

VALIDITY AND RELIABILITY OF THE SUSTAINABILITY IN SPORT SCALE: TURKISH UNIVERSITY STUDENTS²

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ABSTRACT

The purpose of this research is to develop a scale measuring attitudes toward sustainability in sport of the undergraduate education students in the field of sports (Sustainability in Sport Scale- Sus-S). A total of 326 School of Physical Education and Sports of Sakarya University students (125 women, 201 men) participated in the study. The Exploratory Factor Analysis (EFA) and Confirmatory Factor Analysis (CFA) were used to determine the validity of the measurement instrument. In the EFA analysis, the structure with 38 items and six factors was reached as in the original form. The analysis carried out in the scope of the CFA revealed that six factor and 35 items. Cronbach's Alpha reliability coefficient and two half correlation coefficient values are calculated respectively .915 and .823. The findings show that the Sus-S is a reliable and valid measuring instrument to be used to measure Turkish undergraduate students in the field of sports' attitudes towards sustainability in sport.

Key words: Reliability, sport, sustainability, undergraduate students, validity

SPORDA SÜRDÜRÜLEBİLİRLİK ÖLÇEĞİ'NİN GEÇERLİK VE GÜVENİRLİK ÇALIŞMASI: TÜRK ÜNİVERSİTE ÖĞRENCİLERİ

ÖZET

Bu araştırmanın amacı, spor alanında lisans öğrenimi gören öğrencilerin sporda sürdürülebilirliğe ilişkin tutumlarını ölçebilecek bir ölçme aracı (Sporda Sürdürülebilirlik Ölçeği-SSÖ) geliştirmektir. Araştırmaya Sakarya Üniversitesi Beden Eğitimi ve Spor Yüksekokulu'nda öğrenim gören 125'i kadın 201'i erkek 326 öğrenci katılmıştır. Ölçme aracının güvenilirliğini tespit etmek amacıyla Açıklayıcı Faktör Analizi (AFA) ve Doğrulayıcı Faktör Analizi (DFA) kullanılmıştır. DFA sonunda ölçeğin 38 madde ve altı alt boyuttan oluştuğu tespit edilmiştir. DFA sonucunda ise 6 boyut ve 35 maddelik yapı doğrulanmıştır. Cronbach's Alpha güvenilirlik katsayısına ve iki yarı test korelasyonu katsayısına bakılmış ve bu değerler sırasıyla .915 ve .823 olarak hesaplanmıştır. Sonuç olarak; yapılan geçerlik ve güvenilirlik çalışması sonucunda spor alanında lisans öğrenimi gören öğrencilerin sporda sürdürülebilirliğe ilişkin tutumlarını ölçmek amacıyla geliştiren SSÖ'nün kullanılabilir bir ölçüm aracı olduğu tespit edilmiştir.

Anahtar kelimeler: Güvenirlilik, spor, sürdürülebilirlik, üniversite öğrencisi, geçerlik

Note: This research was studied at Turkish language and the English items need to conduct languages validity.

INTRODUCTION

In recent times, the concept of sustainability has become a multi-faceted examination, environmental debates in the international areas, in the areas of applied sciences and international policy issues (Falkenberg and Babiuk, 2014; Gulwadi, 2009; Huntzinger *et al.*, 2007). For the first time in 1987, the United Nations sponsored World Commission on Environment and Development-WCED published "Our Common Future" report, which defined sustainability, is expressed as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" [p.36] (WCED, 1987). While Rees (1988) defines the sustainability as providing positive change in any form without consuming the ecological, social, political systems that are dependents on community, Ding and Pigram (1995) stated as the process by which provides the realization of development without undergoing resources from destruction or damage. Goodland (1995) defined the sustainability as ensuring increasing social welfare by preserving resources of raw materials used for human needs.

The concept of sustainability, which is an interdisciplinary field of study sports science concerns with different dimensions. Sports, on one hand while helping to protect human health, on the other hand by providing people make sense as a social, cognitive and emotional development and contributes to shape the life to gain a sense of life (Kocak *et al.*, 2013; Steptoe *et al.*, 1996). Sports concept in this sense, which is the main purpose of sustainability, is one of the most important work area which will serve to cover "today's needs without blocking the ability of future generations to meet their own needs". The sustainability in the area of sports nowadays often emerges in implementation of sports policy (IOC, 2012; Mallen *et al.*, 2011). Sports are

possible to discuss as a lifestyle which accelerates the emergence of physical ability and mental ability and help individuals recover from the negative effects of daily life. When being looked from the social perspective, sports are known to strengthen people emotionally, to liven up social life description (Öztürk, 1998; Probert and Crespo, 2015). However, the benefits of sport to society are not required to assess only to people with health and social environment. There are both individual and social benefits such as providing economic benefits of sport, employment, being a source of prestige of the country, being a state policy, increasing recognition in the international arena in many ways. There are both individual and societal benefits providing economic benefits of sport, employment, being a source of prestige of the country, being a state policy, such as increasing recognition in the international arena in many ways (De Bosscher *et al.*, 2003). Therefore being sustainable sporting events is an important indicator in the country's wealth. The sustainability in sports which includes many elements is the notion of development.

To explain the sustainability in the area of sports due to lack of studies in sports, the theoretical support needed can be provided from other academic areas. In other disciplines there are important sources to explain the concept of sustainable development. For example, Lamberton (2005) has made the definition of sustainability that is a combination of ecological, economic and social concerns. This perspective has been used in some studies in the field of sports. Chernushenko *et al.*, (2001), in the sports facilities

management, Videira *et al.*, (2006) for the sport of golf tourism focused on the economic and environmental sustainability. Although economic and environmental issues are important for the development of sport, for the development of the sport at the center of policies and necessary practices for the sustainability of this approach is not appropriate to accept the focus of study (Lindsey, 2008). The definition made in other academic areas although it focuses on the social aspects of sustainability either implicitly or explicitly, the limited definitions are made usually (Fullan, 2005; Kelly *et al.*, 2005). With this narrow definition of the concept of sustainability in the field of sport is not enough to use. Therefore while Shediak-Rizkallah and Bone (1998) defined the sustainability in the sports, authors presented three alternative perspective (individual, social, organizational). Swerissen ve Crisp (2004) defined the sustainability according to the four different levels of social organization. The similarities between these categories are available. Therefore, while defining the sustainability in sport, the individual, social, organizational and institutional definitions are necessary. These definitions are listed below: (Lindsey, 2008).

Individual sustainability: It is the process of forming the long-term changes in attitude, talent, and / or behavior of individuals through participation in sports.

Social sustainability: It is the process of creating with the popularization of sport in terms of health and social behavior change in society.

Organizational Sustainability: It is the process of fulfilling its duties of the institutions which are responsible of the popularization of sport in the society.

Corporate sustainability: It is the process of making the appropriate arrangements with sport policies and practices, the changes in economic and environmental conditions by taking in a

comprehensive way in terms of the sports programs.

According to Lindsey (2008) if the concept of sustainability is defined in terms of the sport as including of these four conceptual definitions (individual, social, organizational and institutional) is expected to alleviate the problem. On the other hand, when is looked at the common sustainability literature to all scientific areas there are three basic components of sustainability. It is discussed in the first tema of the sustainability "as an economic dimension"; like competing with the world market, being met appropriately the people's basic needs, the applications raising the level of welfare. According to Castells (2000) the economic sustainability is the ability to provide resources and benefits. It is foreseen that the large financial obligations will not be left to future generations from this feature of the development process. Social sustainability is an approach that the competence of social services like education, health, equality of opportunity, social justice, gender equality and political accountability which can achieve this wide-system (Harris, 2000).

Many agreements, notices or agreements in the international arena see the sport as a tool for social sustainability. The most important of these are; United Nations Human Rights Universal Declaration-1948 (UDHR, 2010), Convention on the Rights of the Child-1989 (UN, 1989), Brighton (Women and Sport) Declaration-1994 (European Court of Human Rights in Brighton Declaration, 1994), Accept and Respect Declaration-2008 (IAPESGW, 2008) evaluate that sports is very important as a guide in the accessing on an equitable basis to all community members and social achievement in the provision of sustainability.

Topics discussed are shaped as the preventive, protective, curative, supportive activities which sport is also closely related to the "environmental and natural systems dimension". Depending on the topics discussed on the basis of these three dimensions, mutually supportive and complementary sustainability, intra-and inter-generational generations a balanced planning, implementation can be defined as the process of managing. However, in another model developed by the World Bank three sub-elements listed above as a fourth sub-elements 'corporate sustainability' was added (De Kruijf and Van Vuuren, 1998). Corporate sustainability is defined as that in order to create long-term value with social policies of institutions, economic, environmental and the activities of the institutions together with the corporate governance principles can be adapted to the decision-makers and the management of risk may arise from this issue (Wilson, 2003).

However today, almost as many countries the concept of sustainability, has been excluded from school curricula in areas beyond science and geography (Fien, 1993). Wortley (1994) also noted that, it is

METHODOLOGY

Participants

The study was carried out at Sakarya University and Ankara University. Ankara University School of Physical Education and Sports (1st, 2nd, 3rd, 4th, grade) including 43 students selected by random wrote the composition with sampling method for question pool. To avoid the same students to participate twice in the study were chosen two university. Sakarya University, School of Physical Education and Sport (SPES) which incorporates the department of physical education and sport teaching, sport management, coaching education and

almost never mentioned in physical education in sustainability. Physical education courses in many countries, including Turkey is accepted as the primary purpose of the physical activity and health but the concept of sustainability is ignored. The development of sports and the people who is studying in the areas of sports, considering to give direction to future sports events, in terms of promoting the sport in any country, the attitudes towards sustainability in sport is very important.

It was found that in the comprehensive literature review is "Sustainable Tourism Attitude Scale (SUS-TAS)" prepared in sustainability, the single attitude scale developed in 2005 by Choi and Sirakaya. In the presence of any attitude related to the sustainability in the area of sports scale reveals the importance of this article.

The purpose of this study is to develop Sustainability in Sport Scale (Sus-S) in order to determine their views on sustainability of the university students which is thought to specialize in sport-related professions in the field of sports.

recreation. Sakarya University SPES was chosen because this school contains all the sport departments. Before the questionnaire was applied, the necessary permission was obtained from the School of Physical Education and Sport of Sakarya University. In the literature, developing the scale is suggested to be taken the sampling of the order of 5 to 10 people for each item (Aiken, 1999). The signs of the sections in which students study, that covered sample was determined a random by using the sampling method. For reliability study of trial sample which has 64 items scale prepared, 320 students was thought to be sufficient to be covered. However, for being considered being a great deal of

students which will be useful for pre-test analysis, 350 forms were distributed, by subtracting incomplete and return the forms, the 125 women (38.3%), 201 men (61.7%) of 326 student volunteers were included in the sample. However, the dates between April 25 to May 15 2012 were collected. In the study, the students who attend preparatory classes and data collection tools are thought to be difficulty in filling stage, foreign students are excluded from the scope of the sample.

Demographics

The demographic characteristics of the students who participated in the study, it was found to be 38.3% female and% 61.7 of males, which forms 37.1% of 18-21 years of age, 53.6% of the 22-25 years of age, 9.2% of the age 26 and above. In addition, It has been identified that 22.6% in the Coaching Education, 24.2% in the Physical Education Teacher, 25.1% in the Recreation, 27.9% in the Department of Sport Management of the students studied.

Ethical Clearance

The required applications were submitted to the Sakarya University and the necessary permission was obtained. In addition ethics committee report was obtained from the Ethics Committee of Ankara University (Ethical Clearance Number: 193).

Instrument

Sustainability Scale in Sport (*Sus-S*): Before being created the question pool for *Sus-S*, a form of composition was prepared to have an idea about the opinions regarding the concept of sustainability to contribute in the creation of sentence. The related literature were used in the preparation of guiding questions in the form of composition (Carvalho, 2001; Chernuschenko *et al.*, 2001; Tainter, 2003; Choi and Sirakaya, 2005; Heck, 2005; Lindsey, 2008; Brymer, *et al.*, 2009; Girginov and Hills,

2009; Fyall and Jago, 2009; Reis and Higham, 2009, Smith, 2009; Mallen *et al.*, 2010a; Mallen *et al.*, 2010b, Koçak *et al.*, 2013). After being prepared the composition form, the opinions of two academicians have been taken in Department of Sports Management.

In this respect, all classes of Ankara University School of Physical Education and Sports (1st, 2nd, 3rd, 4th, grade) including 43 students selected by random wrote the composition with sampling method. Being evaluated by researchers the data obtained from the composition written, the expressions which might be the expression of attitudes are determined. At this stage, considering the dimensions of sustainability in sport in the study conducted by Koçak and *et al.*, (2013), preparing questions related to each sub-dimensions have been taken into consideration and the attitude sentences were prepared by taking help from the relevant literature. The matters which were held as sentence of attitudes were evaluated again by one academic specialist in the field of measurement and evaluation and in the preparation of materials and data collection done in the field of management of sport. It was consulted to the opinions of faculty member of the faculty of Physical Education and Sports College in determining the representing the desired area in accordance with the purpose of the expression of attitudes prepared. For this purpose, to determine whether any matter is related to sustainability in sports; by re-examining the attitudes expressed academicians four experts group in the fields of Sport Management, Physical Education and Sports, Sport and Recreation; evaluated in terms of language, scope and validity. For this purpose, a substance to determine if it is in sports related to sustainability; Sport Management, Physical Education and Sport, Sport and Recreation areas with a four-person group of academics, attitude,

reexamining expression; language, in terms of scope and validity were evaluated.

As a result of the evaluations, scale trial consisting of 64 of 33 positive, 31 negative, has emerged as 5 point likert-type scale. Positive attitude sentences on the trial scale were scored in a way, if students are joining completely the "5 points (4:20 to 5:00)," if they are joining "4 points (3:40 to 4:19)," if they agree moderately "3 points (2.60-3.39)", if they involve less "2 points (1.80 -2.59) ", if they do not agree at all " 1 point (1.00-1.79) " According to the scale developed the attitudes sustainability in sport of the students were divided into three groups as 1- Positive attitude (3.34 to 5.00), 2- Medium attitude (1.67-3.33), 3-low attitude (0.00-1.66).

Data Collection

The datas were collected between April 25 and May 15, 2012. Voluntary participation of students in the study were provided and were collected with permission from the instructor in charge of

RESULTS

Validity Study of Sus-S

Content Validity: It is appreciated under the content validity; whether each on the scale and the whole scale is convenient to the purpose of measuring, whether the area desired to measure is representative or not, whether it is dealing with the adopted problem or not and whether different concepts outside the area contain or not. This evaluation is being made by taking consideration into the assessment of experts in the subject. In this study, in order to contribute to the validity of the content of the Sus-S, the findings of the study made by Koçak *et al.*, (2013) in order to determine the extent of sustainability in sport were utilized and the suitable attitude expressions were

the lesson, the time of course was used in the first 15-17 minutes. As in filling stage of the data collection tools of the students attending to the preparatory classes are thought to be difficulty in the study, foreign students have been left outside the sample scope.

Analysis

In the study, in the analysis of the data obtained software packages statistical data analysis and LISREL 8.80 were used. İtem total correlations were used in order to provide evidence for the validity agent in the analysis of the data, analysis based on the difference of upside-down average was used to determine how the s forming the scale are contributing to the to the measurement tool. The Kaiser-Meyer-Olkin (KMO) and Barlett Sphericity test were used to determine the suitability of data for factor analysis. The confirmatory factor analysis (CFA) was used to determine the structure of factor. Cronbach Alpha ve Spearman Brown were used to determine evidence of the reability of this study.

determined by being writed the composition to the students studying in the field of sports and were consulted to the opinions of experts.

Construct Validity: The scale item total correlations were calculated for each to determine the construct validity of the 64 items on the scale trial by the method of substances based on correlation analysis. (Table 1) Being high correlation coefficient indicates that the relevant substance distinguishes individuals fluently. For item total correlation coefficient being below 30 shows that these substances reduce the reliability of the scale (Field, 2005). In the analysis, the correlation coefficient of the 21 items was found under 30 and it was decided to exclude these itemss from the scale.

Thus, the number of items was reduced to 43. When item total correlations of the 43 items were examined on the trial scale; with respect to the correlation coefficient between the items ($r = 0.30$ to 0.59) was found to be statistically significant difference ($p < 0.01$).

Then, an analysis of the items based on the difference in upside-down group average (27%) was performed to determine the relationship how much the items forming the scale contribute to the measurement tools. Calculated "t" and "p" values have been used as "resolving power coefficient" for scale items. ($p < 0.05$). According to the results of the analysis, a significant difference was found to be statistically between the values calculated for a 27% upside-down group "t" ($p < 0.01$). According to the results of this analysis, it is decided to not be leaved any items from the scale.

Factor Analysis

Exploratory Factor Analysis-EFA was made in order to learn about the basic dimensions about Sus-S, and to examine the reliability of materials and testing. Confirmatory Factor Analysis-CFA was made to test the accuracy of the factor

structure resulting with exploratory factor analysis.

Exploratory Factor Analysis-EFA:

Suitability for factor analysis of the data was examined by KMO Coefficient and Barlett Sphericity Test. For suitability to factor analysis of data from high KMO. 60 and the calculated chi-square of Bartlett's test value needs to be statistically significant. (Büyüköztürk, 2011). The sample coefficient of concordance (KMO). 91 and Barlett Sphericity Test χ^2 value was 6.139.91 ($p < .001$). The findings obtained from KMO coefficient and Barlett Sphericity Test showed that the studied sample size is sufficient and the data for factor analysis of is sufficient and is suitable for the analysis of showed that the factors. Rotation (varimax rotation) technique was used to determine the main variables. Büyüköztürk (2011), indicates that the patterns of factor loadings ranging between 0.30 and 0.40 can be taken as the lower cut-off point in the creation of factor. Accordingly, as a result of material removal from on the scale with two items whose load value factor is below 0.40, 3 items combined with other factors was included into the scale. The exploratory factor analysis results of Sus-S are given in Table 1.

Table 1. Item -total correlation of Sus-S and exploratory factor analysis results

Factors	Items	Load Factor	Item-total correlation	Variance (%)
Social	1-I don't think that doing sport and exercise is not a social need.*	,768	,597	14,37
	2-It isn't possible to create opportunities doing sport for all people from socio-economic sector.*	,710	,595	
	3-It can not be created sport and exercise in the social enviroment.*	,699	,578	
	4- Physical education and sports training enable that individuals are more sensitive to social event.	,689	,555	
	5-Increasing the number of people doing sport in the community avoids the violence societal events.	,675	,569	
	6-In the social responsibility projects (elderly, disabled, children, etc.) issued a tool.	,668	,585	
	7-I don't think that sport don't have an important part in the social circle.*	,668	,556	
	8- Given the opportunity todo sports for all sections of society, provides social justice.	,653	,575	
	9- All people have the right to participate in sporting activities	,555	,378	
	10- The aim of creating sport and recreation ares is to be improve the social life.	,497	,482	
	11- The population growth rate is more than eliminates equal opportunities in sport participation	,477	,359	
Individual	12- Sports participation develops the skills of individuals.	,692	,463	9,58
	13- I think that if the individuals don't have any healty problem, doing sport is a waste of time.*	,636	,469	
	14-Sport helps to form positive attitudes and behaviors in all areas of life in individuals.	,619	,495	
	15-I don't think that sport don't have an important place in our daily life.*	,597	,522	
	16- I think doing sports and exercise.	,581	,543	
	17- Sport is important for personality development.	,554	,358	
	18-I don't believe that the participation increases the quality of life.*	,417	,313	
19- The importance given to sports performance prevents the development of mass sports	,721	,550		
Participation	20-It is impotant to access to sports facilities to continue the sport and the exercise	,700	,506	9,42
	21-Carrying out efforts of dissemination is one of the state's responsibility.	,669	,483	
	22-Increasing awareness of living healthy in the comunity effects to the participation in sports.	,621	,484	
	23- The availability of sports areas increase to the participation in sports	,602	,575	
	24-The success of institutions governing the sports increase the rate of participation.	,480	,553	
Economic	25- Hosting major sports organizations provide the opportunity to urban development	,713	,433	8,19
	26-Great sports organizations harm to the economy of country.*	,639	,491	
	27-I support the sports activities by creating new industries which will provide job opportunities.	,630	,388	
	28-It is not possible to do the promoting the country with sports organizations.*	,535	,485	
	29-I believe that for the future of the sports industry our country needs to be host the prestigious sport organization.	,517	,320	
30- I don't think that improving the welfare of society in society will contribute to the development of sports industry*	,466	,395		
Organizational	31-Placing of sports culture in a country depends on a successful sports organization.	,768	,438	6,16
	32- I don't think that sports organization with international participation is necessary for being ensured the development of sports organizations.*	,732	,331	
	33- Ensuring continuity in the sport depends on the successful training of sports administrators with a good sports training.	,591	,549	
	34- The increasing success on the sports field depends on decisions in line with expectations of every segment of society.	,526	,336	
Enviromental	35- Sports and recreation facilities are damaging to the natural environment.*	,745	,370	5,71
	36- Physical education and sports training increase the environmental awareness.	,600	,348	
	37- The wildlife and natural habitats in sporting activities should be protected at all times in sporting activities in nature	,528	,328	
	38- Should adopt to the characteristics located in all kinds of sports facilities in the region should not damage to the habitat of living.	,514	,306	

* this sign refers to the negative sentence attitudes.

In the literature, the variance rates ranging from 40% to 60% are considered to be adequate (Field, 2005). The factors identified in this respect of is seen to be adequate. In this respect, the contribution to the total variance of the factors identified is seen to be adequate.

Confirmatory Factor Analysis-CFA: CFA was conducted to determine whether these variable groups consisting of six dimensions and contributing to these factors are represented or not with these factors. In CFA fit indices between theoretical model and the actual data to be revealed is recommended to be used many fit index values. (Marsh and Balla 1992, Frias and Dixon, 2005). Between these values; the most common used Chi-Square Goodness- χ^2 , Root Mean Square Residuals- RMR or RMS, Goodness of Fit Index-GFI, Adjusted Goodness of Fit Index-AGFI, Comparative Fit Index-CFI, Normed Fit Index-NFI, Root Mean Square Error of Approximation-RMSEA. RMR, GFI, AGFI, CFI, and NFI indices are acceptable for compliance value >0.90 and a perfect fit value is considered as >0.95 (Bentler, 1980; Marsh *et al.*, 2006). However, in the evaluation of the model fit $GFI>0.85$ and $AGFI>0.80$ fit index values acceptable level that researchers emphasized (Marsh and Balla 1992, Frias and Dixon, 2005) Harrington (2009) indicates that the approach of these values is also acceptable. The fit acceptable for RMSEA 0,08 and 0,05 are considered as perfect match value (Byrne and Campbell, 1999; Brown and Cudeck, 1993). For DFA is critical value N was calculated as 206.35. This case indicates in the study that the sample group consisting of 36 person used in the study is sufficient. Criteria CFA alignment results obtained are given in Table 2.

Table 2. The fit criteria for Measurement Model I

Compliance Measurement	Value	Compliance
χ^2/ sd	1,80	Perfect fit
RMSEA	0.050	Perfect fit
SRMR	0.052	Good fit
NFI	0.95	Perfect fit
NNFI	0.97	Perfect fit
CFI	0.98	Perfect fit
GFI	0.84	Rejection
AGFI	0.82	Rejection

In accordance with the findings obtained for Measurement Model II, it was decided that the sample data of the measurement model didn't show a strong compliance and by being used suggested correction index, Measurement Model II was passed. Accordingly, because of the three

s associated with more than one factor or latent structure, they are not included in the Measurement Model II. Thus, with the removal of 8th, 11th, 19th items 35 items remained in the measurement tool. (Table 3, Table 4).

Table 3. DFA results for Measurement Model II

Items	Standardized loads (λ)	t
1	0.43	15.50
2	0.44	15.25
3	0.49	14.33
4	0.54	13.39
5	0.53	13.63
6	0.51	13.91
7	0.49	14.34
9	0.78	8.63
10	0.71	10.04
12	0.55	13.08
13	0.56	12.88
14	0.55	13.07
15	0.49	14.17
16	0.44	14.99
17	0.65	11.00
18	0.80	8.04
20	0.46	14.81
21	0.58	12.60
22	0.53	13.46
23	0.39	16.16
24	0.36	16.77
25	0.59	12.19
26	0.49	14.03
27	0.60	11.97
28	0.55	12.82
29	0.68	10.36
30	0.63	11.31
31	0.43	14.21
32	0.62	11.02
33	0.49	13.25
34	0.72	9.34
35	0.61	11.05
36	0.71	9.33
37	0.76	8.36
38	0.66	10.24

Table 4. Compliance criteria for Measurement Model II

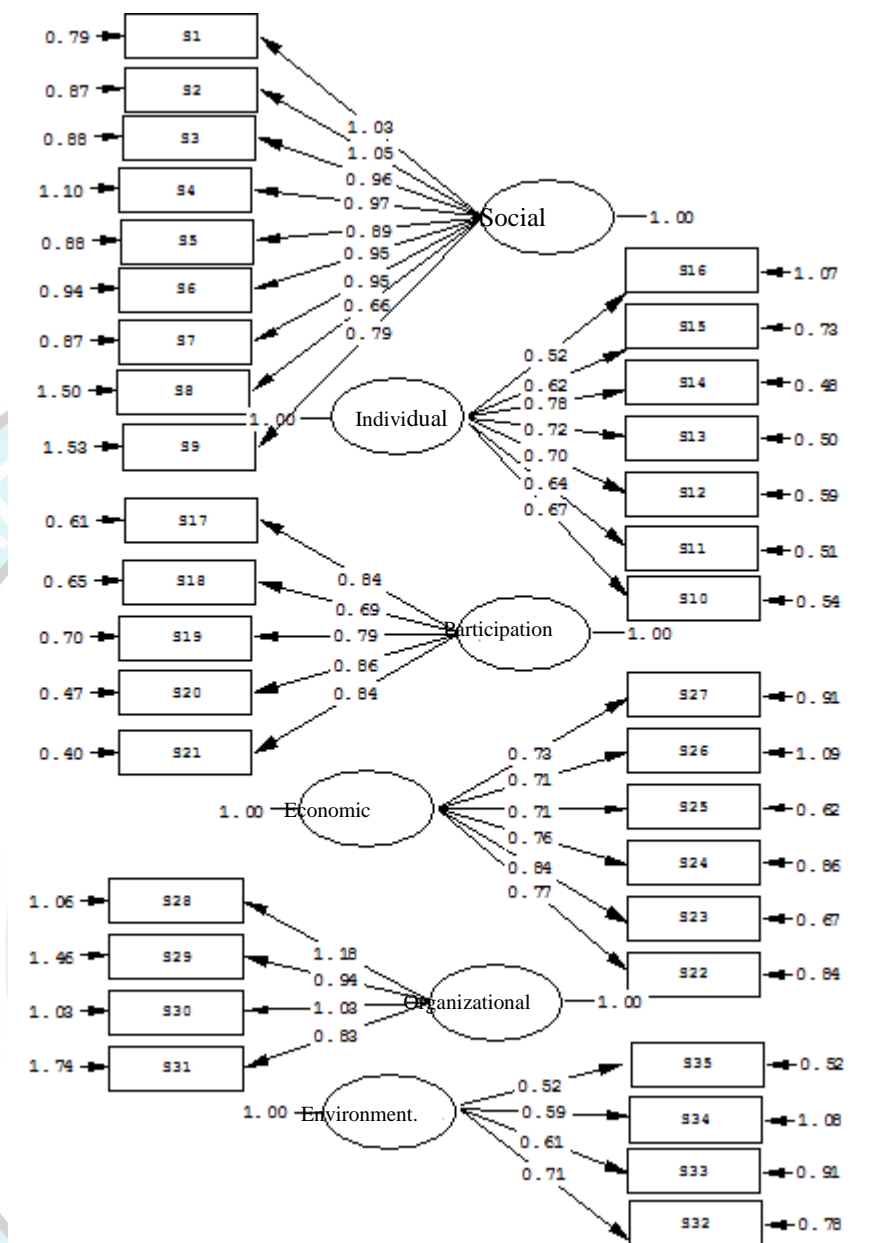
Compliance Measurement	Value	Compliance
χ^2/ sd	1,61	perfect fit
RMSEA	0.044	perfect fit
SRMR	0.049	perfect fit
NFI	0.95	perfect fit
NNFI	0.98	perfect fit
CFI	0.98	perfect fit
GFI	0.87	Acceptable fit
AGFI	0.85	Acceptable fit

The Measurement Model II is defined as a result measurement model. When being analyzed the compliance criteria given in Table 4, it indicates that RMSEA, SRMR which are descriptive eligibility criterias; NFI, NNFI, CFI, GFI which based on the model comparison, AGFI Measurement Model II are appropriate models.

Accordingly, The model was accepted by determining that the confirmatory factor analysis findings for the 35 items in the

Measurement Model II that the six factors are thought to explain, is equal to the observed variance-covariance matrix. In Figure 1, the relationship is shown between the factors involved in the model, and the items in these factors. When being looked to the calculated correlation coefficients of the relationship between the factors and their items, it was seen that this value is greater than .30 for all items observed. It is significant on the

level .01 the relationship of these observed factor-item.



Chi-Square=880.51, df=545, P-value=0.00000, RMSEA=0.044

Figure 1: Measurement Model II DFA, the relationship of factor-item

Results Concerning with the Reliability of the Scale

Spearman-Brown internal consistency coefficient is 823 and Guttman internal consistency coefficient is 846 calculated

with the separation into two distinct and equal parts of the test for Sus-S. Its being high the reliability in this coefficient is indicative that the items of the scale are consistent with each other, at the same time is the indicator of validity. The results

of Cronbach's Alpha shown in Table 5 indicate that the internal consistency coefficient of the whole of the scale and

all the sub-dimensions of the scale is over 70.

Table 5. Internal consistency coefficients related to the dimensions of Sus-S

Internal consistency coefficients related to the dimensions of Sus-S	Cronbach's alpha (Cr μ)
internal consistency coefficient for the whole Sus-S	.915
1. Social	.859
2. Individual	.804
3. Participation	.803
4. Economic	.701
5. Organizational	.736
6. Environmental	.713

As a result, It has been concluded in the framework of the reliability and validity analysis made the measurements used to

obtain data about the research of model are very reliable y is provided the discriminative validity.

DISCUSSION AND CONCLUSION

Sus-S consists of 23 positive, 12 negative, 35 items and 6 subscale. There are 9 items in the social sub-dimension, 7 items in the individual sub-dimension, 5 items in the participation sub-dimension, 6 items in economy sub-dimension, 4 items in enviromental sub-dimension, 4 items in organization sub-dimension. The lowest total score which can be taken from Sus-S is 35 and the highest total score which can be taken is 175.

By making use of the findings referred to in a study made by Koçak *et al.*, (2013), by being writing composition to the students, creating appropriate attitudes statements and resorting to the expert opinion about the scale have been important factors in ensuring the validity of the content. When being taken into account load factors which belong to the items in sub-dimension and the rate of explained variance, it can be said tha the measurement tool is structurally valid. With the aim of reveal what level is able to measure the characteristics of each items in the measurement tool, item-total correlations and the analysis based on the average difference for 27 % upper-lower group were conducted. Accordingly, 21 items were removed from the scale.

The sample coefficient of concordance done in order to determine the suitability of an exploratory factor analysis was found as (KMO). 91 and Barlett Sphericity Test .91 ($\chi^2 = 6.139$ ($p < .001$)). Results obtained from KMO coefficient and Barlett Sphericity test shows to analyze the factor that studied sample greatness is sufficient and datas is convenient for the factor analysis. Initially, according to the results after the rotation of the scale drafts consisting of 43 items by being removed with 2 items whose load factor value is 0.40 and 3 items boarding with the others the scale was reduced to 38 items.

As a result of the exploratory factor analysis, six-factor structure has been revealed. The total variance explained six factors is 53.466%. The factors identified in this respect of the contribution to the total variance is seen to be adequate. This result shows that the items of the scale measure the same size as they do, their attitudes of the students towards the sustainability in sport can measure. In the research results of EFA, Sus-S consisting of six dimensions of factors that contribute to these factors with variable groups underrepresented DFA is made to determine. DFA was done to determine whether these variance groups contributing in Sus-S consisting of six

dimensions are being represented with these factors or not. For DFA the critical value of N was calculated as 206.35.

This case study used a sample of 326 indicates that the group is sufficient. The suitability of the obtained models, tested with consensus criteria, by being removed 3 items from the scale, 35 items scale was finalized. When being considered confirmatory index values GFI and AGFI although there appears to be somewhat lower, at all the fit indices, including χ^2/sd ratio have been found to fit perfectly. In the reliability analysis made has been found to be reliable the whole scale and all sub dimension. In the literature Scale Assessing Residents' Attitudes Toward Sustainable Tourism-SUSTAS which is the single scale by Choi and Sirakaya (2005) improved on sustainability consists of 44 items and 7 sub-dimensions. The sub-dimensions were defined as respectively perceived social costs, environmental sustainability, long term planning, and perceived economic benefits, community-based economics, the provision of visitor satisfaction, increasing of community participation. In this regard, the designated sub-dimensions are similar to the sub-dimensions of this study. By being re-examined using confirmatory factor analysis of SUSTAS were made by Chia-Pin *et al.*, (2011). After the analysis of the

scale the construct validity and internal consistency has been found to be protected with seven sub-dimensions and 27 items of the scale. However, in this study being used both exploratory and Confirmatory Factor Analysis of the construct validity and internal consistency of the scale increase.

Some limitations of this study should be noted. The most important limitation of this study was, the data were collected only from the Sakarya University. The scale was applied to a convenience sample of students in order to prevent the limitation of generalizability of the results. Sus-S is the only valid scale for university students who studying the sport department. The scale reliability of Sus-S was made and can be applied to coaches, referees, athletes and sports scientists. The scale will be applied to the students who studying outside the sports field. In this scale that can be investigated the impact on sustainability attitudes for studying the departments of sport.

As a result, the findings related to the reliability and validity of the scale shows that Sus-S is utilized to determine the views of students studying of university on the sports field about sustainability in sport.

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