Validity and Reliability of the Survey of Personal and Social Development with Turkish University Students[+]

Türk Üniversite Öğrencileri Üzerinde Kişilik ve Sosyal Gelişim Envanteri'nin Geçerlik ve Güvenirliği

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Abstract

The aim of this study was to examine the psychometric properties of a Turkish version of the Survey of Personal and Social Development (SPSD) with a sample of young adults (n = 340) attending university in İzmir. The author evaluated the applicability of the Turksih SPSD by examining specifically its internal consistency, and construct validity. Findings suggest that the Turksih SPSD is a valid and reliable instrument and SPSD is appropriate for assessing risk and protective factors related to problem behaviors for young adults.

Key words: Problem behaviors; Risk factors; Protective factors; Reliability; Validity.

Özet

Bu çalışmanın amacı Kişilik ve Sosyal Gelişim Envanteri'nin (KSGE) Türkçe formunun psikometrik özelliklerini değerlendirmektir. Araştırmanın örneklemini 340 üniversite öğrencisi oluşturmaktadır. KSGE'de Kişilik Sistemi, Algılanan Çevre Sistemi ve içerisinde Problem Davranışlar İndeksi ve Sağlığa Yönelik Davranışlar İndeksi yer alan Davranış Sistemi olmak üzere üç yapı bulunmaktadır. Her bir sistemin geçerlik ve güvenirlik çalışması ayrı ayrı yapılmıştır. KSGE'nin geçerlik ve güvenirlik çalışması kapsamında açıklayıcı faktör anaalizi ile yapı geçerliği incelenmiş daha sonra doğrulayıcı faktör analizi ile elde edilen yapı test edilmiştir son olarak da her bir ölçeğin Cronbach alpha güvenirlik katsayıları hesaplanmıştır. Bu analizler sonucunda elde edilen bulgular 11 faktörden oluşan Kişilik Sistemi, 13 faktörden oluşan Algılanan Çevre Sistemi, 4 faktörden oluşan Problem

Davranışlar İndeksi ile 4 faktörden oluşan Sağlıklı Davranışlar İndeksi'nin Cronbach alpha güvenirlik katsayıların ölçeğin orijinalinden elde edilen değerlere büyük oranda benzerlik gösterdiğini ortaya koymaktadır. Sonuç olarak KSGE'nin üniversite öğrencilerinde problem davranışları ve bu davranışlarla ilişkili risk ve koruyucu faktörleri değerlendirmede uygun bir ölçme aracı olduğu düşünülmektedir.

Anahtar kelimeler: Problem davranışlar; Risk faktörleri; Koruyucu faktörler; Geçerlik; Güvenirlik.

Problem behaviors described as a behavior that is socially defined as a problem, as a source of concern, or as a undesirable by the social and or legal norms of conventional society and its institutions of authority; it is behavior that usually elicits some form of social control response, whether minimal, such as a statement of disapproval, or extreme, such as confinement in prison (Jessor, Donovan, & Costa, 1991). Problem behaviors increased in adolescence period and it is seen that intensity of these behaviors go increasing in later years of life (RAND, 2003). The greater inolvement in problem behaviors in adolescence the gretaer the involvement in problem behavior in young adulthood (Jessor et al., 1991).

Young adulthood, between the end of adolescence and the beginning of midlife, is characterized by (a) the completion of previous developmental tasks and (b) the initiation of new life experiences (Beaty, 2002; Hawkins, Oesterle, & Hill, 2004). Formation of significant personal relationships, more advanced cognitive functioning, completing school, entry into work and career, improved moral/ethical reasoning, getting married, and becoming a parent are considered key markers of young adulthood. Being able to successfully navigate these new experiences ensures that young adults will complete this developmental period and move smoothly into middle adulthood. Failure to make appropriate developmental progress puts them at risk for the remainder of their life journey (Beaty, 2002). According to Shope, Bingham, & Little (2008) young adults have the highest rates of at-risk drinking/driving of any age group. Similiarly studies showed that a high degree of risk-taking in the use of alcohol, tobacco, and drugs (and driving under the influence) and involvement in delinquent/criminal activity peak and desist in this age period (Hawkins et al., 2004; Ahlin & Augustino, 2008).

In Turkey, studies which about prevelance of problem behaviors and related to risk and protective factors among young adults are limited. Although some of the these studies evaluated prevelance of smoking or drinking alcohol, they did not evaluated comprehensively risk and protective factors related to young adults' problem behaviors. So, it is needed to a questionnaire which is reliable and valid to evaluate the present situation and to develop effective prevention and intervention of these behaviors.

To gain a deeper understanding of the specific problem behaviors of young adults, Survey of Personality and Social Development (SPSD), was developed. SPSD is consisted of a number of psychometrically developed measures designed to

assess the Personality, Perceived Environment, and Behavior System variables of Problem Behavior Theory (Jessor et al., 1991). The personality system variables are made up of a person's attitudes, beliefs and motivations about a given behavior or set of behaviors. The variables in the Perceived Environment System, aspects of the environment as constituted out of experience with it, and they reflects its socially organized dimensions of potential meaning or significance. The Behavioral System variables consists of problem behaviors, including smoking, alcohol misuse, illicit drug use, and health enhancing behaviors such as risky driving and attention to healthy diet.

The aim of the this study was to examine the reliability and validity of the Turkish version of the SPSD.

Method

Participants

The participants consisted of 340 students ($\Gamma = 234$, $B = 106$) from Grades 1 through 5 in Dokuz Eylul University in Turkey. A total of 84 (24.7%) participants from first grade, 76 (22.4%) participants from second grade, 65 (19.1%) participants from third grade, and 115 (33.8%) participants from fourth and fifth grade were recruited for the study.

Instruments

Survey of Personal and Social Development

Survey of Personal and Social Development included well-established measures of broad range of theoretically derived psycho-social and behavioral risk and protective factors as well as problem behaviors (Jessor et al., 1991; Jessor, Turbin, Costa, Dong, Zhang, & Wang, 2003; Jessor, Costa, Krueger & Turbin, 2006). In the SPSD, psycho-social and behavioral risk and protective factors assessed in the three systems: Personality System, Perceived Environment System, and the Behavior System.

Measures of the Personality System

This system contains 53 questions and yields a eleven subscale profile of scores: Value on Academic Achievement, Value on Health, Expectation for Academic Achievement, Attitude toward School, Perceived Life Chances, Religiosity, Self-esteem, Depression, Attitudinal Intolerance of Deviance, and Impulsivity. Each scale describes a certain aspects of personality and five of them related risk factors and six of them related protective factors (Table 1).

Table 1

Description of Subscales in Personality System

Subscales	Description	No. Of Items	Cronbach's alpha*
Value on Academic Achievement	Assesses personal importance of academic life	4	.74
Value on Health	Assesses importance of health	5	.89
Expectation for Academic Achievement	Assesses anticipated outcomes in academic life	4	.87
Attitude toward School	Assesses level of aggrement with a series of statements related to school	3	.75
Perceived Life Chances	Assesses anticipated outcomes in various life areas such as family life and career	7	.87
Religiosity	Assesses the importance to the respondent of religious teachings, beliefs, and counsel for the direction of daily life	4	.94
Self-esteem	Measures beliefs about one's abilities and attributes in different domains, including social competence, academic skills, and attractiveness	6	.71
Depression	Measures feelings of depression in the last six months	4	.90
Stress	Measures of the extent to which respondents perceived the different areas of lives as being stressful	4	.90
Attitudinal Intolerance of Deviance	Assesses the perceived "wrongness" of various deliquent type behaviors, including theft, property damage, and physical agression	7	.83
Impulsivity	Assesses the perceived "rightness" of various impulsive behaviors	5	.68

* Jessor et al., 1991; Jessor, Costa, & Turbin, 2003

Measures of the Perceived Environment System

This system contains 61 questions and yields a fifteen-subscales profile of scores: Friends Controls against Problem Behavior, Friends Disapproval of Problem Behavior, Friends Model for Problem Behavior, Friends Model for Conventional Behavior, Friends Model for Health Enhancing Behavior, Peer

Pressure to Drink, Parent/Friends Compatibility, Parent Models for Health Enhancing Behavior, Parental Disapproval of Problem Behavior, Parent Support, Family Closeness, Student Disapproval of Risk Behavior, Student Approval of Conventional Behaviors, Student Models for Risk Behavior, and Teacher support.

Table 2
Description of Subscales in Perceived Environment System

Subscales	Description	No. Of Items	Cronbach's alpha*
Friends Controls against Problem Behavior	That is concerned not only with the likelihood that friends would try to influence them if they are going to do something illegal, but also with the level of approval or disapproval friends showed if the respondent actually did something most people would thing wrong	4	.65
Friends Disapproval of Problem Behavior	Measures perception of the disapproval among friends for engaging in the various problem behaviors such as smoking, drinking, and marijuana use	3	.75
Friends Model for Problem Behavior	Measures perceived models among friends for cigarette smoking, alcohol use, and marijuana use	5	.72
Friends Models for Conventional Behavior	Assesses the proportion of the friends who take part in conventional activities such as social clubs and volunteer work	5	.63
Friends Models for Health Enhancing Behaviors	Assesses the proportion of the friends who take part in healthy activities such as healthy diet and physical exercise	5	.64
Peer Pressure to Drink	Assesses perceived peer pressure to smoke and drink alcohol	2	.76
Parent/Friends Compatibility	Perceived aggrement between parents and friends regarding what is important in life, the kind of person one should become, and what one should be doing with one's life	3	.72
Parent Models for Health Enhancing Behavior	Encompassing perceptions of parents' behavior with regard to eating, sleeping, exercise, and seat belt use	8	.71
Parental Disapproval of Problem Behavior	Measures perception of the disapproval among parents for engaging in the various problem behaviors such as smoking, drinking, and marijuana use	3	.75
Parent Support	Measures perceived support from parents	3	.80

Family Closeness	Assessing the respondents' relationship with parents	3	.84

Table 2 Continued

Subscales	Description	No. Of Items	Cronbach's alpha*
Student Disapproval of Risk Behavior	Measures perception of the disapproval among students for engaging in the various problem behaviors such as smoking, drinking, marijuana use, and deviant behaviors	7	.72
Student Approval of Conventional Behaviors	Measures perception of the approval among students for engaging in the various convetional behaviors such as take a leadership and help other students	4	.75
Student Models for Risk Behavior	Assesses social models for substance use and deviant behaviors among student in school setting	4	.58
Teacher Support	Measures perceived support from teachers	2	.76

* Jessor et al., 1991; Jessor, Turbin, & Costa, 1997; Jessor et al.,1998; Jessor et al., 2003.

Measures of the Behavior System

Two different measures of variables from the Behavior Strucure were included in the SPDQ. These are; *Multiple Problem Behavior Index* and *Health-enhancing Behaviour Index.*

Table 3 Description of subscales in Behavior System

Subscales	Description	No. Of Items	Cronbach's alpha*
Multiple Problem Behavior Index:	In the problem behavior structure four separate areas of young adult problem behavior are specified: problem drinking, marijuana and other illicit drugs use, smoking, and delinquent behaviors. In addition, there is an index that summarizes the degree of multiple involvement across those five behaviors.	*4*	.60 to .80
Health-Enhancing Behaviour Index (HEBI):	HEBI was computed by totalling four subscales, including regular physical activity, risky driving, seat belt use, attention to healthy diet. Higher scores denote higher levels of health-enhancing behaviours.	*3*	.60 to .80

* Jessor et al., 1998; Jessor et al., 2003.

Turkish version of the SPSD*:* The Turkish version of the SPSD was developed by using the back-translation method. Back translation was maintained through the procedure described by Brislin's (1970) classic back-translation model. First, the original version was translated into Turkish by a bilingual Turkish psychological counselor, and then cross-translation was performed by a second bilingual psychological counselor who had not seen the original items. This back-translation was then compared with the original version to detect any discrepancies and the scale was completely identical to the original version.

Procedure

Students were informed about the main goal of the research, anonymity, and voluntary participation. The questionnaires were self-administered under close supervision by researcher. Students filled out questionnaires during the class period. The questionnaires took approximately 50-60 minutes to complete.

Data Analysis

Exploratory factor analysis was conducted, with principal components analysis as the method of factor extraction, to identify the underlying factor structure of the SPSD. Moreover, factors provided by the exploratory analysis were evaluated using a confirmatory factor analysis. And to evaluate the reliability of the Turkish version of the SPSD with our sample, it was examined the internal consistency. Corrected item-total correlations and Cronbach's alpha coefficients were computed for the total scale and subscales. These analysis were repeated for each of the three systems (Personality System, Perceived Environment System, and Behavior System). SPSS 11.0 for Windows was used to perform statistical analysis.

Results

Validity

Validity is defined as the extent to which an instrument measures what it was intended to measure (Naughton, Shumaker, Anderson, & Czajkowski, 1996). In this study, factor structure of the subscales in Personality System, Perceived Behavior System, and Behavior System was analysed separately. In order to determine the factor structure of the Personality System, Perceived Behavior System, and Behavior System, exploratory factor analysis were applied. The following criteria were considered to hold the items in the scale: (a) according to the results of varimax rotation, the items should be in only one factor with a factor load of .40 or above (Coombs & Schroeder, 1988); (b) if an item appears in more than one factor, the difference between two loadings should be at least 0.10.

Factor Structure of Subscales in Personality System

The Kaiser-Meyer-Olkin measure of sampling adequacy of the subscales in the Personality System, at 0.75. At the same time the Bartlett test of sphericity was also acceptable (p<.001), indicating that items in the Personality System were

interdependent (x^2=3190.57, df=1128, p<.001). These two measures of psychometric adequacy suggested that the subsclaes in the Personality System correlation matrix was suitable for factor analysis. The examination of the factor structure of the subscales in the Personality System was started with exploratory factor analysis by using principal component analysis with varimax rotation. Because, subscales were minimally related empirically, consistent with their conceptual orthogonality (Costa, Jessor, & Turbin 2007).

The analysis produced a eleventh-factor model (eigenvalues > 1.0 as a criterion), which accounted for 60% of the total variance, Expectation for Academic Achievement, Value on Health, Attitude toward School, Religiosity, Depression, Stress, andImpulsivity loaded mainly on their own factors, but one Self-esteem item and two Attitudinal Intolerance of Deviance items loaded on another factor. At the same time, factor loadings of two items (one Value on Academic Achivement item and one Perceived Life Chances item) less than .40. Therefore, these five items were eliminated the Turkish form of SPSD and the exploratory factor analysis was repeated. When a eleventh-factor solution was carried out, the items loaded mainly on their own factors. The items had a factor loading >⬜0.40 on their factors.

This solution accounted for 62.3% of the total variance. The first factor was labelled Stress and item loadings ranged from .49 to .71. The second factor was labelled Depression and item loadings ranged from .61 to .67. The third factor was labelled Perceived Life Chances and item loadings ranged from .62 to .74. The fourth factor was labelled Religiosity and item loadings ranged from .77 to .85. The fifth factor was labelled Value on Academic Achievement and item loadings ranged from .78 to .80. The sixth factor was labelled Attitude toward School and item loadings ranged from .43 to .55. The seventh factor was labelled Self-esteem and item loadings ranged from .44 to .69. The eighth factor was labelled Value on Health and item loadings ranged from .58 to .78. The nineth factor was labelled Expectation for Academic Achievement and item loadings ranged from .61 to .77. The tenth factor was labelled Impulsivity and item loadings ranged from .52 to .79. And the eleventh factor was labelled Attitudinal Intolerance of Deviance and item loadings ranged from .41 to .84.

The factor loadings for each subscales in the Personality System are presented in Table 5. Exploratory factor analysis revealed that subscales in the Personality System of the Turkish version of SPSD is same factor structure as the original form.

Factors provided by the principal component analysis were evaluated using a confirmatory factor analysis (CFA). LISREL 8.51 was used to analyze the 48 items. A covariance matrix was used as input data and the method of estimation was maximum likelihood. In CFA, four practical fit indexes were used to evaluate the adequacy of the model tested: (1) the goodness-of-index (GFI) such that 0.90 to 0.95 indicates a acceptable fit, (2) the adjusted goodness-of-fit index (AGFI) such that 0.85 or above indicates a good fit, (3) the standardized root mean-square residual (SRMR) such that value less than .05 indicates a good fit and values as high as 0.08 are deemed acceptable and (4) acceptable ratio for Chi- Square/degrees

of freedom (X^2/df) between 2 to 5 provides a acceptable fit (Byrne, 1998; Hu and Bentler, 1999; Yılmaz & Çelik, 2009). For the Personality System, CFA indicated

Table 5

Factor loadings of Personality System Subscales

Items	Factors										
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
167	.71										
165	.66										
164	.61										
166	.49										
171		.67									
170		.66									
168	.	.64									
169		.61									
268			.74								
270			.70								
269			.69								
271			.67								
267			.66								
266			.62								
139				.85							
140				.83							
137				.78							
138				.77							
102					.80						
103					.79						
104					.78						
108						.55					
106						.48					
107						.43					
29							.69				
33							.62				
30							.54				
32							.47				
35							.44				
3								.78			
5								.73			
4								.67			
2								.61			
1								.58			
303									.77		
304									.72		
305									.63		
306									.61		
281										.79	
282										.72	
283										.63	
280										.54	
279										.52	
182											.84
183											.70
185											.51
186											.56
184											.41
% of variance	7.67	6.71	6.37	6.36	5.80	5.66	5.57	5.20	4.74	4.41	3.83

Note: 1=Stress, 2= Depression, 3= Perceived life chances, 4= Religiosity, 5= Value on Academic Achievement, 6= Attitude toward School, 7= Self-esteem, 8= Value on Health, 9= Expectation for Academic Achievement, 10= Impulsivity, 11= Attitudinal Intolerance of deviance

that the eleven-factor model fit the data acceptable: X^2=3594,50, df=992, p<.001; X^2/df=3.62; GFI=0.91; AGFI; .89; SRMR=0.07.

Factor Structure of Subscales in Perceived Environment System

The Kaiser-Meyer-Olkin measure of sampling adequacy of the subsclaes in the Perceived Environmet System, at 0.65. At the same time the Bartlett test of sphericity was also acceptable (*p*<.001), indicating that items in the Perceived Environment System were interdependent (x^2=□7359, df=1176, p<.001). These two measures of psychometric adequacy suggested that the subscales in the Perceived Environmet System correlation matrix was suitable for factor analysis. The examination of the factor structure of the subscales in the Perceived Environmet System was started with exploratory factor analysis by using principal component analysis with varimax rotation and an unlimited number of factors. Because, subscales were minimally related empirically, consistent with their conceptual orthogonality (Costa, Jessor, & Turbin 2007).

The analysis produced a sixteen-factor model (eigenvalues >1.0 as a criterion), which accounted for 60% of the total variance. In the Family Closeness, Parent Support, Student Approval of Conventional Behaviors, Teacher Support, and Student Model for Risk Behavior Subscales items loaded mainly on their own factors but, one Student Disapproval of Risk Behavior item, one Friends Model for Conventional Behavior item, one Friends Model for Problem Behavior item and two Friends Model for Health Enhancing Behavior and Parent Models for Health Enhancing Behavior items also loaded on another factor. At the same time, factor loadings of three items (one Friends Disapproval of Problem Behavior item, one Parent / Friend Compatibility item, one Friends Control Against Problem Behaviors item) less than .40. Therefore, these ten items were eliminated the Turkish form of SPSD. On the other hand two subscales (Peer Pressure to Drink and Parent Disapproval of Problem Behaviors) items were not loaded on their factors. So these subscales excluded the Perceived Environment System variables.

The exploratory factor analysis was repeated, but the number of factors was set to thirteen. When a thirteen-factor solution was carried out, the items loaded mainly on their own factors. The items had a factor loading >□0.40 on their factors. This solution accounted for 66.2% of the total variance (Table 3). The first factor was labelled Student Disapproval of Risk Behavior and item loadings ranged from .65 to .82. The second factor was labelled Parent Models for Health Enhancing Behavior and item loadings ranged from .42 to .79. The third factor was labelled Family Closeness and item loadings ranged from .76 to .83. The fourth factor was labelled Parent Support and item loadings ranged from .65 to .77. The fifth factor was labelled Student Approval of Conventional Behavior and item loadings ranged from .60 to .75. The   sixth factor was labelled Parent / Friend Compatibility and item loadings ranged from .71 to .75. The seventh factor was

labelled   Friends Model for Conventional Behavior and   item loadings ranged from .44 to .79. The eighth factor was labelled Teacher Support and item loadings
Table 6

Factor loadings of Perceived Environmet System Subscales

Items	Factors												
	1	2	3	4	5	6	7	8	9	10	11	12	13
129	**.82**						.11						
128	**.78**										.11		.13
132	**.71**												
126	**.71**												
136	**.67**			.16									
131	**.65**		.11										
196		**.79**											
198		**.76**			.12								
202		**.73**								.13			
200		**.70**											
201		**.49**											
199		**.42**	.19										
189			**.83**	.14									
190			**.77**										.11
188			**.76**										
192		.17		**.77**									
191				**.72**									
193				**.65**									
127				.18	**.75**								
135					**.74**								
130					**.66**								
133					**.60**	.13							
156						**.75**							
155						**.72**							
154						**.71**							
148							**.79**						
146							**.60**						.11
147				.12			**.54**						
149							**.44**						
110								**.85**					
109						.10		**.80**			.15		
290									**.85**				
289			.14						**.78**				
244									**.56**				
92									**.40**				
157													
158													
159										.11			
307				.11						**.79**			
308										**.67**			
151					.11						**.77**		
144											**.75**		
150											**.40**		
249												**.78**	
96												**.48**	
120												**.41**	
243													**.78**
91						.11							**.56**
% of variance	6.84	5.98	5.27	4.92	4.90	4.85	4.14	4.11	3.78	3.65	3.46	3.39	3.30

Note: 1= Student Disapproval of Risk Behavior, 2= Parent Models for Health Enhancing Behavior, 3= Family Closeness, 4= Parent Support 5= Student Approval of Conventional Behaviors, 6= Parent / Friend Compatibility, 7= Friends Model for Conventional Behaviors, 8= Teacher Support, 9= Friends Model for Problem Behavior, 10=

Student Model for Risk Behavior, 11= Friends Model for Health Behavior, 12= Friends Control Against Problem
Behaviors , 13= Friends Disapproval of Problem Behavior

ranged from .80 to .85. The nineth factor was labelled Friends Model for Problem
Behavior and item loadings ranged from .40 to .85. The tenth factor was labelled
Student Model for Risk Behavior and item loadings ranged from .67 to .79. The
eleventh factor was labelled Friends Model for Health Enhancing Behavior and
item loadings ranged from .40 to .77. The twelveth factor was labelled Friends
Control Against Problem Behavior and item loadings ranged from .41 to .78. The
thirteenth factor was labelled Friends Disapproval of Problem Behavior and item
loadings ranged from .56 to .78.

Factors provided by the principal component analysis were evaluated using a
confirmatory factor analysis (CFA). For the Perceived Environment System, CFA
indicated that the thirteen-factor model fit the data acceptable: X^2=319.11, df=92,
p<.001; X^2/df=3.46; GFI=.91; AGFI; .87; SRMR=0.07.

Factor Structure of Subscales in Behavior System

In Behavior System as a *Multiple Problem Behavior Index(MPBI)* and *Health-
enhancing Behaviour Index(HEBI)* two different index are included. So factor
structure of these indexes were examined separately.

Factor Structure of Multiple Problem Behavior Index

The Kaiser-Meyer-Olkin measure of sampling adequacy of the subsclaes in the
Multiple Problem Behavior Index, at 0.78. At the same time the Bartlett test of
sphericity was also acceptable (*p*<.001), indicating that items in the MPBI were
interdependent (x^2 =□4516, df=120, p<.001). These two measures of psychometric
adequacy suggested that the subsclaes in the MPBI correlation matrix was suitable
for factor analysis.The examination of the factor structure of the subscales in the
MPBI was started with exploratory factor analysis by using principal component
analysis with oblique rotation. Because, subscales were related empirically (Costa,
Jessor, & Turbin 2007).

The analysis produced a four-factor model (eigenvalues > 1.0 as a criterion),
which accounted for 68.% of the total variance. Smoking, Problem Drinking,
Marijuana and Other Illicit Drug Use and Delinquent Behaviors items loaded
mainly on their own factors. Two items have less than .40 factor loadings.
Therefore, these items was eliminated the Turkish form of MPBI.

The exploratory factor analysis was repeated, and the number of factors was set
to four. When a four-factor solution was carried out, the items loaded mainly on
their own factors. The items had a factor loading 0.40 on their factors. This
solution accounted for 70.6% of the total variance. The factor loadings for each
subscales in the MPBI are presented in Table 4. The first factor was labelled
Problem Drinking and item loadings ranged from .80 to .92. The second factor
was labelled Marijuana and Other Illicit Drug Use and item loadings ranged

from .44 to .87. The third factor was labelled Smoking and item loadings ranged from .79 to .95. The fourth factor was labelled Delinquent Behaviors and item loadings ranged from .41 to .87. Exploratory factor analysis revealed that subscales in the Turkish version of MPBI is same factor structure as the original form.

Table 7
Factor Structure of Multiple Problem Behavior Index

Items	Factor Loadings			
	1	2	3	4
222	.92	.17		
224	.90			
225	.85			
219	.84			
223	.84			.14
221	.83			
226	.81			
220	.80			
296		.87		
295		.85		
297		.85		
298		.84		.13
299		.79		
300		.71		
301		.55		
286		.48		.61
294	.12	.44		
61			.95	
62			.93	
64	12		.92	
63	.10		.90	
65			.87	
66			.79	
272		.22		.87
275				.86
274				.79
276				.72
273				.65
277				.64
278			.13	.41
% of variance	21.21	18.19	16.65	14.02
	Total of variance= 70.06%			

Note: 1= Student Disapproval of Risk Behavior, 2=Illicit Drug Use, 3= Smoking, 4= Anti-social Behaviors

Factors provided by the principal component analysis were evaluated using a confirmatory factor analysis (CFA). For theMultiple Problem Behavior Index, CFA indicated that the thirteen-factor model fit the data acceptable: X^2=624.50, df=258, p<.001; X^2/df=2.41; GFI=.95; AGFI; .93; SRMR=0.05.

Factor Structure of Health Enhancing Behavior Index

The Kaiser-Meyer-Olkin measure of sampling adequacy of the subsclaes in the *health enhancing behavior Index (HEBI)*, at 0.86. At the same time the Bartlett test of sphericity was also acceptable (*p*<.001), indicating that items in the HEBI were interdependent (x^2=14089, df=465, p<.001). These two measures of psychometric adequacy suggested that the subsclaes in the HEBI correlation matrix was suitable for factor analysis.

The examination of the factor structure of the subscales in the HEBI was started with exploratory factor analysis by using principal component analysis with oblique rotation. Because, subscales were related empirically (Costa, Jessor, & Turbin 2007). The analysis produced a four-factor model (eigenvalues > 1.0 as a criterion), which accounted for 72.8.% of the total variance. All of the items loaded mainly on their own factors. The factor loadings for each subscales in the HEBI are presented in Table 5. The first factor was labelled Risky Driving and item loadings ranged from .82 to .95. The second factor was labelled Attention to healthy diet and item loadings ranged from .45 to .71. The third factor was labelled Physical Activity and item loadings ranged from .62 to .72. The fourth factor was labelled seat belt use and item loadings ranged from .60 to .61. Exploratory factor analysis revealed that subscales in the Turkish version of HEBI is same factor structure as the original form.

Table 8
Factor Structure of Health Enhancing Behavior Index

Items	Factor Loadings			
	1	2	3	4
175	.95			
178	.94			
176	.93			
173	.92			
177	.89			
174	.82			
256		.71		
252		.70		
253		.64		
254		.63		
255		.61		
257		.45		
50			.72	
51			.68	
52			.62	
179				.61
180				.60
% of variance	30.69	16.51	14.65	10.93
Total of variance= 72.80%				

Note: 1= Risky Driving, 2=Attention to Healthy Diet, 3= Physical Activity, 4= Seat Belt Use

Factors provided by the principal component analysis were evaluated using a confirmatory factor analysis (CFA). For the HEBI, CFA indicated that the thirteen-factor model fit the data acceptable: X^2=169.10, df=53, p<.001; X^2/df=3.19; GFI=.92; AGFI; .90; SRMR=0.06.

Reliability Analyses

Reliability refers to the consistency of a measurement, and is usually determined by the extent to which a score can be replicated in identical or equivalent testing situations (Naughton et al., 1996).

Internal consistency

Cronbach's coefficient alpha is the basic formulas for determining the reliability of instruments based on internal consistency (Naughton et al., 1996; Fayers & Machin, 2000). Coefficient alpha will be higher the more items that are included in the measure of a particular concept or domain, and the higher the average correlation between responses to all possible combination of items in the domain. Coefficient alpha can be calculated on all component domains of the instrument. The higher the coefficient, the better the internal consistency of the measure.

Table 9

Means and Standard Deviations and Internal Consistency of Reliability of the SPSD

	Subscales	No. Of items	Min. score	Max. score	Mean (SD)	Cronbach's alpha (n=340)	Corrected item total correlation
Personality System	Value on Academic Achievement	4	4	16	9.77 (2.49)	.84	.67-.72
	Value on Health	5	5	20	15.81 (3.15)	.77	.47-.69
	Expectation for Academic Achievement	4	4	16	5.06 (1.99)	.71	.47-.60
	Attitude toward School	3	3	12	7.28 (1.99)	.75	.54-.61
	Perceived Life Chances	7	7	35	22.53 (4.85)	.88	.65-.74
	Religiosity	4	4	16	12.65 (3.38)	.86	.65-.76
	Self-esteem	5	5	20	14.77 (2.29)	.76	.30-.59
	Depression	4	4	16	10.20 (3.309	.82	.52 -.75
	Stress	4	4	16	10.72 (2.79)	.63	.35-56
	Attitudinal Intolerance of Deviance	7	7	28	19.00 (1.85)	.69	.29-.63
	Impulsivity	5	0	5	1.31 (1.28)	.69	.32-.61
Perceived Environment System	Friends controls against problem behavior	3	3	12	9.44 (1.83)	.48	.23-.41
	Friends disapproval of problem behavior	2	2	8	4.82 (1.24)	.60	.31-.57
	Friends model for problem behavior	4	4	16	5.71 (1.91)	.44	.11-.50
	Friends model for conventional behavior	4	4	16	8.78 (1.95)	.60	.32-.43
	Friends model for health behavior	3	3	12	6.13 (1.53)	.57	.32-.42
	Parent/friends compatibility	3	3	12	7.31 (2.22)	.71	.49-.61
	Parent models for health behavior	6	6	18	13.41 (3.50)	.81	.48-.65
	Parent support	3	3	12	6.15 (2.52)	.84	.64-.81
	Family closeness	3	3	12	9.57 (2.43)	.84	.68-.73
	Student disapproval of risk behavior	6	6	24	21.01 (4.64)	.83	.55-.69
	Student approval of conventional behaviors	4	4	20	8.63 (3.21)	.75	.24-.39
	Student models for risk behavior	2	2	8	5.45 (1.29)	.68	.39-.61

| Teacher support | 2 | 2 | 8 | 4.68 (1.65) | .80 | .66 |

Table 9 Continued

Behavior System

Subscales	No. Of items	Min. score	Max. score	Mean (SD)	Cronbach's alpha (n=340)	Corrected item total correlation
Multiple Problem Behavior	30	7	87	15.91 (10.02)	.91	.32-.78
Index	6	0	12	5.38 (6.31)	.95	.71-.93
Smoking dependence	8	0	40	6.32 (5.38)	.96	.76-.93
Alcohol Use	7	7	28	8.25 (3.26)	.85	.21-.87
Deliquent behaviors	9	0	7	.34 (1.18)	.88	.42-.89
Illcit drug use						
Health-enhancing Behaviour	17	17	72	26.52 (7.04)	.74	.22-.47
Index	3	3	12	6.10 (3.06)	.88	.72-.81
Physical Activity	6	6	24	12.19 (3.66)	.96	.79-.94
Risky Driving	2	2	8	6.98 (2.88)	.77	.63
Seat belt Use	6	6	24	12.14 (2.74)	.68	.20-.63
Attention to Healthy Diet						

Table 9 presents the internal consistency of the SPSD domains. Cronbach's alpha values of the subscales in personality system had ranged from .63 in the Stress subscale to .88 in the Perceived Life Chances subscale. Cronbach's alpha values of the subscales in Perceived Environment System had ranged from 0.44 in the Friends Model for Problem Behavior subscale to 0.84 in the Parent Support and Family Closeness subscales. Cronbach's alpha values of the subscales in MBPI had ranged from 0.85 in the Delinquent Behavior subscale to 0.96 in the Problem Drinking subscale. And Cronbach's alpha values of the subscales in HEBI had ranged from 0.68 in the Attention to Healthy Diet subscale to 0.96 in the Risky Driving subscale. These indicate a moderate to strong internal reliability across all subscales and reporters.

Discussion

This study established validity and reliabilty information about the Turkish version of the SPSD, which is essential to guiding users in tool's usefulness for assessment and planning purposes with young adolescent's problem behaviors and risk and protective factors. Specifically, the applicability of th SPSD to Turkish young adulthoods was examined by its construct validity, internal consistency, item-total correlations.

As stated earlier study, SPSD composed of three diffrent systems; Personality System, Perceived Behavior System, and Behavior System. So factor structure of these systems were analysed separately. The results, consistent with the original factor structure for Personality system yielded thirteen-factor solution (Jessor et al., 1991). And two indexes (MPBI and HEBI) were included in Behavior System and factor structure of these indexes were analysed separetely. And this results show that consistent with the original factor structure for the MPBI and HEBI. On the other hand factor structure for the Perceived Environment System did not same the

factor structure of the orijinal SPSD. Two subscales (Peer pressure to drink and Parent disapproval of problem behaviors) were eliminated the Perceived Environment System. Except for two subscales the current results support the hypothesis that the SPSD scale assesses risk and protective factors of problem behaviors that align fairly well with Jessors' (1987) theoretical model.

Results showed that, the subscales of the SPSD provied to be internally consistent and reliable with this population. The coefficient alphas were from .63 to .88 for the Personality System subscales and from .44 to .84 for the Perceived Environment System subscales and from .74 to .96 for the Behavior System subscales. A coefficient alpha of. 70 is required for research purposes (Nunnally, 1978). In this study three subscales cronbach alpha is lower than .70. But this result may explain the small number of items that compose the subscales in SPSD reduces the likelihood obtaining high alpha coefficents. As a result estimated alpha coefficients surpassed levels of adeqaucy and were highly comparable to those reported by Jessor et al. (2003).

Although encouraging, our results with the Turkish version of this measure should be carefully interpreted considering its limitations. Given the limited targeted population (students from Education Faculty, only one university in Turkey), it is not known how our findings will generalize to other groups (e.g. noneducated young adults, different faculty students). Therefore, future studies should aim to replicate these findings with larger, more representative samples including different faculties (i.e., medicine, science) and countries in Turkey.

Our findings suggest that the Turkish version of the SPSD is a culturally appropriate, valid and reliable instrument to assess problem behaviors in young adults. This study makes an important contribution to the field by documenting the psychometric properties of a recognized measure of problem behaviors in the assessment of Turkish young adults.

In conclusion, our results provide substantial evidence that supports the potential utility of this scale in early identification of risk and protectective factors that may related the problem behaviors of Turkish young adults. Our findings have important implications for the design and evaluation of intervention programs to promote the health related and prosocial behaviors and to prevention of difficulties such as delinquent behaviors, and illicit drug use.

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