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VALIDITY AND RELIABILITY STUDY OF THE SCALE FOR INTEREST LEVELS OF UNIVERSITY STUDENTS TO SPORTS (USIL)

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Abstract:
The aim of the study is to develop a valid and reliable scale to measure interests of university students to sports. In the spring of 2016, Validity and reliability research is realized on 600 students getting education at different departments of Karabuk University within the scope of the research. For data collection; Developed by the author "University Students Scale for Interest Levels towards Sports" is used. A measurement tool consisting of two parts is benefited during the data collection process. The first part of measurement tool is demographic information form, while the second part being interest scale towards sports that is prepared in order to determine the interest level of students towards sports. Confirmatory factor analysis is used in order to approve the structure obtained as a result of the explanatory factor analysis. Their accord indexes are examined in order to understand whether the scale is valid or not. Cronbach Alpha internal consistency coefficients of 10 articles that are determined regarding a single factor for the reliability of the scale are calculated. As a result of the conducted studies, one-factor 10-article valid and reliable scale is developed that may measure the interest of students towards sports.

Keywords: university youth, participation in sports activities, physical activity, scale

1. Introduction

The importance of sufficient amount of physical activity among young people for health and welfare is indisputable (Ekelund U., Hildebrand M. and P. J. Collings, 2014). In a

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lifestyle that starts to develop very early in childhood with physical activity; throughout the life beginning from youthhood to adulthood, physical activity continues consistently sometimes with an increasing rate (Telama, Yang, Leskinen et al. 2014). Getting far from physical activity or inactivity having pandemic feature (Prior L., Scott D. Hunter R. et al. 2014) carries importance in terms of adopting sports as the part of life in early ages. It is important to attend regular sports during childhood, then continuing these activities during youthhood and adulthood terms. Therefore, encouraging participation to sports among young people may contribute to public health in the long term (Marques, Ekelund and Sardinha, 2016). For children and young people in today's world; one of the basic interventions to overcome obesity and overweight problems is to increase physical movement and activities (John Cairney J. and Veldhuizen S., 2017). In a research conducted in Australia, it is emphasized that if access to organized sports is not facilitated, the decline of progression to these sports may emerge as an important public health problem in order to ameliorate health in the future (Stewart A. Vellaa, Natasha K., Schranzb, Melanie Davem et al. 2016). On the other hand, it is seen that extensive and very refined interventions along with relevant attitude and talents that target social and physical environments in order to increase free-time physical activity levels among the most disadvantaged parts of the population are needed (Ester Cerin, Eva Leslie, 2008).

According to a study conducted in our country; it is determined that participation level of adolescences to sports is very low (Aslan, N., Arslan Cansever, 2012). It can be expressed that participants consider social environment and information deficiency as the biggest obstacle for participation to free-time activities, while these are being followed by facility/service/transportation and individual psychology factors (Demirel, M.; Harmandar D., 2009).

It is seen that developing and increasing the number of facilities at universities, organizing social and sportive organizations in each term to make them attractive for drawing the attention of young people, offering educational information for the evaluation of free-time activities, giving the awareness of exercising and realizing physical activity in an applied way carry great important in order to ensure the participation of young people to free-time activities (Özşaker M., 2012). On the other hand, Ergül, Alp and Çamlıyer (2015) stated that in order to be able to organize sportive recreation activities, the presence of specialized staff, facility, equipment and sports areas at universities and their harmonious work are required. It is being expressed that almost half of the students in our country are not so satisfied with the campus sports and cultural services, while campus climate and the improvement of facilities to win students back at the university play important role (Çelik A. K., Akyol K. 2015).

In the study conducted by Barnes (2010) on Chinese students, according to university scale results; it is understood that students are not impressed with classrooms, work areas, classroom sizes and insufficient technical tools; in addition investment is needed for the improvement services of recreation and sports facilities.

2. Method

2.1. Model of the Research

The aim of the study is to develop a valid and reliable scale to measure interests of university students to sports. With this feature, the research has the quality of a basic research.

2.2. Participants

In the spring of 2016, Validity and reliability research is realized on 600 students getting education at different departments of Karabuk University within the scope of the research.

2.3. Data Collection Tool

A measurement tool consisting of two parts is benefited during the data collection process. The first part of measurement tool is demographic information form, while the second part being *interest scale towards sports* that is prepared in order to determine the interest level of students towards sports.

A. Demographic Information Form

In the demographic information form; demographic questions (age, gender, faculty or college of education, height, weight, etc.) are given place in order to get information about the students attending the research. In addition to demographic questions, students are asked questions about their alcohol and cigarette smoking conditions, sports branches they are interested, football teams they support and their statuses of active exercising.

B. Scale for Interest Levels towards Sports

This scale is created in order to determine the interest levels of undergraduate students getting education at the university towards sports. The study for creating the scale is realized in four stages. These stages are named as the determination of scale articles, preparation of trial scale, the implementation of the scale, the determination of reliability and validity.

a) **Stage of Determining the Articles:** At this stage, literature and studies related with the determination of the interest levels of individuals to sports are

examined. During the preparation process of the scale; studies realized by Taylor, Panagouleas and Shia Ping Kung (2011), Daly (2000), Koçak (2014), Ceyhun (2017) are utilized.

b) **Preparing the Trial Scale:** At this stage, 20 interest statements towards sports like "sports is a lifestyle", "exercising is one of the best ways of evaluating the free-time", "exercise is made for a healthy life" that determine the interest levels of university students to sports are listed one after another. In front of these statements, a scale with 5-point Likert format that defines opinion as "5- Totally agree", "4- Agree", "3-Partially Agree", "2- Indecisive", "1- Don't agree" is positioned. Data is processed by reversely coding articles that are negative in terms of meaning that are present on the scale. Also, an instruction that gives information about the aim of the scale, respond type, is written in the beginning of the scale. 20 articles that are prepared are controlled by a 2nd person specialized in Turkish Grammar in order to check whether there is a confusion that may cause misunderstanding or whether there is a deficiency in terms of expression along with an expert in the study. Face-to-face interviews are made with students getting education at Karabuk University in order to prepare a valid and reliable measurement tool that may be used for measuring the interest levels of university students to sports. Several Turkish and English sources that deal with the interest towards sports are also examined. Thus, a draft form of 20 articles that may express interest levels of students towards sports is created. 3 unrelated articles are taken out of draft form as a result of the examination made by 2 experts in assessment and evaluation field, 3 experts in physical education field and 2 experts in Turkish education field, and then the trial form of the scale is created over remaining 17 articles.

c) **Implementing Preliminary Stage:** The preliminary stage of the scale that may measure the interest levels of individuals towards sports consisting of 17 articles is applied to 600 university students.

d) **Stage of Determining Reliability and Validity:** *Exploratory factor analysis* is made at the first stage in order to determine the structure validity of the scale while factor analysis is applied and the dimensions of the scale are determined. In order to approve these determined structures, *confirmatory factor analysis* is realized (Tabachnick and Fidell, 2007).

2.4. Implementation

The prepared trial form is applied to 600 students getting education at Karabuk University in 2016 – 2017 educational year. 600 students, who are easily-accessed

among students getting education at Karabuk University, are taken as sample group by using sampling method.

2.5. Processing and Analysing the Data

Data is processed to SPSS 21.0 package program. While response options are processed, 5 value is used for "Totally agree" option, 4 value is used for "Agree" option, 3 value is used for "Indecisive" option, 2 value is used for "Disagree" option and 1 value is used for "Absolutely disagree" option.

The process of creating final scale began after the processing of the data. The process of creating the final scale constitutes of two stages being explanatory factor analysis (EFA) and confirmatory factor analysis (CFA).

In the explanatory factor analysis, it is examined whether KMO and Bartlett Sphericity test and data obtained from trial implementation are in accordance with factor analysis. After it is understood that data may be subject to factor analysis, basic components analysis is used in order to realize factor analysis. With the article analysis based on the total correlation of article, it is examined whether total correlation of article of 17 articles is acceptable, meaning the feature that may be measured with the general scale is the same with the feature that is tried to be measured with each article is the same or not. As a result of the explanatory factor analysis, the scale is defined as single factor and 10 articles.

Confirmatory factor analysis is used in order to approve the structure obtained as a result of the explanatory factor analysis. Their accord indexes are examined in order to understand whether the scale is valid or not. Cronbach Alpha internal consistency coefficients of 10 articles that are determined regarding a single factor for the reliability of the scale are calculated.

3. Findings

3.1. Findings Related to Explanatory Factor Analysis (EFA) Validity Study of the Interest Scale towards Sports

Structural validity of the scale is tested with factor analysis. With this purpose, it is examined whether data obtained from trial implementation is in accordance with the factor analysis. The results of Kaiser-Meyer-Olkin (KMO) and Bartlett tests, which show whether data are in accordance with factor analysis or not, are seen on Table 4.

Table 4: KMO and Bartlett Test Results

Kaiser-Meyer-Olkin Sample Accord Scale		,83
Bartlett Sphericity Test	**X^2**	1263,99
	Sd	45
	p	,000

As it can be seen on Table 4, KMO accord scale value is 0,83. As the critical value is 0,50 according to Leech, Barrett and Morgan (2005); Şencan (2005), they stated that factor analysis cannot be made below the value (Büyüköztürk, Şekercioğlu and Çokluk, 2010, Tavşancıl, 2010). When Kaiser-Meyer-Olkin value belonging to the scale is compared with critical values, it is understood that "0.80 – 0.90" is high level (Büyüköztürk, Şekercioğlu and Çokluk, 2010). Bartlett Sphericity Test calculated for the same data is 1263,99, it is meaningful at 0,01 level (X^2_{45}=1263,99). These values show that the data obtained from trial implementation can be subject to factor analysis. It is decided that the number of samples that are implemented is sufficient in order to realize factor analysis.

The results of the factor analysis that is realized by using basic components analysis are given below.

Table: 5 Factor Proper Values and Description Variances

	Beginning Proper Value			**Square Loading inference total**		
Factor	**Total**	**Vary %**	**Cum. %**	**Total**	**Vary %**	**Cum. %**
1	3,70	36,99	36,99	3,05	30,46	30,46

As it can be seen on Table 5, there is 1 factor with proper value being higher than 1,5. The variance announced by this one factor is 30,46% of the total variance. When beginning proper values are considered, when square loading inference total of the proper value belonging to first factor (3,70) is examined, the results of the first factor regarding proper value (3,05) is bigger than 1,5, it is defined as 1 factor.

The factor loading values of the articles on trial form are given on Table 6.

Table 6: Factor Loading and Article Total Correlation Results Belonging to Articles

	1	**r**
c2	0,70	0,61
c15	0,65	0,56
c13	0,62	0,55
c16	0,62	0,55
c5	0,59	0,54

c1	0,58	0,51
c9	0,47	0,41
c6	0,40	0,37
c4	0,39	0,33
c12	0,38	0,34

*p< ,05

When we take a look at Table – 6, articles no. 1, 2, 4, 5, 6, 9, 12, 13, 15 and 16 have the highest load value in the first factor. When the factor loads of articles are examined in the first factor, it changes between 0,35 and 0,80. According to these load values, the scale is single factor and all articles have load values to take part in the scale. As articles no. 3, 7, 8, 10, 11, 14 and 17 are lower than 0,40 factor load that is determined as factor load values limit value, they are taken out of the study. According to Tabachnick and Fidell (2001), load value of each article being lower than 0,30 critical value is determined as "average" (Ref: Büyüköztürk, Şekercioğlu and Çokluk, 2010). 0,30 factor load is determined as limit value in order to increase the description variance of determined factor.

The results of article analysis made based on total correlation of article are given on Table – 6. According to these results, correlation values change between r=,34 (c12) and r=,61 (c2) and it is meaningful at 0,05 level. Total correlations of article of 10 articles that remained on final scale form have acceptable feature, which means that we can say the feature that can be measured with the general scale is the same with the feature that is tried to be measured with each article; therefore 10 articles have quality to take part in the scale.

3.2. Confirmatory Factor Analysis (CFA) Validity Study of the Interest Scale Towards Sports

Confirmatory factor analysis (CFA) is used in approving the 1-factor structure obtained as a result of the explanatory factor analysis of the scale used in the research. When the following values are examined, the analysis results related to the condition whether the scale provides multivariate normality hypothesis are expressed. According to these values;

Relative Multivariate Kurtosis = 1.201, this value being higher than 1.00 value shows that it doesn't provide multivariate normality hypothesis. Moreover, when Skewness and Kurtosis values are examined, it is meaningful according to p<0,05 , it is seen that it doesn't provide multivariate normality hypothesis.

Table 7: Test of Multivariate Normality for Continuous Variables

Skewness			Kurtosis			Skewness and Kurtosis	
Value	Z-Score	P-Value	Value	Z-Score	P-Value	Chi-Square	P-Value
11.585	20.081	0.000	144.094	11.360	0.000	532.294	0.000

If it provided multivariate normality hypothesis according to these results, we would have used Maximum Likelihood (ML) parameter estimation method but as it didn't provided and as our sample is small, Robust Maximum Likelihood (Robust ML) parameter estimation method is directly used as it doesn't depend on the sample. Our model is 1st Stage 1-Factor Robust ML method.

CFA is implemented in order to evaluate whether 1-factor and 10-article structure of the scale is approved or not. Articles with t value that are not statistically meaningful are examined in the first implemented CFA. According to this examination, there are no articles with t value that is not meaningful. Obtained path diagram is expressed on Figure 1.

Fit indices are found as χ^2=54,33, sd=28, X^2/sd= 1,94, CFI=0.99, NNFI=0.98 and NFI=0.98, GFI=0,97 RMSEA=0.043, SRMR=0,040. When the coefficients showing the relation between the observed variables of the model showing the factorial structure of the scale and their factors, it is understood that fit indices are at a sufficient level. When accord values are examined and when fault values RMSEA and SRMR value is considered, it is expressed that there is a perfect accord. When accord statistics calculated with CFA are considered, it is decided that one-factor structure of the scale that is determined with EFA shows general accord to collected data.

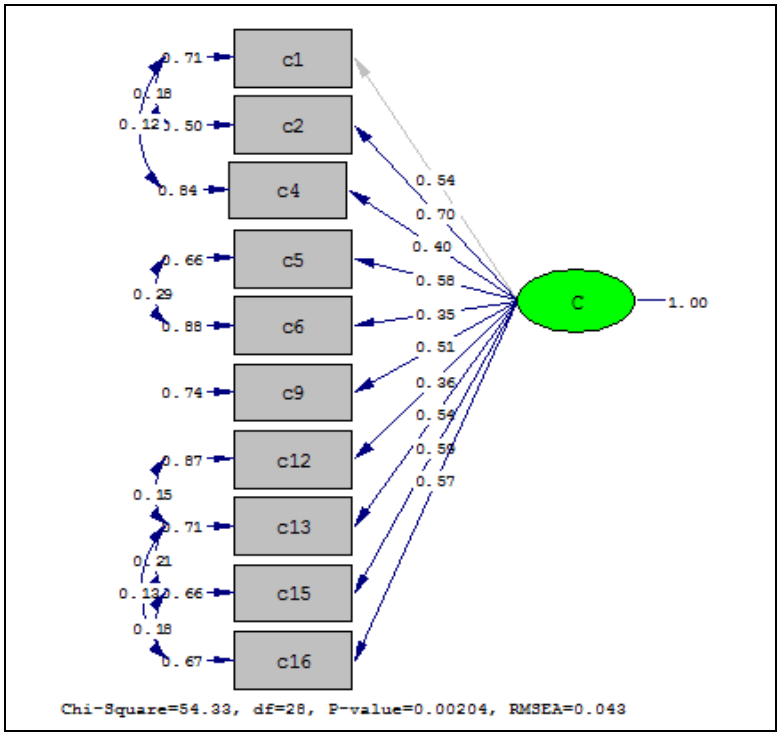

Figure 2: Path Diagram Belonging to C Scale Based on 1st Stage 1-Factor Robust ML Method

When Figure 2 is examined, it is seen that the scale, of which latest condition is given, consists of 10 articles and 1-factor. Regression values and t values of the articles are given on Table 4.

Table 8: Regression and T Values Belonging to CFA

C Scale		
m	**R^2**	**t**
C1	0.29	Fixed
C2	0.50	10,83
C4	0.16	6.95
C5	0.34	8,88
C6	0.12	6.16
C9	0.26	7,36
C12	0.13	5,92
C13	0.29	7.26
C15	0.34	7,64
C16	0.33	8,05

When Table 8 is examined, it is determined that obtained regression coefficients and t values are meaningful and the model is approved. When it is examined in general terms, C2 is the most important article of the scale with R^2=0,50 value while C6 is the least importance article of the scale with R^2=0,12 value.

3.3. Reliability Study of the Scale for Interest Level to Sports

For the reliability of the scale, articles determined for the one factor of C scale are shown on Table 9 looking at Cronbach Alpha internal consistency coefficients. As this coefficient is calculated considering all of the questions, it is the best coefficient that reflects the general reliability structure of the measurement tool compared to other coefficients (Özdamar, 2004).

Table 9: Reliability Coefficients Belonging to Factors

	C Scale
Number of Articles	10
Cronbach α	0,80

According to Table 9, it is seen that Cronbach alpha internal consistency coefficients have 0,80 reliability coefficient with 10 articles at C scale. It is decided that reliability coefficients of this scale is at a high level. It can be said that this scale has acceptable level of internal consistency. It is seen that articles have high level of reliability among themselves according to the reliability coefficients that are present above. Tezbaşaran (1997) states that reliability coefficients that may be considered sufficient on a Likert type scale should be as close as possible to 1. According to these results, it is seen that the whole scale used for the research have high level of reliability.

4. Conclusion

As a result of the conducted studies, one-factor 10-article valid and reliable scale is developed that may measure the interest of students towards sports. 7 articles among those that are present on trial implementation are taken out of the scale as a result of the explanatory factor analysis and analyses are repeated with remaining 10 articles and one-factor structure. The scale is a 5-point Likert scale. Each article is planned from "Totally Agree = 5 to "Totally Disagree = 1". Therefore, total score that can be collected from the scale changes between 10 and 50. High points obtained from the scale show that students have high interest towards sports, while lower points from the scale would mean low interest of students towards sports. When the one-factor and 10-article structure of the scale is examined with a confirmatory factor analysis results after a repeated implementation is made, it is understood that pre-determined structure of the scale is approved in a different sampling group. The scale, which is developed based on literature-support student and expert ideas, is a valid and reliability scale by being approved in a different structured sampling group that is determined with trial

implementation. In this regard, it can be used as a supplementary scale for those who wish to measure interest level towards sports for future studies.

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Appendix

Some of the valid and reliable articles of **USYID** scale that consists of 10 articles:

1) Sports are a lifestyle.

( ) Totally Agree ( ) Agree ( ) Partially Agree ( ) Indecisive ( ) Disagree

2) Sports are part of the education.

( ) Totally Agree ( ) Agree ( ) Partially Agree ( ) Indecisive ( ) Disagree

3) Exercising is one of the best ways of evaluating free-time.

( ) Totally Agree ( ) Agree ( ) Partially Agree ( ) Indecisive ( ) Disagree