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Original Article

Validity and Reliability of the Greek Version of the Neighbourhood Environment for Physical Activity Scale

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Abstract *— The current study examined the validity and reliability of the Greek version of a five-item Neighbourhood Environment for Physical Activity Scale (Shibata, et al., 2009). Exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed in a sample of 360 students (M ± SD = 23.54 ± 5.96 years). In addition, a CFA was applied in a second sample of 726 physically active adults (M ± SD = 38.80 ± 13.64 years). Further, associations were examined among the Neighbourhood Environment for Physical Activity Scale, physical activity, exercise self-efficacy and various socio-demographic variables. Results indicated: (a) a one-factor solution for the scale, (b) satisfactory validity and reliability coefficients and (c) positive associations between the scale and physical activity. In conclusion, the Neighbourhood Environment for Physical Activity Scale was valid and reliable and could be useful for physical educators and sport scientists.*

Keywords *— validation, factor structure, test-retest, ecological, exercise.*

I. INTRODUCTION

Physical activity (PA) is an effective strategy for the prevention and treatment of metabolic syndrome and cardiovascular diseases, as well as, for the reduction of mortality rates (Savela, et al., 2010; Warburton & Bredin, 2016; WHO, 2018). Despite the apparent benefits of PA, the Eurobarometer survey in European Union countries has indicated an increased from 42% to 46% of adults that never engage in exercise, sports or PA since the previous survey in 2014 (European Commission, 2019). These findings have led to an increased scientific interest in investigating several factors that promote participation in PA (Barnett, Barnett, Nathan, Cauwenberg, & Cerin, 2017; European Commission, 2019; Ishii, Shibata, & Oka, 2010).

In particular, recent studies adopting an ecological framework have indicated that environmental variables are positive predictors of PA levels (Barnett, et al., 2017; Ishii, et al., 2010; Theodoropoulou & Karteroliotis, 2017; Theodoropoulou, Stavrou, & Karteroliotis, 2017). According to the ecological approach, PA behaviour is influenced by a complex interaction among psychosocial and environmental variables (Barnett, et al., 2017; Ishii, et al., 2010; Theodoropoulou & Karteroliotis, 2017). Within the environmental determinants, walkability, safety from crime and access to recreational facilities and sidewalks have been found to be crucial predictors of PA participation (Barnett, et al., 2017; Ishii, et al., 2010). In addition, the Eurobarometer survey has shown that 40% of European adults' PA takes place in parks and outdoors facilities (European Commission, 2019).

Based on the increasingly frequent use of environmental variables for PA prediction and promotion (Barnett, et al., 2017; European Commission, 2019), it is necessary valid and reliable instruments assessing them to be used. Particularly, researchers have often used the five-item scale of Shibata, Oka, Harada, Nakamura and Muraoka (2009) to assess neighbourhood environment perceptions (Ishii, et al., 2010; Theodoropoulou & Karteroliotis, 2017). However, no validity or reliability data of the Neighbourhood Environment for PA Scale have been available in the Greek language, hence prompting the present study. Therefore, the purpose of the current study was to examine the factorial and construct validity and reliability of the Greek version of the Neighbourhood Environment for PA Scale (Shibata, et al., 2009). The hypotheses were that a one-factor solution for the scale would provide an appropriate fit to the data and its validity and reliability properties would be satisfactory.

II. METHOD

A. Participants

a) Criteria of Sample Selection: The participants' selection criteria were the following: (a) participation in PA, (b) 18-65 years old and (c) no missing values. Two independent not randomly selected samples were used.

b) First Sample: The first sample consisted of 360 physical education University students, 191 men (53.06%) and 169 women (46.94%) with a mean age of 23.54 years old (*SD* = 5.96 years) (Figure 1).

c) Second Sample: As figure 1 presents, the second sample consisted of 752 participants (n_{men}=212 and n_{women}=540), ranging in age from 18 to 65 years, who agreed to fill in the questionnaires. This sample participated in various physical activities and exercise programs. However, 26 of the participants were excluded from the analyses due to incomplete information (age, missing values etc.). The remaining 726 participants consisting of 209 men (28.79%)

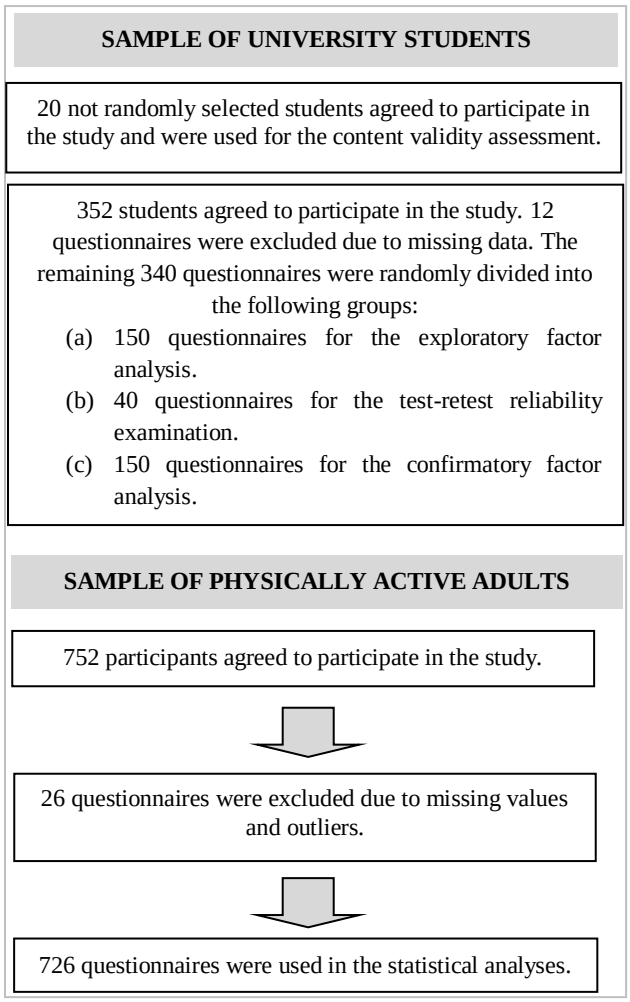

Figure 1. Sampling Diagram

and 517 women (71.21%) with a mean age of 38.80 years old (*SD* = 13.64 years) were used for the final analyses.

B. Measures

a) Neighbourhood Environment for PA Scale: The Neighbourhood Environment for PA Scale (Shibata, et al., 2009) consists of five items: "I possess home fitness equipment", "my neighbourhood provides facilities (e.g., walking trail, park, fitness club) for PA", "my neighbourhood provides a safe and well-maintained environment (e.g., adequate lighting and sidewalks) for PA", "I have access to enjoyable scenery when engaging in PA", and "I frequently observe other people exercising". Each item is assessed on a 4-point Likert scale ranging from 1 (strongly disagree) to 4 (strongly agree). The construct validity (*GFI* = 0.990, *AGFI* = 0.962, *RMSEA* = 0.077) and internal consistency (α = 0.78) of this scale was satisfactory (Ishii, et al., 2010; Shibata, et al., 2009).

b) International Physical Activity Questionnaire (IPAQ): PA levels were estimated with the International Physical Activity Questionnaire (IPAQ, Craig, et al., 2003). The IPAQ-short form has seven days recall period and consists of six items measuring exercise frequency and duration and one item about sedentary life. The six items assesses four PA indexes such as walking PA, moderate PA, vigorous PA and total PA. The PA indexes are expressed in MET - minutes per week and are calculated as duration X frequency per week X MET intensity. Acceptable validity and reliability properties for the IPAQ have been found (Craig, et al., 2003). These findings were verified for the Greek version of the IPAQ (Papathanasiou, et al., 2009; Papathanasiou, et al., 2010).

c) Exercise Self-Efficacy Scale: The five-item Exercise Self-Efficacy Scale (Marcus, et al., 1992) is a frequently used instrument assessing ESE. This scale was designed to evaluate one's confidence in his/her ability to persist in exercising under the following adverse situations: tired, bad mood, not having time, on vacation and raining or snowing. The validity, internal consistency (α = 0.72–0.78) and test-retest reliability (r = 0.90) of the scale are well established (Marcus, et al., 1992), which was confirmed for its Greek version (Theodoropoulou, Stavrou, & Karteroliotis, 2021).

d) Socio-demographic Variables: Age, gender, educational level, marital status, number of children, type of job and income were recorded.

C. Study Design and Procedure

All participants were informed about the procedures of this cross-sectional study and signed a written consent form. Institutional ethical approval was obtained through the University. As Figure 1 presents, 20 students completed the scale for the content validity examination. Then, to assess the factor structure and reliability of the scale 340 students filled in the questionnaires. Furthermore, to test the factorial and construct validity of the scale in a second independent sample, 752 participants filled in the questionnaires (Figure 1).

D. Data Analyses

a) Phase 1. Content Validity, Preliminary Factor Structure and Reliability Testing: At first, 20 students filled in the Neighbourhood Environment for PA Scale in order to examine the relevance and clarity of the questions, as well as, the significance and completeness of responses in the scale. Then, two experts separately reviewed the content of the scale to confirm the appropriateness to measure what it claimed to measure. In addition, to assess the factor structure and internal consistency of the scale, 150 questionnaires were randomly selected from the 340 student sample. To examine the factor structure of the scale, an exploratory factor analysis (EFA) was performed. The extraction method employed was principal axis factoring (PAF) followed by promax rotation (Russell, 2002). The promax method conducts an oblique rotation and if the factors are uncorrelated with one another, the procedure will result in varimax rotation. In the case that the factors are correlated with one another, the procedure will result in oblique rotation. The Bartlett's test of sphericity ($p < 0.05$) and the Kaiser-Meyer-Olkin test (> 0.50) were the criteria to test the sampling adequacy and suitability of the scale's items (Tabachnick & Fidell, 2006). The correlation coefficients among the items (> 0.30) were an additional criterion to test items' suitability (Tabachnick & Fidell, 2006). Extraction of factors was based on the Kaiser's (1961) criterion with eigenvalues greater than 1.0 and the Cattell's (1966) scree test. Factor loadings that exceeded the criterion of 0.40 were regarded as significant. The internal consistency of the scale was assessed using the Cronbach's *alpha* (α) coefficient. The SPSS 25.0 statistical software (SPSS Inc., Chicago, IL, USA) was used.

Finally, to examine the test-retest reliability of the scale, 40 questionnaires that were randomly selected from the remaining data were chosen to be filled in twice with an interval of 15 days between the two assessments. The absolute agreement between the two assessments was conducted using the intraclass correlation coefficient (*ICC*) (Weir, 2005). To describe the variety / difference in the *ICC*, a 95% confidence interval (*CI*) was used.

b) Phase 2. Factor Structure Confirmation in the First Sample: For Phase 2, the remaining 150 questionnaires were used. To confirm the factor structure of the scale found in EFA, a confirmatory factor analysis (CFA) was performed employing maximum likelihood method (Kline, 2005). Factor loadings that exceeded the criterion of 0.40 were regarded as significant (Kline, 2005). Analysis was conducted by using the AMOS 26.0 statistical software (IBM Corporation, Armonk, NY, USA).

Assessment of model fit was based on the following indexes: (a) the *chi-square* test (χ^2), (b) the Satorra-Bentler χ^2/df ratio, (c) the root mean square error of approximation (*RMSEA*) and (d) standardized root mean square residual (*SRMR*) (Steiger, 1990). Non-significant values of χ^2 and values of χ^2/df ratio smaller than 3.0 indicate acceptable fit of model (Kline, 2005). *RMSEA* values lower than 0.05 represent close fit, between 0.05 and 0.08 indicate acceptable fit, whereas *RMSEA* values greater than 0.08 represent poor model fit (Steiger, 1990). *SRMR* values equal to zero indicate perfect model fit. In addition, assessment of model fit was based on the following comparative / incremental fit indexes: (a) Comparative Fit Index (*CFI*), (b) Goodness of Fit Index (*GFI*), (c) Incremental Fit Index (*IFI*) and (d) Tucker and Lewis Index (*TLI*) (Bentler, 1990; Kline, 2005). *CFI, GFI, IFI* and *TLI* values approximating 1.0 indicate perfect fit, whereas values above 0.90 represent acceptable fit of model. However, Hu and Bentler (1999) supported that values of fit indexes such as 0.95 should be used. Recently, these stringent criteria have been debated (Fan & Sivo, 2005; Marsh, Hau, & Wen, 2004).

c) Phase 3. Factorial and Construct Validity Testing in the Second Independent Sample: This phase aimed to verify the factor structure of the scale through CFA and investigate its construct validity based on a second independent sample of 726 physically active adults. To confirm the factor structure of the scale found in students, initially a CFA was performed employing maximum likelihood method. Secondly, the construct validity of the scale was examined applying correlation coefficients among the Neighbourhood Environment for PA Scale and the following questionnaires: (a) IPAQ, (b) Exercise Self-Efficacy Scale and (c) seven socio-demographic items. The hypothesis was that neighbourhood environment perceptions would be positively associated with the: (a) PA indexes of the IPAQ and (b) exercise self-efficacy. To examine the distributions of the apparent variables, the Kolmogorov-Smirnov statistical test was used.

III. RESULTS

A. Phase 1: Content Validity, Exploratory Factor Analysis and Reliability Testing

With regard to the content validity, the 20 students did not provide any misunderstandings during scale's completion, their explanations for each item was in agreement with items' content, sustained that the content of each item matched the content of the scale and they thought that the items and the response scale were clearly understood. In addition, two experts separately reviewed the content of the scale and did not suggest changes according to their written and oral comments on each item.

Regarding the results of the EFA, skewness and kurtosis values were acceptable supporting items' normality (Table 1). As Table 2 presents, the PAF with promax rotation extracted one factor accounted for 60.96% of the total variability among the items. The factor loadings ranged from 0.52 to 0.86 (Table 2). The items' correlations coefficients ranged from 0.37 to 0.76. The Cronbach's a coefficient was 0.84, whereas the ICC coefficient was 0.93 (0.87-0.96 95% CI).

Table 1. Descriptive Statistics of the Neighbourhood Environment for PA Scale (N_1 = 150)

Items	*M*	*SD*	*Min*	*Max*	*Skewness*	*Kurtosis*
1	3.19	0.75	1.00	4.00	-0.91	1.10
2	2.75	0.91	1.00	4.00	-0.28	-0.71
3	2.51	0.94	1.00	4.00	0.08	-0.87
4	2.93	0.79	1.00	4.00	-0.21	-0.62
5	2.91	0.67	1.00	4.00	-0.18	-0.01

Note: *M* = mean, *SD* = standard deviation, *Min* = minimum value, *Max* = maximum value.

Table 2. Exploratory Factor Analysis of the Neighbourhood Environment for PA Scale: Factor Loadings and Communalities (N_1 = 150)

Items	**LOADINGS**	**COMMUNALITIES**
1	0.52	0.27
2	0.79	0.63
3	0.86	0.74
4	0.75	0.57
5	0.64	0.41
Eigenvalue	3.05	
% Explained variance	60.96	
Kaiser-Meyer-Olkin test = 0.778 Bartlett's test of Sphericity: x^2 = 318.18, *df* = 10, *p* = 0.000		

B. Phase 2: Confirmatory Factor Analysis

The skewness (-0.61 to -0.15) and kurtosis (-0.83 to 0.69) values of the items, as well as, the Mardia's (1970) coefficient (3.79) were acceptable. As Table 3 presents, the one-factor model found in EFA provided an adequate fit to the data (χ2 = 18.783, *p* = 0.002, *df* = 5, χ^2/df = 3.757, *CFI* = 0.957, *GFI* = 0.947, *IFI* = 0.958, *TLI* = 0.914, *RMSEA* = 0.137, *SRMR* = 0.044). The factor loadings ranged from 0.66 to 0.81, whereas the items' correlations coefficients varied from 0.46 to 0.74. The Cronbach's a coefficient was 0.86.

An alternative one-factor solution was examined setting a pair of correlated errors between items 2 and 3, based on theoretical rationale (Kline, 2005). The alternative model provided the best fit to the data (χ^2 = 3.441, *p* = 0.487, *df* = 4, χ^2/df = 0.860, *CFI* = 0.999, *GFI* = 0.990, *IFI* = 1.000, *TLI* = 0.989, *RMSEA* = 0.001, *SRMR* = 0.018).

C. Phase 3: Factorial and Construct Validity Testing in the Sample of Physically Active Adults

The skewness (-0.59 to -0.07) and kurtosis (-0.89 to 0.01) values of the items, as well as, the Mardia's (1970) coefficient (6.04) were acceptable. As Table 3 presents, the one-factor model found in EFA provided an adequate fit to the data (χ^2 = 50.597, *p* = 0.000, *df* = 5, χ^2/df = 10.119, *CFI* = 0.945, *GFI* = 0.970, *IFI* = 0.946, *TLI* = 0.890, *RMSEA* = 0.116, *SRMR* = 0.043). The factor loadings ranged from 0.47 to 0.80, whereas the items' correlations coefficients varied from 0.30 to 0.61. The Cronbach's a coefficient was 0.76.

An alternative one-factor solution was examined setting a pair of correlated errors between items 2 and 3, based on theoretical rationale (Kline, 2005). The alternative model provided the best fit to the data (χ^2 = 13.948, *p* = 0.007, *df* = 4, χ^2/df = 3.487, *CFI* = 0.988, *GFI* = 0.992, *IFI* = 0.988, *TLI* = 0.970, *RMSEA* = 0.060, *SRMR* = 0.022). The factor loadings ranged from 0.50 to 0.68.

To assess construct validity, Spearman's correlation coefficients were performed due to the non-normally distributed variables. Specifically, the Neighbourhood Environment for PA Scale was positively associated with the moderate (*r* = 0.11, *p* < 0.05), vigorous (*r* = 0.17, *p* < 0.01) and total (*r* = 0.21, *p* < 0.01) PA indexes.

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IV. DISCUSSION

The current study examined the psychometric properties of the Greek version of the five-item Neighbourhood Environment for PA Scale (Shibata, et al., 2009) in two independent samples of adults. Specifically, the EFA's results indicated that a one-factor solution for the scale represented an appropriate fit to the data in the first group of physical education students. This factor structure of the scale was verified by applying CFAs both in a second group of students and in an independent sample of physically active adults. In addition, the current study demonstrated satisfactory internal consistency and test-retest reliability coefficients for the Neighbourhood Environment for PA Scale. The aforementioned findings are in accordance with those of similar researches in other populations (Ishii, et al., 2010; Shibata, et al., 2009). However, the CFAs' results of the present study indicated a better fit to the data for the scale by setting a pair of correlated errors between items 2 (access to PA facilities) and 3 (access to safe and well-maintained environment for PA). This could be explained by the conceptual similarity between the two items.

Finally, the current study demonstrated positive and low associations among neighbourhood environment perceptions and PA levels supporting the construct validity of the scale. This finding indicated that in order to enhance participation in PA, states should create and maintain environments that promote access to safe and qualitative public and green open spaces, recreational and sport facilities and infrastructure for walking, cycling and other mobility forms (WHO, 2018).

Table 3. Confirmatory Factor Analyses of the Neighbourhood Environment for PA Scale: Fit indexes

Samples	χ^2	*df*	χ^2 / *df*	*CFI*	*GFI*	*IFI*	*TLI*	*RMSEA*	*SRMR*
N_2 **= 150 students**	18.783, p = 0.002	5	3.757	0.957	0.947	0.958	0.914	0.137	0.044
N_2 **= 150 students (alternative model)**	3.441, p = 0.487	4	0.860	0.999	0.990	1.000	0.989	0.001	0.018
N_3 **= 726 adults**	50.597, p = 0.000	5	10.119	0.945	0.970	0.946	0.890	0.116	0.043
N_3 **= 726 adults (alternative model)**	13.948, p = 0.007	4	3.487	0.988	0.992	0.988	0.970	0.060	0.022

Note: χ^2 = chi-square test, *df* = degrees of freedom, χ^2 / *df* = Satorra-Bentler ratio, *CFI* = comparative fit index, *GFI* = goodness of fit index, *IFI* = incremental fit index, *TLI* = Tucker and Lewis index, *RMSEA* = root mean square error of approximation, *SRMR* = standardized root mean square residual.

However, this study had several limitations that need to be reported. First, measures were self-reported and problems associated with common method variance should be considered. Second, the samples were not randomly selected and consisted of students and physically active adults. Third, other validity types, such as criterion validity, were not examined. Fourth, objective measures of environment through geographical information systems technology were not used. Despite the apparent limitations, this study had some advantages that should be taken into account. In particular, a key feature of this study was the investigation of factorial validity and reliability of the Neighbourhood Environment for PA Scale in two independent and large samples that has not been examined until now. Further, other important aspects were the investigation of test – retest reliability, content validity, as well as, construct validity applying associations among the scale and PA and exercise self-efficacy perceptions and various socio-demographic variables.

V. CONCLUSIONS

In conclusion, the Greek version of the Neighbourhood Environment for PA Scale was proven to have satisfactory psychometric properties. A stable factor was identified for the scale examining different samples, indicating that this scale can be used to assess neighbourhood environmental variables. Future studies should be carried out to further investigate the scale's validity in sedentary adults and older or younger individuals.

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REFERENCES

[1] Barnett, D.W., Barnett, A., Nathan, A., Cauwenberg, J. V., & Cerin, E., Built environmental correlates of older adults' total physical activity and walking: A systematic review and meta-analysis. International Journal of Behavioral Nutrition and Physical Activity. 14 (2017) 103.

[2] Bentler, P. M., Comparative fit indices in structural equation models, Psychological Bulletin. 107 (2) (1990) 238-246.

[3] Cattell, R. B., The scree test for the number of factors, Multivariate Behavioural Research. 1 (2) (1966) 245-276.

[4] Craig, C. L., Marshall, A. L., Sjostrom, M., Bauman, A. E., Booth, M. L., Ainsworth, B. E., Pratt, M., Ekelund, U. I. F., Yngve, A., Sallis, J. F., & Oja P., International Physical Activity Questionnaire: 12-country reliability and validity, Medicine and Science in Sports and Exercise. 35 (8) (2003) 1381-1395.

[5] European Commission (2019). Special eurobarometer 412: Sport and physical activity. European Commission.

[6] Fan, X., & Sivo, S. A., Sensitivity of fit indexes to misspecified structural or measurement model components: Rationale of two-index strategy revisited, Structural Equation Modeling. 12 (3) (2005) 343-367.

[7] Hu, L., & Bentler, P. M., Cut off criteria for fit indices in covariance structure analysis: Conventional criteria versus new alternatives, Structural Equation Modeling. 6 (1) (1999) 1-55.

[8] Ishii, K., Shibata, A., & Oka, K., Environmental, psychological and social influences on physical activity among Japanese adults: Structural equation modeling analysis, International Journal of Behavioural Nutrition and Physical Activity. 7 (2010).

[9] Kaiser, H., A note on Guttman's lower bound for the number of common factors, Multivariate Behavioural Research. 1 (1961) 249-276.

[10] Kline, R. B. (2005). Principles and practice of structural equation modeling (2nd ed.). New York, CA: Guilford.

[11] Marcus, B. H., Selby, V. C., Niaura, R. S., & Rossi, J. S., Self-efficacy and the stages of exercise behaviour change, Research Quarterly for Exercise and Sport. 63 (1) (1992) 60-66.

[12] Mardia, K. V., Applications of some measures of multivariate skewness and kurtosis in testing normality and robustness studies, Sankhva. 36 (1970) 115-128.

[13] Marsh, H. W., Hau, K. T., & Wen, Z., In search of golden rules: Comment of hypothesis testing approaches to setting cutoff values for

fit indexes and dangers in overgeneralizing Hu and Bentler's (1999) findings, Structural Equation Modeling. 11 (3) (2004) 320-341.

[14] Papathanasiou, G., Georgoudis, G., Georgakopoulos, D., Katsouras, C., Kalfakakou, V., & Evangelou, A., Criterion-related validity of the short international physical activity questionnaire against exercise capacity in young adults, European Journal of Cardiovascular Prevention and Rehabilitation. 17 (4) (2010) 380-386.

[15] Papathanasiou, G., Georgoudis, G., Papandreou, M., Spyropoulos, P., Georgakopoulos, D., Kalfakakou, V., & Evangelou, A., Reliability measures of the short international physical activity questionnaire (IPAQ) in Greek young adults, Hellenic Journal of Cardiology. 50 (4) (2009) 283-294.

[16] Russell, D. W., The search of underlying dimensions: The use (and abuse) of factor analysis in personality and social psychology bulletin, Personality and Social Psychology Bulletin. 28 (12) (2002) 1629-1646.

[17] Savela, S., Koistinen, P., Tilvis, R. S., Strandberg, A. Y., Pitkala, K. H., Salomaa, V. V., Miettinen, T. A., & Strandberg, T. E., Leisure-time physical activity cardiovascular risk factors and mortality during a 34-year follow-up in men, European Journal of Epidemiology. 25 (9) (2010) 619-625.

[18] Shibata, A., Oka, K., Harada, K., Nakamura, Y., & Muraoka, I., Psychological, social, and environmental factors to meeting physical activity recommendations among Japanese adults, International Journal of Behavioral Nutrition and Physical Activity. 6 (2009) 60.

[19] Steiger, J. H., Structural model evaluation and modification: An interval estimation approach, Multivariate Behavioural Research. 25 (2) (1990) 173-180.

[20] Tabachnick, B. G., & Fidell, L. S. (2006). Using multivariate statistics (5th ed.). Boston, MA: Pearson Allyn and Bacon.

[21] Theodoropoulou, E., & Karteroliotis, K., Intermediary effects for adults' physical activity: Comparison of two structural models, Journal of Biology of Exercise. 13 (2) (2017) 51-65.

[22] Theodoropoulou, E., Stavrou, N., & Karteroliotis, K., Neighborhood environment, physical activity and quality of life in adults: Intermediary effects of personal and psychosocial factors, Journal of Sport and Health Science. 6 (2017) 96-102.

[23] Theodoropoulou, E., Stavrou, N., & Karteroliotis, K., Validity and reliability of the Greek version of the Exercise Self-efficacy Scale, SSRG International Journal of Humanities and Social Science. 8 (2) (2021) 54-59.

[24] Warburton, D. E. R., & Bredin, S. S. D., Reflections on physical activity and health: What should we recommend? Canadian Journal of Cardiology. 32 (4) (2016) 495-504.

[25] Weir, J. P., Quantifying test-retest reliability using the intraclass correlation coefficient and the SEM, Journal of Strength and Conditioning Research. 19 (1) (2005) 231-240.

[26] World Health Organization, Global action plan on physical activity 2018-2030: More active people for a healthier world. Geneva: WHO press(2018).