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ORIGINAL RESEARCH

Adaptation of The Nomophobia Scale to The Field of Physical Education and Sports: Alternative Models Strategy Measurement Model Test

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Abstract

This research is; It is the testing of measurement models with the alternative models' strategy of the Nomophobia Scale, which was developed by Yildirim and Correia. For this purpose, data obtained from a sample of 303 physical education and sports undergraduate students in the fall semester of the 2020-2021 academic year. Exploratory and confirmatory factor analysis was applied for the construct validity of the scale. Cronbach Alpha internal consistency and CR coefficients were calculated for reliability. The decomposition and convergence validities of the scale were tested with three alternative models with 3, 2 and 1 factors, using the X^2 difference tests of the predicted four-factor model (inability to access four-item information, losing five-item connection, inability to communicate with six items, not feeling comfortable with five items). The fact that the AVE values of the factors are lower than the CR values and the AVE values above .5 indicate that the factors have a combined validity. The fact that the AVE values of the factors are higher than the MSV and ASV values means that the factors have discrimination validity. In addition, the fact that the AVE scores of the factors are higher than the inter-factor correlations indicate that there is discrimination validity. From these results, the assumed four-factor model is the model that provides the best fit with the data and the scale can be used as a highly valid and reliable tool for the physical education and sports undergraduate student stage.

Keyword: Nomophobia, physical education, alternative models' strategy, construct validity.

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INTRODUCTION

During the troubled pandemic days, we live in, the place of technology in our lives is not a matter of discussion and has taken its place among our obligations. Communication technologies have become inevitable with the increase of hours spent in homes. The impact of smart mobile phones on this development is undoubtedly the highest. When we look at the age range of users, it is seen that the young population's acceptance of new technologies and the rate of using mobile devices is relatively higher than older individuals (Brickfield,1984; Charness and Bosman, 1992; Kennedy, Judd, Churchward, Gray, and Krause, 2008). School years are the most intensive periods of this use, but university years have a large share. Nomophobic (fear of mobile phone deprivation) behaviors can be observed in students who are afraid of being separated from education and communication. Nomophobia, which is called the new phobia of the modern age, comes from the English word nomophobia (NO MObile PHOBIA) and is defined as the irrational fear experienced by the individual when he / she cannot access or communicate on a mobile device in clinical psychology (King, 2013; Yıldırım and Correia, 2015).

It is stated that psychological imbalances suffered by mobile device addicts carry similar symptoms to other psychosocial disorders such as anxiety disorders or unstable mood. In nomophobia, the individual becomes anxious when he forgets to take his phone with him, when his phone is out of charge or out of range. This anxiety negatively affects the concentration of the individual on daily work (Dixit, 2010). Also expressed as the fear of being deprived of mobile phones, nomophobia has increased in parallel with the increase in the prevalence of smartphones (Akıllı, 2016). By testing the measurement model with the alternative models' strategy, with the Nomophobia scale, which we conduct comprehensive validity and reliability studies; During the pandemic, the department of physical education and sports was chosen due to the assumption that it could make effective determinations on undergraduate university students. It is important to consider that the results obtained from the study can be used in studies about the fears of mobile phone deprivation on physical education and sports. The aim of this study is; To test the Nomophobia Scale, which measures mobile phone deprivation fears, to a comprehensive validity and reliability test with alternative models' strategy. In addition, it was aimed to adapt the data obtained from physical education and sports undergraduate students by revealing the evidence for compliance with the original Nomophobia Scale (NMP-Q).

METHODS

Research Model

This study, which examines the adaptation of the nomophobia scale for physical education and sports undergraduate students and its structural validity and reliability features, is basically a screening study. The screening model aims to describe the current situation as it is, and it is a research approach in which the views of the participants about a subject or an event or their characteristics such as interests, skills, abilities and attitudes are determined (Şata, 2016). Approval for the study was obtained from Trakya University Social and Human Sciences Research Ethics Committee with number 2020.08.06.

Universe and Sample

It was used as a model in the research. The research was carried out using the descriptive survey model. The universe of the study was composed of 1290 undergraduate students studying at Trakya University Kırkpınar Faculty of Sport Sciences. For the sample group, 303 students were chosen based on chance and represented the universe of the study. For sample selection, 95% confidence interval (α = 0.05) was taken as the margin of error. According to Yazıcıoğlu and Erdoğan (2004); At least 218 elements are considered sufficient to represent a universe with 1290 elements at ± 0.05 sampling error. The gender, department and grade variables of the students in the sample are presented in Table 1.

Table 1. Demographic Information of the Research Sample

Demographic Variables	**n=303**	**Frequency**	**Percent (%)**
Gender	Female	144	47,5
	Male	159	52,5
Major	Teaching	112	37
	Coaching	98	32,3
	Management	66	21,8
	Recreation	27	8,9
Class	1.Class	89	29,4
	2.Class	92	30,4
	3.Class	41	13,5
	4.Class	81	26,7

Data Collection Tool

The Nomophobia Scale (NMP-Q) developed by Yildirim and Correia (2015) and translated into Turkish by Yildirim, Sumuer, Adnan, and Yildirim (2015) was used as a data collection tool in the study. The Nomophobia Scale (NMP-Q) consists of a total of 20 items in 7-point Likert form. The Cronbach's alpha reliability coefficient of the original of the scale was reported as .95 and the reliability coefficient of the scale translated into Turkish was reported as .92. If this value is above .80, it shows that the scale is of high reliability (Field, 2005).

The scale consists of four sub-dimensions: Loss of Connection (5 items), Inability to Access Information (4 items), Not Feeling Comfortable (5 items), and Inability to Communicate (6 items). The sub-dimensions of the original scale are respectively. 94, .87, .83 and. Reliability coefficients were calculated as 81.

The reliability coefficients of the sub-dimensions of the scale translated into Turkish are 90, .74, .94 and. It has been reported as 91.

Data Collection and Analysis

The data collection process of the research was carried out with the voluntary participation of physical education and sports undergraduate students. In order to test the

construct validity of the nomophobia scale, the DFA was applied to the data set containing the views of 303 students.

Before CFA, mean, standard deviation and item total correlation values for the items of the scale were calculated. In CFA, factor load values, path coefficients between items and dimensions, item statistics, goodness of fit values were calculated (Table 2). As good fit statistics, chi-square good fit ratio (2 (CMIN) / df≤3), goodness fit index (GFI≥0.85), comparative fit index (CFI≥0.92), standard mean square error (SRMR). ≥0.08) and the mean square root of the approximate errors (RMSEA≥0.09) were accepted based on the acceptance limits specified in the literature (Hair, 2010; Meydan and Şeşen, 2015).

In order to test the reliability of the scale, the Cronbach's Alpha (α) reliability coefficients of four sub-dimensions and the whole scale were determined. Cronbach's Alpha (CA≥0.70), average explained variance (AVE≥0.50) and integrated reliability (CR≥0.70) values (Hair, 2010) were taken. As a result of the findings obtained, the scale alternative models strategy was tested with the measurement model test with 4, 3, 2 and 1 factors.

Table 2. Goodness of Fit Indices

Criteria	**Acceptable level**	**Comment**	**Differentiation in literature**
Kay-square	X^2/sd < 2-5	If the ratio of X^2 to degrees of freedom (df) is two or less, the model is a good model, and between two and five shows that the model has an acceptable goodness of fit.	
RMSEA (Root Mean Square Error of Approximation)	< 0.08	A value less than 0.08 indicates a good fit.	A value less than 0.08 indicates a good fit, but values up to 0.10 can be accepted (Kline, 2005).
SRMR (Standardized Root Mean Square Residaul)	< 0.08	A value less than 0.08 indicates a good fit.	
GFI (Goodness of Fit Index)	0 is not compatible, 1 fully compatible	A value greater than .90 indicates acceptable compliance.	Although a value greater than 0.90 is an indicator of good fit, there is no definite limit value (Hair, 1998).
AGFI (Adjusted Goodness of Fit Index)	0 is not compatible, 1 fully compatible	A value greater than .90 indicates acceptable compliance.	Although a value greater than 0.90 is an indicator of good fit, there is no definite limit value (Hair, 1998).
NFI (Nomed Fit Index)	0 is not compatible, 1 fully compatible	A value greater than .90 indicates acceptable compliance.	Although a value greater than 0.90 is an indicator of good fit, there is no definite limit value (Hair, 1998).

NNFI (Nonnomed Fit Index)	0 is not compatible, 1 fully compatible	A value greater than .90 indicates acceptable compliance.	Although a value greater than 0.90 is an indicator of good fit, there is no definite limit (Hair, 1998).
CFI (Comparative Fit Index)	0 is not compatible, 1 fully compatible	A value greater than .90 indicates acceptable compliance.	Although a value greater than 0.90 is an indicator of good fit, there is no definite limit value (Hair, 1998).

Source: Jöreskog (1993), Kline (2011), Loehlin (2004)

FINDINGS

Second Level Construct Validity

The model has been expanded by adding a super latent variable. Confirmatory factor analysis (CFA) was applied by associating the others under a single latent variable that was assumed to include four sub-dimensions. The second-level factorial structure of the fear of mobile phone deprivation (Nomophobia) scale consisting of four sub-dimensions and a total of 20 items (inability to access information with four items, loss of five-item connection, inability to communicate with six items, and inability to feel comfortable with five items) was tested using the AMOS 23 program (Figure 1). Due to the normal distribution of the data, the maximum likelihood calculation method was used (Gürbüz and Şahin, 2018).

The factor load values calculated for the scale items are the ability of those indicators to represent the relevant structure. In this direction, items with a factor load value lower than 0.30 should be removed from the scale in studies (Kline, 2011). No item was removed from the scale since there was no item less than 0.30 as a result of the analysis.

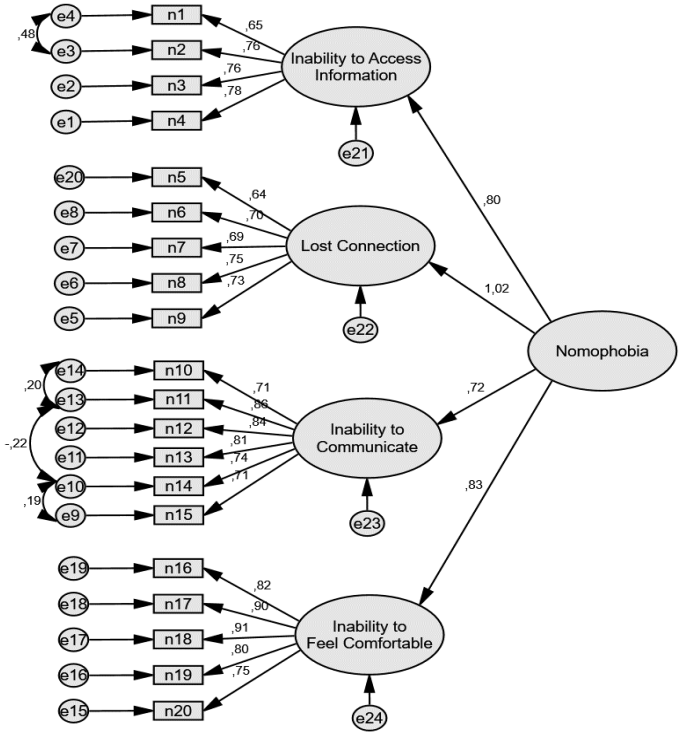

Figure 1. Second-level confirmatory factor analysis diagram.

The obtained goodness of fit values (X2 (N = 303) = 439.744; df = 167; p <0.01; X2 / df = 2.633; RMSEA = 0.074; CFI = 0.932; GFI = 0.86) are the data of the proposed four-factor model. It shows that it is well compatible and acceptable. These results showed that the data obtained from the study were consistent with the predicted theoretical structure of the fear of mobile phone deprivation scale (four-factor model). DFA diagram for the analysis is as above (Figure 1).When the reliability of the scale is examined; Cronbach's Alpha value was calculated separately for each factor. Not being able to access information 0.85; losing connection 0.83; failure to communicate, 0.90; not feeling comfortable was calculated as 0.92. These values show that the scale has a high level of reliability.

Measurement of Decomposition and Union Validity with Alternative Models Strategy

Cronbach's Alpha test, which is a reliability analysis, was applied to the scale of the study by first dividing it into alternative models. The data obtained from the test result showed that the scale has high reliability in all alternative models and are tabulated below (Table 3).

Table 3. Reliability Analysis Table

Reliability Analysis	**Sub-Dimensions**			
Models	Inability to Access Information	Inability to Communicate	Lost Connection	Inability to Feel Comfortable
Four factor model	0,85	0,90	0,83	0,92
Three factor model	0,91	0,90	0,83	
Two factor model	0,91	0,91		
Single factor model	**One Dimension** 0,95			

*Explanation***:** Numerical data are the values of Cronbach's Alpha test, which is a reliability analysis

Afterwards, the measurement model used in the study was tested with confirmatory factor analysis (Arbuckle, 2016). In this context, using the maximum likelihood method, it was analyzed whether the predicted structures of the scales were supported by the collected data or not with the alternative models' strategy (Gürbüz, 2019). The predicted four-factor model (inability to access four-item information, losing five-item connection, not communicating with six items, not feeling comfortable with five items) was compared with three alternative models using the X^2 difference tests. While creating the alternative model, new design factors were created according to the factor loads of the items. As shown in Table 4, the assumed four-factor model was found to be the model that provided the best fit with the data (X^2 (N = 303) = 433.508; p <.001; X^2/ df = 2.643; CFI = 0.93; SRMR = 0.06; RMSEA = 0.07).

Table 4. Model comparison chart

							Model Comparison			
Models	***X²***	***df***	***X²/df***	***CFI***	***SRMR***	***RMSEA***		***ΔX²***	***Δdf***	***p (ΔX²)***
1.Four-factor model[a]	433,508	164	2,643	0,93	0,057	0,07		-	-	-
2.Three factor model[b]	737,772	167	4,418	0,857	0,77	0,1	2 and 1	304,264	3	0,000*
3.Two factor model[c]	988,353	169	5,848	0,79	0,98	0,12	3 and 1	554,845	5	0,000*
4.Single factor model[d]	1213,24	170	7,137	0,7	0,88	0,14	4 and 1	779,732	6	0,000*

Description: N = 264; * p <.001; CFI = Comparative fit index; SRMR = Standardized Root Mean Square Residual; RMSEA = Root mean square error of approximation. a = The proposed model, b = The model in which the factors of not feeling comfortable and the inability to access information are combined c = The model in which the factors of not feeling comfortable, not being able to access information and losing connection are combined, d = The model in which all variables are one factor.

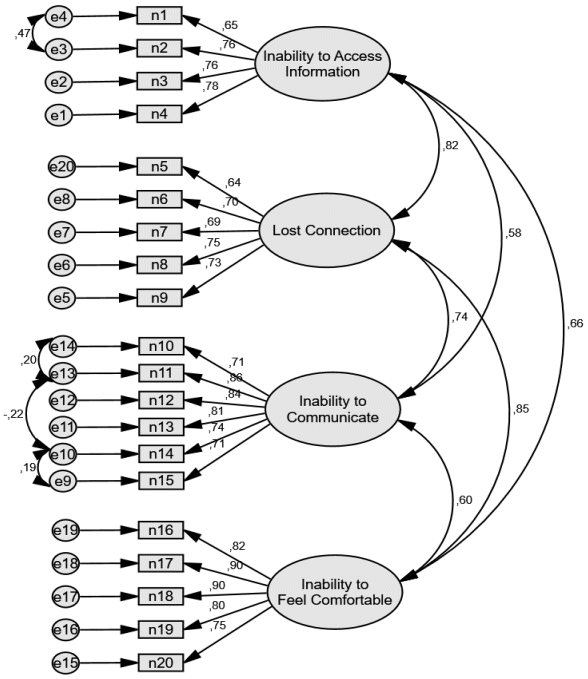

Figure 2. 4 Factor CFA Analysis Diagram

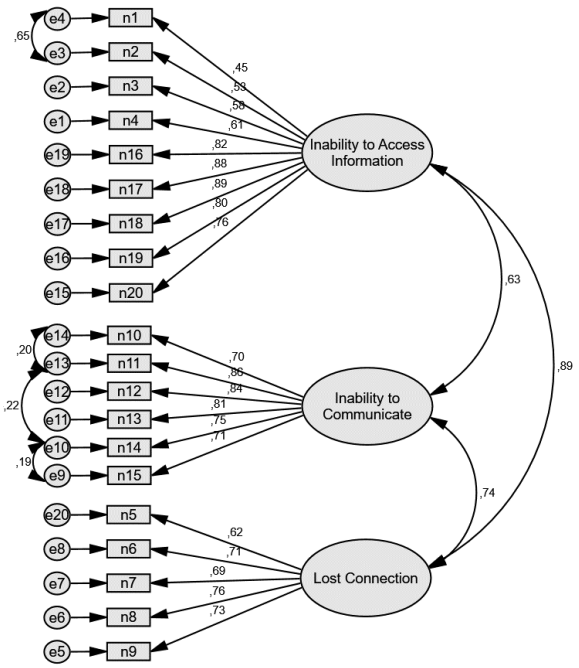

Figure 3. 3 Factor CFA Analysis Diagram

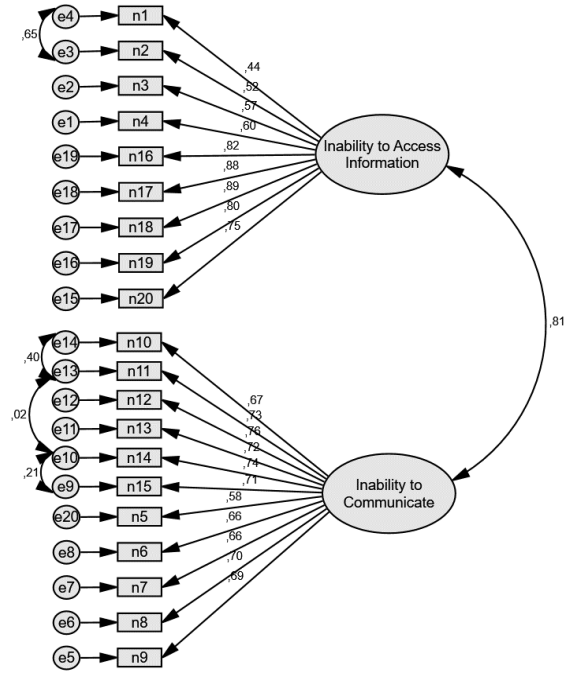

Figure 4. 2 Factor CFA Analysis Diagram

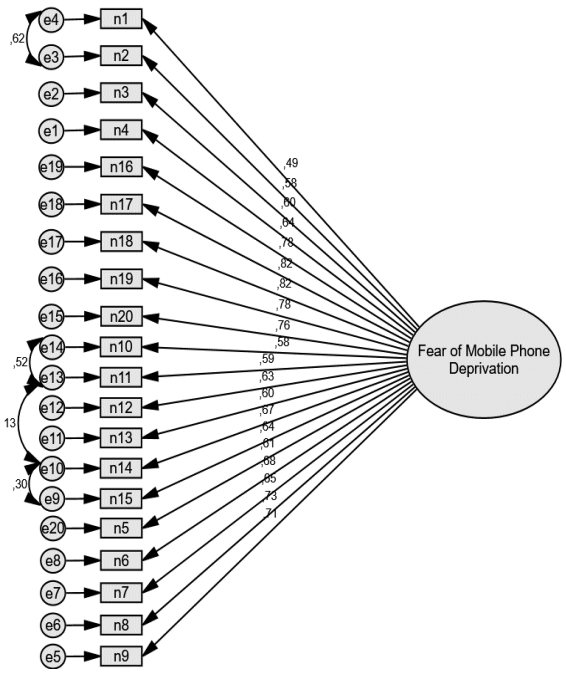

Figure 5. Single Factor CFA Analysis Diagram

CR values were calculated for the reliability of the factors of the nomophobia scale. AVE, MSV and ASV values of the factors were calculated for the combination and decomposition validity. For join validity, AVE> .5; It is recommended to have CR> .7 and CR> AVE, and to have a correlation between MSV <AVE, ASV <AVE and -√AVE> factors for discrimination validity (Gürbüz, 2019; Hair, 2014).

Table 5. Connection and Decomposition Validity

Factors	**CR**	**AVE**	**MSV**	**ASV**	**1**	**2**	**3**	**4**
Inability to Communicate	.91	.61	.55	.417	(.78)			
Inability to Access Information	.85	.56	.44	.424	.58	(.77)		
Lost Connection	.93	.71	.64	.49	.59	.76	(.84)	
Inability to Feel Comfortable	.91	.71	.64	.54	.67	.59	.80	(.84)

Note: Values in parentheses indicate √AVE scores.

These results show that all factors have high reliability (All CR values are above .70). The fact that the AVE values of the factors are lower than the CR values and the AVE values above .5 indicate that the factors have a combined validity. The fact that the AVE values of the factors are higher than the MSV and ASV values means that the factors have discrimination validity. In addition, the fact that the AVE scores of the factors are higher than the inter-factor correlations indicate that there is discrimination validity.

CONCLUSIONS

It is very important to obtain valid and reliable measurements for physical education and sports undergraduate students regarding the level of negative effects of the fear of mobile phone deprivation in terms of developing social programs in order to prevent the negative effects of mobile phone deprivation. It is seen that mobile phones are widely used in almost every age group. By using the confirmatory factor analysis, the factor structure of the undergraduate students of the nomophobia scale was compared with the factor structure of the original, and evidence for the construct validity of the relevant measurements was obtained.

The calculated reliability coefficients, fit indices, factor load and error values for the scale adapted for physical education and sports undergraduate students, as in the original of the scale, four-factor sub-dimensions of "inability to access information, losing connection, not communicating, not feeling comfortable" shows that the model fits well with the data set. In this study, an adaptation study of the "Fear of Mobile Telephone Deprivation Scale" by creating alternative models for undergraduate students of physical education and sports was carried out in order to help new researches.

It was aimed to develop an alternative measurement test by transforming the 4 sub-dimensions that make up the nomophobia scale into a 3-factor model, then a 2-factor model, and finally a 1-factor model. It was determined that the best values (CR, AVE, MSV and ASV) obtained by testing the unity and decomposition validity of each individual model belong to the 4-factor model.

As a result, it is thought that the 4-factor nomophobia scale can make highly valid and reliable measurements on physical education and sports undergraduate students. The scale culturally adapts to physical education and sports undergraduate students, and contributes to the literature as a resource measurement tool for researchers at different universities studying in this department.

REFERENCES

Adnan, M., Gezgin, D. M. (2016). A Modern Phobia: Prevalence of Nomophobia Among College Students. Journal of Faculty of Educational Sciences, 49(1), 141.

Akıllı, G. K., Gezgin, D. M. (2016). Examination of the Relationship Between Nomophobia Levels and Different Behavior Patterns of University Students. Mehmet Akif Ersoy University Journal of Education Faculty, 1(40).

Akın, N. K., Hülya, A. Ş. (2020) Evaluation of Tripartite Efficacy Perceptions in Sports: Adaptation of Self-Efficacy, Other-Efficacy and Relation-Inferred Self-Efficacy Scales into Turkish. Gazi Journal of Physical Education and Sport Sciences, 25(4), 271-288.

Arbuckle, J. L. (2016). IBM® SPSS® Amos™ User's Guide.

Brickfield, C.F. (1984). Attitudes and Perceptions of Older People Toward Technology. P.K. Robinson, J. Livingston, and S.E. Birren (Eds.), Aging and Technological Advances içinde (ss.31-38). New York: Plenum Press.

Charness, N., Bosman, E. A. (1992). Human factors and age. F. I. M. Craik & T. A. Salthouse (Eds.), The Handbook of Aging and Cognition içinde (ss.495-551). Hillsdale, NJ: Erlbaum.

Dixit, S., Shukla, H., Bhagwat, A., Bindal, A., Goyal, A., Zaidi, A., Shrivastava, A. (2010). A Study to

Evaluate Mobile Phone Dependence Among Students of A Medical College And Associated Hospital Of Central India. Indian Journal of Community Medicine, 35(2), 339.

Durnalı, M., Filiz, B. (2019). Adaptation of Delaware School Climate Survey – Student Version into Turkish: The Study of Validity and Reliability. Kastamonu Education Journal, 27(6), 2651-2661

Field, A. (2005). Discovering Statistics Using SPSS (2nd ed.). London: Sage Publication.

Gökçearslan, Ş., Solmaz, E., Kukul, V. (2017). Mobile Learning Readiness Scale: An Adaptation Study. Educational Technology Theory and Practice, 7(1), 143-157.

Güğerçin, U., Aksay, B. (2017 Turkish Adaptation of Dean's Alienation Scale: A Validity and Reliability Study Int. Journal of Management Economics and Business, 13(1), 137-154.

Gürbüz, S. (2019). Structural Equation Modeling With AMOS. Ankara: Seçkin Publishing.

Gürbüz, S., Erkuş, A., Sığrı, Ü. (2010). A New Antecedent of Job Performance and Job Satisfaction: Core Self Evaluation, Journal of Social Sciences and Humanities, 2(1), 69-76.

Hair JR, J. F., Black, W. C. (2010). Barry J. Babin, Rolph E. Anderson. Multivariate Data Analysis.

Jöreskog, K. G. (1993). Testing Structural Equation Models. Sage Focus Editions, 154, 294-294.

Kennedy, G. E., Judd, T. S., Churchward, A., Gray, K., Krause, K. L. (2008). First Year Students' Experiences with Technology: Are They Really Digital Natives? Australasian Journal of Educational Technology, 24(1), 108-122.

King, A.L.S., Valença, A.M., Silva, A.C., Baczynski, T., Carvalho, M.R. Nardi, A.E. (2013). Nomophobia: dependency on virtual environments or social phobia? Computers in Human Behavior, 29(1), 140–144.

Kline, R. B. (2011). Principles and practice of structural equation modeling (3nd ed.). New York London: The Guilford.

Meydan, C., Şeşen, H. (2015). Structural Equation Model AMOS Applications. Detay Publishing: Ankara.

Şahin, F., Gürbüz, S. (2018). Research Methods in Social Sciences. Philosophy-Method-Analysis. Ankara: Seçkin Publishing

Şata, M., Çelik, İ., Ertürk, Z., Taş, U. E. (2016). The Study of Adapting Smartphone Addiction Scale (SAS) For Turkish High School Students. Journal of Measurement and Evaluation in Education and Psychology, 7(1); 156, 169.

Yazicioğlu, Y., Erdoğan, S. (2004). SSPSS Applied Scientific Research Methods. Detay Publishing, Ankara, (s.53).

Yıldırım, C., Correia, A. P. (2015, August). Understanding Nomophobia: A Modern Age Phobia Among College Students. In International Conference on Learning and Collaboration Technologies (pp. 724-735). Springer, Cham.

Yildirim, C., Sumuer, E., Adnan, M., Yıldirim, S. (2015). A Growing Fear: Prevalence of Nomophobia Among Turkish College Students. Information Development, 0266666915599025

Yorulmaz, M. (2019). Development of Ship Performance Scale According to Employee Perception: Validity and Reliability Study. International Journal of Euroasian Researches, 7(16), 1053-1065.