the CFA findings, it is noted that defining the covariance between the residuals of items 12 and 13 would improve the model, according to the modification index (MI = 51.32). After defining the covariance between residuals, a significant improvement was observed in the model fit

indices, (CFI=.95, TLI=.94, RMSEA = .069, SRMR = .055, and χ^2/df = 2.39). Thus, it can be said that the scale has a valid structure.

Convergent and Divergent Validity of the PS

For the convergent validity of the PS, the relationship between the harmonic passion and obsessive passion dimensions is expected to be positive based on other studies in which the scale was developed, and its validity was examined. In this study, the correlation between the two dimensions was found to be .38, which is similar to the results of other studies. However, studies in literature have found that harmonic passion has a positive relationship with positive emotions, while obsessive passion has a negative or no relationship (Marsh et al. 2013). Based on the studies in the literature, it was considered appropriate to use the Ambition Scale, the Satisfaction with Life Scale, and the Perseverance of Effort subscale of the Grit Scale to assess the concurrent validity of the Passion Scale. These scales were administered to 134 participants, and the correlation coefficients among these constructs are presented in Table 3.

Table 3. *Pearson correlations between HP and OP and variables.*

Variable	OP	HP
Ambition	.10	.25**
Persistence of effort	-.08	.34**
Life satisfaction	-.15	.33**

Note. *HP* harmonic passion, *OP* obsessive passion. **. Correlation is significant at the p = 0.01 level.

According to Table 3, similar to the findings in the literature, harmonic passion has positive and moderate correlations with life satisfaction and perseverance of effort (r=.33, p< .01; r=.34, p<.01), while obsessive passion does not have a significant relationship with either variable. Similarly, while there was a positive and weak correlation between Ambition and

Harmonic Passion (r=.25, p<.05), there was no significant correlation with Obsessive Passion. Among the positive emotions, Ambition has the lowest relationship with Harmonic Passion.

Additionally, AVE and CR were calculated and interpreted together as a measure of how well the items represent their respective factors. AVE = 0.54 and CR = 0.87 were found for the harmonious passion dimension and AVE = 0.59 and CR = 0.92 for the obsessive passion dimension. Both dimensions had CR > 0.70 and AVE > 0.50, indicating good convergent and internal consistency of the items.

Reliability

To demonstrate the reliability of the Passion Scale in terms of stability, a test–retest procedure was conducted. The scale was administered to 64 individuals aged between 18 and 51 ($\bar{X}$ = 29.4) with a six-week interval. The Pearson product–moment correlation coefficient between the two administrations was calculated as .86. In this case, it can be said that the scale has high reliability in terms of stability. Cronbach's alpha values calculated for the Harmonic Passion and Obsessive Passion dimensions for internal consistency were found to be .86 and .91, respectively.

Examining Measurement Invariance Using Multigroup CFA

The measurement invariance of the two-factor structure of the Passion Scale in groups formed according to gender (male and female), age group (15-18, 19-25) and activity types (artistic, sports and social media activities) was investigated with the multi-group CFA. Although participants' responses included many activities (art, sports, education, work, social media, interpersonal relationships), measurement invariance was examined in three groups according to activity type. While the normality assumption required for measurement invariance was met in each group (for artistic activities df=128 p>.05; for sports activities df=145, p>.05; for educational activities df=55 p>.05, for social media activities df=162, p>.05, for interpersonal relationships activities df=71, p>.05 for other activities df=20, p>.05), the unbalanced sample

sizes could lead to a misinterpretation of the results of the multiple-group factor analysis. Similarly, due to the unbalance of the sample in the 26-35 age group compared to other groups, measurement invariance was tested for the other two age groups. This is because the fit function is weighted according to group sample size (Yoon & Lai, 2017). For this reason, only the specified age groups and activity types are included.

Firstly, the assumptions of multivariate statistics were tested. These assumptions are the presence of missing and extreme values in the data, normal distribution of the data and the presence of multicollinearity between variables (Çokluk et al., 2010).

In the first stage of measurement invariance, the two-factor structure of the Passion Scale is expected to fit all data well. CFA was then performed separately in each group in which measurement invariance was to be examined, and the fit of the model was examined (CFA results are in Appendix 2).

The levels of measurement invariance can be tested after the model fit is obtained in each group in which measurement invariance is examined. According to CFA findings based on all data and grouped by age, gender, and activity type, the fit statistics for each group and all data were found to be at an acceptable level.

Table 4. *Results of measurement invariance analysis*

	Model	**CFI**	**TLI**	**RMSEA (90% CI)**	**ΔCFI**	**ΔTLI**	**ΔRMSEA**
Gender	Configural	.933	.920	.073 (.064- .082)	-	-	-
	Metric	.930	.923	.071 (.062- .080)	-.003	.003	-.002
	Scalar	.920	.913	.075 (.067- .084)	-.010	-.010	.004
	Strict	.910	.915	.075 (.067- .083)	-.010	.002	.00
Activity	Configural	.903	.896	.089 (.078 - .100)	-	-	-
	Metric	.902	.898	.086 (.075 - .096)	-.001	.002	-.003
	Scalar	.883	.888	.089 (.079 - .099)	-.019	-.010	.003

	Strict	-	-	-	-	-	-
Age	Configural	.926	.912	.077 (.068 - .087)	-	-	-
	Metric	.925	.918	.075 (.066 - .084)	-.001	.006	-.002
	Scalar	.920	.919	.074 (.066 - .083)	-.005	.001	-.001
	Strict	.872	.879	.091(.083- .098)	-.049	-.040	.017

Looking at Table 4 for the structural model for groups formed according to gender, the goodness of fit statistics are at acceptable levels and it can be said that the structure of the passion model is the same for men and women. The same can be said for the structural model of activity type and age groups. According to the goodness of fit statistics for the metric model, it can be said that the factor loadings do not change according to gender or that the item responses of men and women are similar. A similar comment can be made for the metric model regarding activity types and age groups. We can conclude that the concept of passion is structured similarly in each activity group and age group, and that the scale items are related in a similar way. The fit statistics in the scalar model for gender and age groups indicate a good fit. Therefore, there are also equal correlations between factors in male and female groups and age groups. The fit statistics for the scalar model are insufficient for model fit across activity types. This finding is supported by the ΔCFI value, which is equal to .019. The more restricted model of measurement invariance is based on the previous model. When scalar invariance is not achieved, testing for strict invariance is meaningless. In other words, since latent means cannot be compared in strict invariance, it is meaningless to compare error variances (Vandenberg & Lance, 2016). In this case, it can be said that the two-factor structure and factor loadings of the Passion Scale do not change across activity types and meet the requirements of weak invariance.

In the next step, the equality of error variances was tested with the strict invariance model. According to the model fit statistics, there is no difference in measurement errors between the gender groups. The fit statistics for the strict model are insufficient for model fit across age

groups. This finding is supported by the ΔCFI, ΔTLI, ΔRMSEA values (ΔCFI, ΔTLI >.01 , ΔRMSEA>.015). In this case, we can say that strong factorial invariance is achieved for age groups. The intercept values of the items are equal, and thus the latent means between age groups are comparable.

Study 2

Design and Participants

In this part of the study, the mediating role of passion between significance quest and smartphone addiction was tested. Due to the cross-sectional nature of the study and the examination of direct and indirect relationships between variables, the study is classified as a cross-sectional correlational study. We used a similar procedure to the first study when collecting data through convenience sampling. When collecting data through convenience sampling, data was collected via sources such as Google Forms and email, particularly through links shared within university student groups. The study included individuals who were reached through convenience sampling and who (a) were between the ages of 15 and 35, and (b) voluntarily agreed to participate in the study. Forms with missing data were excluded from the analysis.

The study group consisted of 674 individuals of different age groups (22.6% of participants were adolescents aged 15-18; 57.1% of participanst aged 19-25; 20.3% of participants aged 26-35), mostly university students (63.8 percent female; 57.1 percent 19-25 years old; 73 percent undergraduate students). Since the target group of this study includes adolescents and adults, in line with the original development study of the scale, the sample group was limited to individuals aged 15-35.

Measures

Passion Scale (PS): The PS developed by Vallerand et al. (2003) was adapted to Turkish culture in the first part of the study. According to the EFA results, two factors with

eigenvalues greater than 1 were identified, accounting for 62.3% of the total variance. The goodness-of-fit values obtained from the CFA indicate that the model fits the data well (CFI = .95, TLI = .94, RMSEA = .069, SRMR = .055, and $\chi^2/df = 2.39$). The Cronbach's alpha values calculated for the Harmonic Passion and Obsessive Passion dimensions were found to be .86 and .91, respectively and the correlation coefficient calculated as a result of test-retest application was .86.

Significance Quest Scale (SQS): The SQS, which consists of four sub-dimensions and 26 items, was developed by Şahin and Derin (2023). A higher score on the five-point Likert scale indicates a higher level of intensity in the individual's significance quest. EFA and CFA studies were conducted and the goodness of fit values obtained as a result of CFA were $\chi^2/sd=1.89$, RMSEA=.065, GFI=.86, IFI=.91, TLI=.92 and CFI=.92. The Cronbach's alpha coefficient of the scale was .95 and the correlation coefficient calculated as a result of test-retest application was .84 (Şahin & Derin, 2023). The Cronbach's alpha coefficient of SQS calculated with the data of this study was found to be .95.

Smartphone Addiction Scale - Short Form (SAS-SF): The SAS was developed by Kwon et al. (2013). Then, the 10-item short form of the scale was adapted to Turkish culture by Noyan et al. (2015). Higher scores obtained from the scale, which was answered using a six-point Likert scale, indicate an increase in smartphone addiction. According to the results of the principal component analysis conducted as part of the scale's validity study, the scale's single-factor structure explains 46.3% of the variation in SAS-SF scores. The Cronbach's alpha coefficient of the scale was found to be .88. Cronbach's alpha coefficient of the SAS-SF calculated with the data of this study was found to be .91.

Data analysis

The second part of the study involved conducting a mediator model test using the PS, SQS and SAS-SF online surveys to collect data. Prior to testing the mediation model, assumptions

were checked. First, missing values were examined in the data set, and it was determined that there were no missing data. For univariate outliers, variables were converted to z-scores and values outside the range of +3 and -3 were deleted. Mahalonobis distances of variables were calculated to identify multivariate outliers (Tabachnick & Fidell, 2001). 19 outliers were removed from the analysis. The kurtosis and skewness values of the variables were checked for normality and evaluated together with their standard errors. It can be said that the kurtosis and skewness values of the variables are in the range of -1 and +1 and that they have a normal distribution: harmonic passion (skewness = -0.425, kurtosis = -0.029), obsessive passion (skewness = 0.618, kurtosis = -0.251), smartphone addiction (skewness = 0.257, kurtosis = -0.568), significance quest (skewness = 0.337, kurtosis = 0.101). The Durbin-Watson coefficient of independence of errors was estimated and found to be 1.85. Ho (2014) stated that this value should be between 1.50 and 2.50 for the independence of errors.

Last, to test for multicollinearity, tolerance, VIF, and condition index values were examined in addition to correlations between variables (Hines & Mongomery, 1990). Tolerance values were found to be greater than .10 and VIF values were found to be less than 10. Condition indices are less than 30. Correlation values between variables are shown in Table 5. As it can be understood from the values in Table 5, it can be said that there is no multicollinearity between the variables as there is no correlation value greater than .90 (Çokluk et al., 2010).

After testing multivariate statistical assumptions, the SEM based mediation model was tested. In the SEM-based mediation model analysis, 95% confidence intervals were created using the ML estimation method and the 5000 resampling bootstrap method. If these intervals do not include zero, it can be said that the indirect effect is significant and meaningful (Preacher & Hayes, 2008). SPSS and Mplus 7 were used to analyze the assumptions and the mediation model, respectively.

Results

Before examining the mediating roles of the obsessive and harmonic passion constructs in the relationship between significance quest and smartphone addiction, the correlation values in Table 5 were examined.

Table 5. *Correlations between variables*

	$\bar{X}$	Sd	1	2	3	4
1.HP	30,92	6,84	1	,243**	-,048	,000
2.OP	24,79	11,74		1	,277**	,245**
3.SAS	30,72	11,50			1	,357**
4.SQS	66,25	18,56				1

Notes: ** p< .01, $\bar{X}$ Mean, Sd Standard deviation

Table 5 shows that obsessive passion has a weak relationship with smartphone addiction and significance quest (Cohen, 1988). Harmonic passion has no significant relationship with significance quest and smartphone addiction. For this reason, harmonic passion was removed from the model and the mediating role of obsessive passion in the relationship between significance quest and smartphone addiction was tested (see Figure 1). According to the literature, including harmonic passion in the mediator analysis despite the lack of a meaningful relationship between it and other variables would not be a statistically meaningful approach (Hayes, 2018). Therefore, to increase the statistical power of the model, the harmonic passion variable has been removed from the model. Table 6 presents the results of the mediation model.

Table 6. *Mediation analysis results (unstandardized and standardized coefficients and bootstraps confidence interval)*

					95% CI			
Effect		β	B(se)	*t*	LLCI	ULCI	**Variable**	R^2(se)
	SQS→OP	.050**	.073(.022)	3.25	.040	.114		

Indirect	→SAS							
	SQS→OP	.222**	.387(.084)	4.60	.255	.533	OP	0.05**(.018)
	OP →SAS	.224**	.189(.040)	4.70	.124	.256		
Direct	SQS→ SAS	.314**	.462(.077)	6.03	.334	.587	SAS	0.18**(.030)
Total	SQS→ SAS	.364**	.535(.076)	7.06	.416	.656		

Notes: ** *p*<.01, β *standardized coefficients,* B(se) *standardized coefficients and standard error*

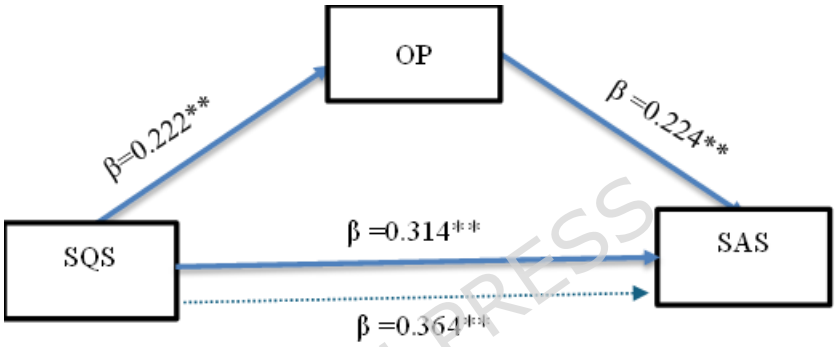

Figure 1. *Mediation model with standardized coefficients*

Upon initial examination of the model fit indices of the SEM-based mediation model, it is evident that the CFI and TLI values are satisfactory, while the RMSEA and SRMR values suggest an excellent fit (χ^2/df =2,90, CFI = .91, TLI = .90, RMSEA = .05, 90% CI = .051 to .055, SRMR = .05).

In the mediation analysis conducted within the structural equation model, the total effect of the significance quest variable on the smartphone addiction variable was found to be statistically significant (B=.535, SE=.076, p<.01). This situation demonstrates that significance quest can generally lead to smartphone addiction. It has been observed that the significance quest has a direct and significant effect on smartphone addiction even when the obsessive passion variable is controlled for (B=0.462, SE=0.077, t=6.03, p<0.01). This result shows that the significance quest affects smartphone addiction not only through obsessive

passion but also directly. As shown in Table 6, the indirect effect mediated by the variable obsessive passion is also statistically significant (B = 0.073, SE = 0.022, t = 3.25). The 95% confidence interval for the indirect effect obtained using the Bootstrap 5000 resampling method was found to be [.04, .11] and did not include zero.

Comparing the total effect between obsessive passion and smartphone addiction (B=0.535, β = 0.364, p<.01) with the direct effect (B=0.462, β = 0.314, p<.01), we see that the power of obsessive passion to predict smartphone addiction decreases. However, when the obsessive passion variable is removed from the model, the relationship between the dependent and independent variables remains significant. In this case, it can be said that obsessive passion has a partial mediating role in the relationship between significance quest and smartphone addiction.

Examining the variance ratios in Table 6, it can be seen that the significance quest variable explained 5% of the obsessive passion variable's variance (R^2 = .05). According to Cohen's (1988) criteria, this indicates a weak explanatory level and small effect size. Together, obsessive passion and the significance quest explain 18% of the variance in smartphone addiction (R^2 = 0.18). This can be considered a medium effect size.

According to the effect size coefficients in Figure 1, it was observed that the significance quest had a small and positive effect on obsessive passion (β = 0.222, p < .01). Similarly, the effect of obsessive passion on smartphone addiction was found to be small and positive (β = 0.224, p < .01). The direct effect of the significance quest on smartphone addiction was moderate and positive (β = 0.314, p < .01). However, the indirect effect mediated by obsessive passion was also significant, with a small positive effect (β = 0.050, p < .01). These findings suggest that obsessive passion partially mediates the relationship between the significance quest and smartphone addiction. Therefore, it can be concluded that smartphone addiction may increase in individuals' significance quest as their obsessive passion

intensifies. In this context, the harmonious passion dimension of the dual passion structure in Hypothesis 3 did not meet the necessary empirical criteria to be included in the model. Only the obsessive passion dimension was tested and mediated the model.

Discussion

In Study 1, an EFA was conducted to determine the structure that the Passion Scale would exhibit in the Turkish cultural context. The results of the EFA revealed that the Passion Scale also has a two-factor structure in the Turkish cultural context. This result is consistent with the study in which the original form of the scale was developed by Vallerand et al. (2003). However, it was observed that the 7th item 'I am completely taken with this activity' in the Harmonic Passion dimension in the original version of the Passion Scale was loaded to the Obsessive Passion dimension as a result of EFA. It is thought that the reason why this item was transferred to the Obsessive Passion dimension is related to the meaning of "*completely*" in Turkish. In the study conducted by Gonçalves et al. (2014), who adapted the Passion Scale to Portuguese culture, this item was also found to load on the Obsessive Passion factor. In the research by Zito and Colombo (2017), who adapted the scale into Italian, the item was removed because it cross-loaded on both factors. Hambleton (2005) notes that the meanings of statements used in scale adaptations may differ from their meanings in the original language. The fact that this item shifted to the Obsessive Passion dimension in the Turkish culture is thought to be related to the meaning of the word "completely" in Turkish. In the Turkish Language Association (TLA) dictionary, the word "*completely*" is defined as "*in an all-encompassing manner, as a whole, as it is, from top to bottom, from head to toe, from beginning to end, throughout, totally, whole, all in all, completely, thoroughly, millimetre by millimeter, line by line, tightly, exactly, fully, wholly, utterly, thoroughly, perfectly, from top to toe, from head to toe, from top to toe, absolutely, precisely*" (TLA, 2025). Based on the meanings of the word in Turkish, it can be said that item 7 corresponds to the nature of

obsessive passion, which involves the controlled internalization of an activity into one's identity but also consumes the individual's attention and energy, thereby overwhelming other areas of life (Resta et al., 2022; Vallerand et al., 2003). In addition, to examine why this item loaded on the Obsessive Passion dimension, interviews were conducted with 17 participants aged between 15 and 35 using a semi-structured interview form. In the interviews, participants were first introduced to the concepts of passion, harmonic passion, and obsessive passion, along with behavioral examples. They were then asked which type of passion the item "I am completely taken with this activity" represented more for them and why. Two participants stated that the item could reflect both types of passion, and one participant reported that it evoked harmonic passion. 14 participants, however, indicated that the item expressed obsessive passion. A common theme among those who identified the item as representing obsessive passion was that the phrase *"completely taken" suggested the activity takes control over the individual and becomes irresistible, much like an addiction*. Obsessive passion takes over to such a degree that the individual struggles to allocate time and energy to other activities. In other words, the person desires to be "completely" invested in this particular activity. For these reasons, item 7 is more aligned with the Obsessive dimension of passion in Turkish culture than with the Harmonic dimension.

It can be stated that the construct validity values of the Passion Scale are consistent with the findings reported in the studies conducted by Gonçalves et al. (2014) and Zito and Colombo (2017). CFA results indicate that the two-factor model fits well (Bentler & Bonett, 1980; Kline, 2011; Schermelleh-Engel et al., 2003). The model was improved by examining CFA modification indices and establishing covariance between the residuals of items 12 and 13. Marsh et al. (2013) improved their model by defining the covariance of these residuals. To do so, however, the items must be theoretically similar, and the theoretical integrity of the model must be preserved (Brown, 2015). Both items load on the obsessive passion factor. When the

contents of these items are also examined, it can be seen that they overlap theoretically. Based on the findings obtained from EFA and CFA, it can be stated that the construct validity of the Passion Scale in Turkish culture has been achieved.

To examine the convergent and discriminant validity of the Passion Scale, the relationships between harmonious and obsessive passion and ambition, perseverance of effort, and life satisfaction were investigated. Resta et al. (2022) reported that ambition was significantly and positively associated with both harmonious and obsessive passion; Verner-Filion et al. (2020) found that perseverance of effort was positively related to harmonious passion but negatively related to obsessive passion; and Salama-Younes (2018) as well as Stenseng and Phelps (2013) reported a positive relationship between life satisfaction and harmonious passion. Consistent with previous research, the present study found that harmonious passion showed significant positive associations with these variables, whereas obsessive passion did not show significant relationships (e.g., Zito & Colombo, 2017). On the other hand, a significant relationship between ambition and obsessive passion might be expected. However, even if an individual is ambitious, they still maintain control over the activity. In contrast, in obsessive passion, the activity takes control over the individual (Bélanger et al., 2013; Resta et al., 2022). Therefore, the absence of a significant relationship between ambition and obsessive passion appears to be understandable.

Results regarding the reliability of the Passion Scale indicate that it is highly reliable in terms of both internal consistency and stability. Within the scope of internal consistency, the Cronbach's alpha coefficients calculated for the harmonic and obsessive passion subdimensions were found to be consistent with the findings reported in the studies conducted by Vallerand et al. (2003), Gonçalves et al. (2014), and Zito and Colombo (2017).

According to the results of the measurement invariance analysis of the Passion Scale, the Turkish form has the same factorial structure in men and women and has equivalent

measurements. Structural, metric, and scalar invariance has been achieved in the analyses conducted for age groups, indicating that the scale meets the psychometric conditions necessary for intergroup comparisons. Although the Passion Scale was originally developed for adults (Vallerand et al., 2003), previous studies have demonstrated that this motivational construct also exists and functions among individuals in adolescence (Faílde Garrido et al., 2024; Tóth-Király et al., 2021; Wang et al., 2025). Adolescence is a period characterized by significant physical, social, emotional, and intellectual changes, during which individuals may become deeply engaged in various activities (Froh et al., 2010). In other words, adolescents may also act with harmonic or obsessive passion (Tóth-Király et al., 2021). Therefore, in the Turkish adaptation study of the Passion Scale, data were collected from an adolescent population as well. This approach allowed for the examination of the scale's validity and reliability across a broader developmental range. It is stated that when constancy is achieved at the scalar level, particularly in demographic group comparisons such as age and gender, the measurement tool is considered fundamentally constant and sufficient for comparative analyses (Milfont & Fischer, 2010). Although the scale used in artistic, sports and social media-related activities does not show strict invariance, individuals' responses to the items and the factorial structure are similar. This situation indicates that the scale has construct validity across different activity groups and that the items are similarly related. Failure to ensure scalar invariance suggests that the intercepts of the items vary by group. In this case, latent mean comparisons between groups may be unreliable (Chen, 2008). Marsh et al. (2013) examined the measurement invariance of the Passion Scale across gender and types of activity. Their findings are consistent with the results of the present study. While strict invariance was established across gender, partial measurement invariance was observed across types of activity. Based on these findings, the authors emphasized the importance of assessing passion across different activities using the same set of items.

In Study 2, which was conducted for the third hypothesis of the research, it was aimed to reveal the relationship between significance quest and smartphone addiction and the mediating role of the dual passion model in this relationship. However, since harmonic passion was not found to have a significant relationship with either the significance quest or smartphone addiction, it was excluded from the mediation model. The absence of a significant relationship between the significance quest and harmonic passion is consistent with the findings reported by Bélanger et al. (2022) and Contu and Pierro (2024). On the other hand, Resta et al. (2022) found a significant positive association between harmonic passion and ambition, which represents a specific dimension of the significance quest, in an Italian sample. However, the same result was not replicated in the American sample of that study. There are individual differences in the intensity of the need for significance (Kruglanski et al., 2014). Individuals with harmonic passion can satisfy their need for significance by engaging in alternative activities and processes without exhibiting extreme behaviours like individuals with obsessive passion and even if they fail in their significance quest.

A research finding consistent with the absence of a significant relationship between harmonic passion and smartphone addiction was reported in the study conducted by Enwereuzor et al. (2016). Similar results have been observed for the relationship between harmonic passion and other types of addiction. For example, Whelan et al. (2021) showed that the relationships between gambling addiction; Wang and Chu (2007) showed that the relationships between gambling addiction and harmonic passion variables were not significant. There is flexible participation in activities carried out with harmonic passion, and this participation makes the individual feel good (Vallerand et al., 2003). However, in smartphone addiction, what is observed is not a flexible engagement in behavior but rather a constant and obsessive involvement. The individual finds it difficult to stop doing the behaviour (Bielawska et al.,

2024; Chen et al., 2023; Shi et al., 2023). For this reason, a relationship between these two constructs may not have been found.

In Study 2, it was found that obsessive passion plays a mediating role in the relationship between the significance quest and smartphone addiction. When an individual begins to perceive a loss of significance or an opportunity to gain significance, even if they are not yet addicted to their smartphone, possessing an obsessive passion may lead their usage pattern toward smartphone addiction. The positive and significant relationship identified between the significance quest and smartphone addiction is consistent with previous research findings that have demonstrated associations between excessive behaviors and the significance quest (Bélanger et al., 2022; Jasko et al., 2020; Kruglanski & Bertelsen, 2020; Kruglanski et al., 2014; Resta et al., 2023; Webber et al., 2017). Research findings (Liu et al., 2023; Yue et al. 2022), which found that there are positive relationships between social exclusion (Bäck et al., 2018) and smartphone addiction (Liu et al., 2023; Yue et al., 2022), which causes the perception of loss of significance, are also in line with our results. The significance quest leads individuals to set goals aimed at attaining a sense of significance (Kruglanski et al., 2022). When an individual cannot appropriately regulate current goals during any experience or threat of lost significance, they may exhibit certain behaviors excessively. Excessive use of the smartphone in this context may lead to the development of the addiction process. In stressful situations such as the painful experience of insignificance (Flett, 2024; Flett et al., 2023) and the loss of significance, which damages the ego (Contu et al., 2023b), smartphone use may create a "security blanket" effect for individuals (Panova & Carbonell, 2018). In other words, in such stressful times, the individual may need a blanket to hide under, and this blanket may eventually take the form of smartphone use and addiction.

According to the Uses and Gratifications (U&G) Theory (Palmgreen & Rayburn, 1979), individuals are assumed to select media environments and content in order to satisfy their

social and psychological needs. The most important assumption of this approach is that the audience is active and media use is goal-oriented. Smartphones offer users a wide range of possibilities, from taking selfies to listening to music, from recording videos to playing mobile games (Leung, 2020). Through these opportunities provided by smartphones, individuals may attempt to prevent a loss of significance or to seize various opportunities to gain significance. When the significance quest is triggered, the individual keeps their smartphone with them, nearby, or in hand to attain satisfaction. For these reasons, it is thought that there are positive and significant relationships betweensignificance quest and smartphone use.

When another dyadic relationship was examined in the mediator model, it was observed that there was a positive and significant relationship between significance quest and obsessive passion. The finding of this study was supported in most of the studies examining the relationship between significance quest and obsessive passion in the literature (Bélanger et al., 2022; Contu & Pierro, 2024; Lafrenière et al., 2011; Resta et al., 2022). A loss of significance can lead to ego insecurity (Contu et al., 2023b). Ego insecurity may be a factor in the relationship between the significance quest and obsessive passion. Studies in the literature have shown the existence of a relationship between ego insecurity and obsessive passion (Bélanger et al., 2013; Lafrenière et al., 2011). In other words, enduring the pain caused by insignificance may be more difficult for individuals with obsessive passion. In this case, an individual may make a strong effort to regain significance, and the effort of those with obsessive passion is likely to be more intense and persistent. An individual with obsessive passion in a significance quest may become more attached to the activity they are engaged in and may struggle to gain significance through it. On the other hand, this activity may take control of him and he may experience conflicts with other roles in his life. These conflicts can lead to negative emotions. The difficulties in fulfilling the other roles in his life and the

conflicts he experiences may make him feel even more insignificant. This insignificance may fuel the obsessive passion again and continue in a spiral, making life difficult for the individual.

The last binary relationship examined in the mediator model is between obsessive passion and smartphone addiction, and a positive and significant relationship was found between these variables. Enwereuzor et al. (2016) found a similar relationship between obsessive passion and smartphone addiction. Considering that obsessive passion creates an insurmountable pressure for the individual's participation in the activity and interferes with other areas in the individual's life, it may lead individuals to addictions (Vallerand et al., 2003; Whelan et al., 2021). In this context, smartphone addiction may develop much faster than others in individuals who are obsessively attached to the activities of the smartphone. The desire to use the smartphone may be out of the control of the individual; a process may occur as if the use of the smartphone controls the individual (Vallerand et al., 2003; Vallerand & Paquette, 2024). In other words, individuals with obsessive passion become unable to spare time for other roles and responsibilities of their lives due to smartphone use. In addition to conflicts with family, friends and other social environment, they may also live in their own inner world. Obsessive passion may make it difficult for an individual to cope with smartphone addiction. Because of this obsessive passion, the person may fail to see opportunities and possibilities in life or ways to escape this challenging process. In a sense, the smartphone to which they are obsessively attached has blinded them.

Theoretical implications

In this study, we found that the Passion Scale based on the dual passion model proposed by Vallerand et al. (2003) was validated in Turkish culture. We can say that the validity study in the first stage will contribute to the literature on the dual passion model in the Turkish sample. In addition, this research represents one of the first applications of SQT in the context of

smartphone addiction or addiction. Within the framework of the theoretical perspective, we established a link between three important psychological constructs, namely the need for significance and the resulting significance quest, obsessive passion, and smartphone addiction. The literature has identified the quest for basic needs such as being significant, having honour, and deserving respect as the primary antecedent of excess (Kruglanski et al., 2022; Resta et al., 2023). By determining the relationship between significance quest and smartphone addiction, which is an extreme behavior, we found that the findings of Bélanger et al. (2022), Jasko et al. (2020), Kruglanski & Bertelsen (2020), Kruglanski et al. (2014), Liu et al. (2023), Resta et al. (2023), Webber et al. (2017), Yue et al. (2022), Bélanger et al. (2022), Contu et al, (2023b), Contu and Pierro (2024), Lafrenière et al. (2011) and Resta et al. (2022), we found that the positive and significant relationship between significance quest and obsessive passion is also similar in Turkish culture. With the result we obtained regarding the positive relationship between obsessive passion and smartphone addiction, we supported the findings of Enwereuzor et al. (2016). Contu et al. (2023b) argued that loss of significance leads to obsessive passion, which in turn leads to extreme behaviors. The result we obtained in our study that obsessive passion mediates the relationship between significance quest and smartphone addiction supported this view of Contu et al. (2023b). On the other hand, the finding that there is no significant relationship between harmonic passion and smartphone addiction and significance quest variables can be interpreted as harmonic passion is not as related to extreme behaviors as obsessive passion.

Limits and Future Directions

This study has certain limitations. Given that this study was conducted with a Turkish sample, the findings can only be generalized to populations with similar characteristics. Considering that the relationships among smartphone addiction, significance quest, and passion may vary across cultural contexts, future research would benefit from conducting cross-cultural

comparative studies. Another limitation of the study concerns the use of convenience sampling and the collection of data through online platforms. Convenience sampling restricts the ability to make inferences about the broader population (Turner, 2020). For this reason, and because each measurement is based on different research conditions and different samples, it is recommended that researchers who will use the Passion Scale in their research should test the factor structure with their own data. Future research on this topic could employ a nationally representative sample, which would enhance the generalizability of the findings and allow for greater geographical diversity in the results. On the other hand, while both studies involved adolescents aged 15–18 and adults, the majority of participants were adult university students. In this context, caution should be exercised when generalizing the results to all individuals aged 15-35. Conducting research with individuals of different age groups and educational levels would increase the generalizability of the results. Although measurement invariance of the Passion Scale across age was examined in the study, the findings and interpretations obtained from studies using the scale should be considered in light of this limitation, given that adolescence, emerging adulthood, and adulthood involve different developmental tasks and conflicts.

Another limitation of the study is that it was designed and conducted using a cross-sectional research design (Kline, 2011). Although cross-sectional findings indicate a mediating relationship, conclusions regarding the temporal ordering or causal relationships among the variables can only be established through longitudinal or experimental studies. Future research adopting a longitudinal design that includes individuals from different life stages may provide a more comprehensive understanding of how the relationships among the examined variables evolve over time. The indirect effect in the relationship between significance quest and smartphone addiction is statistically significant; however, the effect size is small. In other words, while the relationship is statistically significant, its practical

significance may be limited. Future studies may examine different conditions or moderator variables under which the indirect effect may be stronger. In addition, previous studies have demonstrated that constructs such as social anxiety and loneliness are associated with both smartphone addiction (Enez Darcin et al., 2016) and significance quest (Figueroa & Téllez, 2025). Therefore, future research should include these variables in the model as mediators or moderators. Such models may contribute to a more comprehensive understanding of the underlying mechanisms explaining the relationship between significance quest and smartphone addiction.

Practical Implications

In the first study of this research, the two-factor structure of the Passion Scale was confirmed within the Turkish cultural context. Passion represents the underlying energy that fuels an individual's persistent engagement in an activity (Vallerand et al., 2007). Therefore, understanding an individual's level and type of passion toward a specific activity may be important for comprehending the "why" and "how" of their behavior. In this context, correlational studies employing the Dualistic Model of Passion can be conducted to examine its relationships with various variables, such as substance and behavioral addictions, romantic relationships, marriage, work adjustment, job satisfaction, occupational productivity, and life satisfaction. In the second study, obsessive passion was found to mediate the relationship between significance quest and smartphone addiction. Smartphone addiction can negatively affect an individual's physical, psychological, and social health (Andrade et al., 2021; Kim et al., 2023). Therefore, preventive interventions targeting significance quest and obsessive passion—both of which may serve as precursors of smartphone addiction—can be developed. Making individuals feel valued may play a preventive role in protecting them from extreme behaviors such as smartphone addiction. Parents in the family environment and teachers in educational settings can assume a protective role against the risk of smartphone addiction by

helping children feel important. In addition, significance quest was found to be positively associated with obsessive passion. Obsessive passion may prevent individuals from noticing other activities, leading them to become fixated on a single activity. In this case, exposure to and engagement in alternative activities may help prevent the development of obsessive passion. Accordingly, directing children toward diverse activities at home and at school may be recommended. Another finding of the study is that obsessive passion may lead to smartphone addiction. School psychological counselors can identify children with obsessive passion and reduce their risk of smartphone addiction by guiding them toward activities in which they can succeed, such as sports or music. Moreover, counselors can help children develop a sense of significance by enabling them to demonstrate competence and achievement in these new domains.

Conclusion

Recent studies have shown that, on average, people in Turkey spend approximately one-fifth of their day using smartphones. This rate is above the global average, and such intensive smartphone use may pose risks to the physical, social, and psychological health of individuals in Turkey. To contribute to efforts aimed at preventing these risks, the first part of this study sought to identify variables associated with smartphone use by adapting the Passion Scale (PS) to Turkish culture. The findings demonstrated that the scale is a valid and reliable measurement tool for use in Turkey. In the future, the PS may be utilized in various domains such as personality traits, academic achievement, and sports. In the second part of this study, positive relationships were found between significance quest and obsessive passion, between obsessive passion and smartphone addiction, and between significance quest and smartphone addiction. Additionally, obsessive passion was found to mediate the relationship between significance quest and smartphone addiction. Based on these results, it may be suggested that prevention programs for smartphone addiction include interventions aimed at satisfying

individuals' need for significance, as well as supportive efforts to help those whose smartphone use is linked to obsessive passion recognize and overcome this tendency.

Declarations

Ethical Approval: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki Declaration and its later amendments or comparable ethical standards. The study was conducted in accordance with the permission of the Human Research Ethics Committee of Aksaray University in Turkey dated 03.07.2024 and numbered 2024/03-159. Additionally, informed consent was obtained from all participants before completing the survey.

Conflict of Interest: The authors declared no conflicts of interest with respect to the authorship or the publication of this article.

Informed Consent: Informed consent was obtained from all individual participants included in the study.

Open Science Statement

Research data are available with the corresponding author. It will be shared with the authorities upon request.

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Authors' contributions

Conceptualization E. S. Ş.; methodology V. Ö.; implementation of the study E. S. Ş. and V. Ö.; analysis of the results V. Ö., reporting of the findings V. Ö. and E. S. Ş.; writing of the article V. Ö. and E. S. Ş.; review and editing V. Ö. and E. S. Ş.

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Authors' information

Aksaray University, Department of Guidance and Psychological Counseling, Aksaray/Turkey

Ekrem Sedat ŞAHİN

Necmettin Erbakan University, Department of Measurement and Evaluation in Education, Konya/Turkey

Vildan ÖZDEMİR

References

1. Andrade ALM, Kim DJ, Scatena A, Enes CC, Enumo SRF, De Micheli D. Validity and reliability of the Brazilian version of the Smartphone Addiction Scale-Long Version (SAS-LV). *Trends Psychol*. 2021;29(2):302–19. doi:10.1007/s43076-020-00046-y
2. Bäck EA, Bäck H, Altermark N, Knapton H. The quest for significance: Attitude adaption to a radical group following social exclusion. *Int J Dev Sci*. 2018;12(1–2):25–36. doi:10.3233/DEV-170230
3. Beaton DE, Bombardier C, Guillemin F, Ferraz MB. Guidelines for the process of cross-cultural adaptation of self-report measures. *Spine*. 2000;25(24), 3186–3191. https://doi.org/10.1097/00007632-200012150-00014.
4. Bélanger JJ, Adam-Troian J, Nisa CF, Schumpe BM. Ideological passion and violent activism: The moderating role of the significance quest. *Br J Psychol*. 2022;113(4):917–37. doi:10.1111/bjop.12576

5. Bélanger JJ, Lafrenière MAK, Vallerand RJ, Kruglanski AW. When passion makes the heart grow colder: The role of passion in alternative goal suppression. *J Pers Soc Psychol.* 2013;104(1):126–47. doi:10.1037/a0029679
6. Bélanger C, Ratelle CF. Passion in university: The role of the dualistic model of passion in explaining students' academic functioning. *J Happiness Stud.* 2021;22(5):2031–50. doi:10.1007/s10902-020-00304-x
7. Bentler PM, Bonett DG. Significance tests and goodness of fit in the analysis of covariance structures. *Psychol Bull.* 1980;88(3):588–606. doi:10.1037/0033-2909.88.3.588
8. Bielawska O, Weremko M, Rogala M, Giżewska K, Kuc M, Jabłońska K, et al. Smartphone addiction among children and youth. *Medycyna Środowiskowa.* 2024;26(3–4):67–71. doi:10.26444/ms/170832
9. Chen FF. What happens if we compare chopsticks with forks? The impact of measurement invariance in cross-cultural research. *J Pers Soc Psychol.* 2008;95(5):1005–18.
10. Chen Y, Yu Y, Zhu K. Analysis of smartphone addiction today: A literature review. *J Educ Humanit Soc Sci.* 2023;8:921–7. doi:10.54097/ehss.v8i.4382
11. Cheung GW, Rensvold RB. Evaluating goodness-of-fit indexes for testing measurement invariance. *Struct Equ Modeling.* 2002;9(2):233–55. doi:10.1207/S15328007SEM0902_5
12. Cohen J. *Statistical power analysis for the behavioral sciences.* 2nd ed. Hillsdale (NJ): Lawrence Erlbaum Associates; 1988.
13. Contu F, Ellenberg M, Kruglanski AW, Pierro A. People act extremely toward their amorous partner when they feel insignificant. *Pers Relatsh.* 2023;30(4):1293–315. doi:10.1111/pere.12506

14. Contu F, Pierro A. Significance loss brings to extreme self-care related behaviors: the role of interpersonal influence and obsessive (vs. harmonious) passion. *Front Psychol.* 2024;15:1374747. doi:10.3389/fpsyg.2024.1374747

15. Çokluk Ö, Şekercioğlu G, Büyüköztürk Ş. *Multivariate statistics: SPSS and LISREL applications.* Ankara: Pegem Akademi; 2010.

16. DataReportal. *Digital 2024: Turkey.* 2024 [cited 2024 Nov 2]. Available from: https://datareportal.com/reports/digital-2024-turkey

17. Da Silva C, Amadio N, Domingo B, Sarg R, Benbouriche M. The significance quest theory and the 3N model: a systematic review. *Can Psychol.* 2024;65(1):58–70. doi:10.1037/cap0000364

18. Diener E, Emmons RA, Larsen RJ, Griffin S. The Satisfaction With Life Scale. *J Pers Assess.* 1985;49(1):71–5. doi:10.1207/s15327752jpa4901_13

19. Duckworth AL, Quinn PD. Development and validation of the Short Grit Scale (Grit-S). *J Pers Assess.* 2009;91(2):166–74. doi:10.1080/00223890802634290

20. Duradoni M, Severino FP, Belliotti M, Guazzini A. How mattering and anti-mattering experiences across offline and online environments contribute to people's digital life balance and social media addiction. *J Community Appl Soc Psychol.* 2024;34(6):e70008. doi:10.1002/casp.70008

21. Edwards KM, Banyard VL, Charge LL, Kollar LMM, Fortson B. Experiences and correlates of violence among American Indian and Alaska Native youth: a brief report. *J Interpers Violence.* 2021;36(23–24):11808–21. doi:10.1177/0886260520983273

22. Edwards KM, Neal AM. School and community characteristics related to dating violence victimization among high school youth. *Psychol Violence.* 2017;7(2):203–12. doi:10.1037/vio0000065

23. Enez Darcin A, Kose S, Noyan CO, Nurmedov S, Yilmaz O, Dilbaz N. Smartphone addiction and its relationship with social anxiety and loneliness. *Behav Inf Technol.* 2016;35(7):520–5. doi:10.1080/0144929X.2016.1158319

24. Enwereuzor IK, Ugwu LI, Ugwu DI. Role of smartphone addiction in gambling passion and schoolwork engagement: a Dualistic Model of Passion approach. *Asian J Gambl Issues Public Health.* 2016;6:1–23. doi:10.1186/s40405-016-0018-8

25. Ercan H. Investigation of life satisfaction in terms of demographic variables, parent attitudes and personality characteristics in adolescents. *J Fac Educ Bolu Abant Izzet Baysal Univ.* 2019;19(2):501–16. doi:10.17240/aibuefd.2019.19.46660-424906

26. Fabrigar LR, Wegener DT, MacCallum RC, Strahan EJ. Evaluating the use of exploratory factor analysis in psychological research. *Psychol Methods.* 1999;4(3):272–99.

27. Faílde Garrido JM, Dapía Conde MD, Isorna Folgar M, Braña Rey F. Problematic use of video games in schooled adolescents: the role of passion. *Behav Sci (Basel).* 2024;14(11):992. doi:10.3390/bs14110992

28. Figueroa MRH, Téllez MDLCB. Self-esteem and self-concept as predictors of social anxiety in university students. *Rev Educ.* 2025;1–20.

29. Flett G. *The psychology of mattering: Understanding the human need to be significant.* San Diego (CA): Academic Press; 2018.

30. Flett GL. Mattering matters in youth suicidality: implications for implementing in practice. *Child Prot Pract.* 2024;100041. doi:10.1016/j.chipro.2024.100041

31. Flett GL, Casale S, Stoakes A, Nepon T, Su C. Mattering, substance use, and addictive behaviors: review, analysis, and implications for treatment and prevention. *J Ethn Subst Abuse.* 2023;1–34. doi:10.1080/15332640.2023.2218283

32. Froh JJ, Kashdan TB, Yurkewicz C, Fan J, Allen J, Glowacki J. The benefits of passion and absorption in activities: engaged living in adolescents and its role in psychological well-being. *J Posit Psychol.* 2010;5(4):311–32. doi:10.1080/17439760.2010.498624
33. Gonçalves G, Orgambídez-Ramos A, Ferrão MC, Parreira T. Adaptation and initial validation of the Passion Scale in a Portuguese sample. *Escritos Psicol.* 2014;7(2):19–27. doi:10.5231.psy.writ.2014.2503
34. Hair JF, Hult GTM, Ringle CM, Sarstedt M. *A primer on partial least squares structural equation modeling (PLS-SEM).* 2nd ed. Thousand Oaks (CA): SAGE Publications; 2017.
35. Hambleton RK. Issues, designs, and technical guidelines for adapting tests into multiple languages and cultures. In: Hambleton RK, Merenda PF, Spielberger CD, editors. *Adapting educational and psychological tests for cross-cultural assessment.* Mahwah (NJ): Lawrence Erlbaum; 2005. p. 3–38.
36. Hines WW, Montgomery DC. *Probability and statistics in engineering and management science.* New York: John Wiley & Sons; 1990.
37. Hirschi A, Spurk D. Striving for success: towards a refined understanding and measurement of ambition. *J Vocat Behav.* 2021;127:103577. doi:10.1016/j.jvb.2021.103577
38. Ho R. *Handbook of univariate and multivariate data analysis with IBM SPSS.* 2nd ed. Boca Raton (FL): CRC Press; 2014.
39. Kalaycı Ş. *SPSS applied multivariate statistical techniques.* Ankara: Asil Yayın Dağıtım; 2005.

40. Kim C, Kwak K, Kim Y. The relationship between stress and smartphone addiction among adolescents: the mediating effect of grit. *Curr Psychol.* 2023;42(10):8451–9. doi:10.1007/s12144-022-03367-6

41. Kline RB. *Principles and practice of structural equation modeling.* 3rd ed. New York (NY): Guilford Press; 2011.

42. Köker S. *Comparison of life satisfaction levels of normal and problematic adolescents* [master's thesis]. Ankara: Ankara University; 1991. Thesis No. 16802, Council of Higher Education National Thesis Center.

43. Kruglanski AW, Bertelsen P. Life psychology and significance quest: a complementary approach to violent extremism and counter-radicalisation. *J Police Intell Counter Terror.* 2020;15(1):1–22. doi:10.1080/18335330.2020.1725098

44. Kruglanski AW, Ellenberg M, Szumowska E, Molinario E, Speckhard A, Leander NP, et al. Frustration–aggression hypothesis reconsidered: the role of significance quest. *Aggress Behav.* 2023;49(5):445–68. doi:10.1002/ab.22092

45. Kruglanski AW, Gelfand MJ, Bélanger JJ, Sheveland A, Hetiarachchi M, Gunarata R. The psychology of radicalization and deradicalization: how significance quest impacts violent extremism. *Adv Polit Psychol.* 2014;35(1):69–94. doi:10.1111/pops.12163

46. Kruglanski AW, Molinario E, Jasko K, Webber D, Leander NP, Pierro A. Significance-quest theory. *Perspect Psychol Sci.* 2022;17(4):1050–71. doi:10.1177/17456916211034825

47. Kwon M, Lee JY, Won WY, Park JW, Min JA, Hahn C, et al. Development and validation of a smartphone addiction scale (SAS). *PLoS One.* 2013;8(2):e56936. doi:10.1371/journal.pone.0056936

48. Lafrenière MAK, Bélanger JJ, Sedikides C, Vallerand RJ. Self-esteem and passion for activities. *Pers Individ Dif.* 2011;51(4):541–4. doi:10.1016/j.paid.2011.04.017

49. Leung L. Exploring the relationship between smartphone activities, flow experience, and boredom in free time. *Comput Human Behav.* 2020;103:130–9. doi:10.1016/j.chb.2019.09.030

50. Mahapatra S. Smartphone addiction and associated consequences: role of loneliness and self-regulation. *Behav Inf Technol.* 2019;38(8):833–44. doi:10.1080/0144929X.2018.1560499

51. Marsh HW, Vallerand RJ, Lafrenière MAK, Parker P, Morin AJ, Carbonneau N, et al. Passion: does one scale fit all? Construct validity of two-factor passion scale and psychometric invariance over different activities and languages. *Psychol Assess.* 2013;25(3):796–809.

52. Marshall B, Warburton WA, Kangas M, Sweller N. Internet gaming disorder (IGD) and smartphone addiction: parent intervention trial. *Aust J Psychol.* 2024;76(1):2396961. doi:10.1080/00049530.2024.2396961

53. Milfont TL, Fischer R. Testing measurement invariance across groups: Applications in cross-cultural research. *Int J Psychol Res.* 2010;3(1):111–121. https://doi.org/10.21500/20112084.871

54. Muthén LK, Muthén BO. How to use a Monte Carlo study to decide on sample size and determine power. *Struct Equ Modeling.* 2002;9(4):599–620. doi:10.1207/S15328007SEM0904_8

55. Noyan CO, Enez Darcin A, Nurmedov S, Yilmaz O, Dilbaz N. Turkish validity and reliability study of the short form of smartphone addiction scale in university students. *Anatol J Psychiatry.* 2015;16(Suppl 1):73–81.

56. Palmgreen P, Rayburn JD. Uses and gratifications and exposure to public television: a discrepancy approach. *Commun Res.* 1979;6(2):155–79. doi:10.1177/00936502790060020

57. Panova T, Carbonell X. Is smartphone addiction really an addiction? *J Behav Addict.* 2018;7(2):252–9. doi:10.1556/2006.7.2018.49

58. Philippe FL, Vallerand RJ, Lavigne GL. Passion does make a difference in people's lives: a look at well-being in passionate and non-passionate individuals. *Appl Psychol Health Well Being.* 2009;1(1):3–22. doi:10.1111/j.1758-0854.2008.01003.x

59. Preacher KJ, Hayes AF. Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behav Res Methods.* 2008;40:879–91.

60. Resta E, Ellenberg M, Kruglanski AW, Pierro A. Marie Curie vs. Serena Williams: ambition leads to extremism through obsessive (but not harmonious) passion. *Motiv Emot.* 2022;46(3):382–93. doi:10.1007/s11031-022-09936-3

61. Resta E, Ellenberg M, Kruglanski AW, Pierro A. Ambition and extreme behavior: relative deprivation leads ambitious individuals to self-sacrifice. *Front Psychol.* 2023;14:1108006. doi:10.3389/fpsyg.2023.1108006

62. Salama-Younes M. Passion types and subjective well-being for French older adult runners. *J Leis Res.* 2018;49(3–5):177–95. doi:10.1080/00222216.2018.1505160

63. Sarıçam H, Çelik I, Oguz A. Turkish adaptation of The Short Grit Scale (GRIT-S): validity and reliability study. *Int J Turk Lit Cult Educ.* 2016;5(2). doi:10.7884/teke.622

64. Scarpa MP, Zopluoglu C, Prilleltensky I. Mattering in the community: domain and demographic differences in a US sample. *J Community Psychol.* 2022;50(3):1481–502. doi:10.1002/jcop.22728

65. Schermelleh-Engel K, Moosbrugger H, Müller H. Evaluating the fit of structural equation models: tests of significance and descriptive goodness-of-fit measures. *Methods Psychol Res Online.* 2003;8(2):23–74.

66. Schmidt C. *Examining the role of interpersonal and societal mattering in the health and wellbeing of rural adolescents* [doctoral dissertation]. Ann Arbor (MI): University of Michigan; 2018.

67. Shi X, Wang A, Zhu Y. Longitudinal associations among smartphone addiction, loneliness, and depressive symptoms in college students: disentangling between– and within–person associations. *Addict Behav.* 2023;142:107676. doi:10.1016/j.addbeh.2023.107676

68. Stenseng F, Phelps J. Leisure and life satisfaction: the role of passion and life domain outcomes. *World Leis J.* 2013;55(4):320–32. doi:10.1080/04419057.2013.836558

69. Sun R, Li W, Lu S, Gao Q. Psychological needs satisfaction and smartphone addiction among Chinese adolescents: the mediating roles of social anxiety and loneliness. *Digit Health.* 2023;9:2056231203915. doi:10.1177/2055207623120391

70. Şahin ES. Predictive relations between quest for significance and social media addiction of adults. *Int J Mod Educ Stud.* 2022;6(2):378–99. doi:10.51383/ijonmes.2022.195

71. Şahin ES. From ambition to substance use tendency: the mediating role of significance quest. *Front Psychol.* 2025;16:1496907. doi:10.3389/fpsyg.2025.1496907

72. Şahin ES, Ayvaz A. Adapting the Ambition Scale (AS) to Turkish culture. *Turk J Soc Res.* 2025;29(1):164–74. doi:10.20296/tsadergisi.1474776

73. Şahin ES, Derin S. Development, validity and reliability of Significance Quest Scale (SQS). *Int J Educ Res Rev.* 2023;8(3):446–58. doi:10.24331/ijere.1226598

74. Tabachnick BG, Fidell LS. *Using multivariate statistics.* 4th ed. Boston (MA): Allyn & Bacon; 2001.

75. Temiz Çalık T. *Predictive relationships between social media addiction and significance quest of adolescents* [master's thesis]. Aksaray (Turkey): Aksaray

University; 2024. Thesis No. 877187, Council of Higher Education National Thesis Center.

76. Tóth-Király I, Bőthe B, Gál É, Orosz G, Rigó A. Perceived parenting practices as predictors of harmonious and obsessive passion among high schoolers and adults. *J Happiness Stud.* 2021;22(7):2981–99. doi:10.1007/s10902-021-00355-8
77. Turner DP. Sampling methods in research design. *Headache.* 2020;60(1):8–12. doi:10.1111/head.13707
78. Turkish Language Association. *Current Turkish dictionary.* 2025 [cited 2024 Oct 25]. Available from: https://sozluk.gov.tr/
79. Vallerand RJ, Blanchard C, Mageau GA, Koestner R, Ratelle C, Léonard M, et al. Les passions de l'âme: on obsessive and harmonious passion. *J Pers Soc Psychol.* 2003;85(4):756–67. doi:10.1037/0022-3514.85.4.756
80. Vallerand RJ, Paquette V. The role of passion in the resilience process. *Self Identity.* 2024;23(3–4):288–305. doi:10.1080/15298868.2024.2369056
81. Vallerand RJ, Salvy SJ, Mageau GA, Elliot AJ, Denis PL, Grouzet FM, Blanchard C. On the role of passion in performance. *J Pers.* 2007;75(3):505–34. doi:10.1111/j.1467-6494.2007.00447.x
82. Verner-Filion J, Schellenberg BJ, Holding AC, Koestner R. Passion and grit in the pursuit of long-term personal goals in college students. *Learn Individ Differ.* 2020;83:101939. doi:10.1016/j.lindif.2020.101939
83. Watson JC, Prosek EA, Giordano AL. Distress among adolescents: an exploration of mattering, social media addiction, and school connectedness. *J Psychoeduc Assess.* 2022;40(1):95–107. doi:10.1177/07342829211050536
84. Wang CC, Chu YS. Harmonious passion and obsessive passion in playing online games. *Soc Behav Pers Int J.* 2007;35(7):997–1006. doi:10.2224/sbp.2007.35.7.997

85. Wang J, Mao Y, Tang P. The role of passion and affect in adolescents' basketball participation: a self-determination theory perspective. *PLoS One.* 2025;20(10):e0333503. doi:10.1371/journal.pone.0333503

86. We Are Social. *Digital 2023 Global Overview Report.* 2023 [cited 2024 Sep 1]. Available from: https://wearesocial.com/us/blog/2023/01/digital-2023/

87. Whelan E, Laato S, Islam AN, Billieux J. A casino in my pocket: gratifications associated with obsessive and harmonious passion for mobile gambling. *PLoS One.* 2021;16(2):e0246432. doi:10.1371/journal.pone.0246432

88. Yang X, Liu Q, Gao L, Wang G, Liu T. Linking self-esteem to problematic mobile phone use: a moderated mediation model of fear of missing out and ruminative subtypes. *Behav Sci (Basel).* 2024;14(8):683. doi:10.3390/bs14080683

89. Yıldız MA, Baytemir K. A mediation role of self-esteem in the relationship between marital satisfaction and life satisfaction in married individuals. *Inonu Univ J Fac Educ.* 2016;17(1):67–80. doi:10.17679/iuefd.17181627

90. Yogesh M, Ladani H, Parmar D. Associations between smartphone addiction, parenting styles, and mental well-being among adolescents aged 15–19 years in Gujarat, India. *BMC Public Health.* 2024;24(1):1–11. doi:10.1186/s12889-024-19991-9

91. Yoon M, Lai MHC. Testing factorial invariance with unbalanced samples. *Struct Equ Model.* 2017;25(2):201–13. doi:10.1080/10705511.2017.1387859

92. Yue H, Yue X, Zhang X, Liu B, Bao H. Exploring the relationship between social exclusion and smartphone addiction: the mediating roles of loneliness and self-control. *Front Psychol.* 2022;13:945631. doi:10.3389/fpsyg.2022.945631

93. Zito M, Colombo L. The Italian version of the Passion for Work Scale: first psychometric evaluations. *Rev Psicol Trab Organ.* 2017;33(1):47–53. doi:10.1016/j.rpto.2017.01.003