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Adaptation of the Trust in the Coach Scale into Turkish: Validity and Reliability Study

Zafer Dođru*

Department of Physical Education and Sports, Faculty of Sports Sciences, Hitit University, Corum, Turkey

Study Area: Corum, Turkey

Coordinates: 40°33'00"N 34°57'14"E

Key words: Integrity, Benevolence, Competence, Cooperation, Scale Adaptation

Permission was obtained from the authors of the original scale via e-mail for the adaptation study into Turkish. In addition, ethics committee approval (2019-112) was obtained from the Hitit University Non-Interventional Researches Ethics Committee and the institutional permission was granted by the HUFSS.

Introduction:

Sports and athletes are generally at the center of attention in the society. Especially in popular sports, this interest is experienced more intensely. The actors of this interest are athletes, coaches, club managers and spectators, in addition to these, the other factors are press and TV. The performance that the athletes perform or will perform is a social phenomenon followed by other interested parties (fans, press, food and beverage vendors, advertisers, etc.). The intense interest and expectation have led to the investigation of the relationships of the athletes with their coaches and to work on this subject. Recent studies have focused on the leadership characteristics of the coaches (Filiz & Demirhan, 2017; Altıntaş *et al.*, 2012), factors that affect the behavior of the coaches, situational and demographic characteristics, consequences of the leaders' actions, how the leaders' behavior affects the performance of their athletes and satisfaction of athletes (Filiz & Demirhan, 2017).

As per Vieira & Palmer (2012), Gyllensten & Palmer (2007), and O'Broin & Palmer (2010), demonstrated in their studies that 'trust' in the coach-athlete relationship is an important dimension in the coaching process. They developed the Coaching Skills Self-Efficacy Scale (CSSES) scale to measure this. They carried out important studies on the leadership characteristics of the coaches with their work titled "Preferred leadership in sports" (Chelladurai & Saleh, 1978) and "Dimensions of leader behavior in sports:

Abstract

In this study, the trust in the coach scale has been translated and adapted into Turkish and determined the validity and reliability of the scale. The study group consisted of 340 (232 males and 108 females) competitive sport clubs athlete attended. Cronbach Alpha value of the adapted scale was found to be 0.97. The internal consistency coefficients of the sub dimensions ranged between 0.84-0.95, respectively. Confirmatory factor analysis was performed to test the factor structure obtained after exploratory factor analysis in order to reveal the factor structure of trust in the coach. As a result of confirmatory factor analysis, it was found that the scale has eight-dimensional structure in its adapted form as it is in its original form. As a result, it can be told that the scale adapted into Turkish found to be valid and reliable to measure the attitudes of Turkish Athletes.

development of a leadership scale" (Chelladurai & Saleh, 1980). Zhang & Chelladurai (2013) formed the theoretical infrastructure and model of the "trust in the coaches scale" in their extensive study. It is aimed to adapt the 8-dimensional "Trust in the Coach Scale" created as a result of the study to the Turkish language. As stated by Zhang & Chelladurai (2013), statistical evidences did not support the 6th and 8th hypotheses but confirmed the other hypotheses. However, it was thought that this model and scale would be a new and important scale in explaining and discussing the relations of Turkish athletes with their trainers.

Their model (Fig.-1) includes coach characteristics of justice, benevolence, integrity, and competence which are said to contribute to trust in the coach. Trust in the coach, in turn, fosters commitment to leader and willingness to cooperate both of which influence perceived performance. Finally, "trust in the coach" have a direct effect also on perceived performance.

Figure-1: Theoretical model of antecedents and consequences of trust in the coach. H=hypothesis.

*Author: zaferdogru@gmail.com

Figure-2: Coefficients for the direct effects model.

The structural model related to the scale revealed at the end of the study is in Fig.-2 (Zhang & Chelladurai, 2013).

Methodology:

This paper is a scale adaptation study.

The athletes who were studying at the Hitit University Faculty of Sports Sciences (HUFSS) were the subjects during the study period and they had already worked one year or more with their coaches. The sample of the study consisted of 340 athletes, the average age was 21.24 ± 2.150 , $n=108$, 31.8% female and $n=232$, 68.2% male athletes.

It was previously recommended that 5 to 10 observations per item would be enough for the exploratory factor analysis in the scale studies (Büyükoztürk, 2002; Doğan & Başoğlu, 2010; Yaşlıoğlu, 2017). It was also stated that as the sample size increased, sensitivity increased in determining the difference between the obtained data (Hair *et al.*, 1998). There were approximately 14 observations per item for this study.

Athletes studying at the Faculty of Sport Sciences of Hitit University, who were willing to participate in the study and accepted to sign the consent form, were included in the study. The original scale was translated into Turkish and used as a data collection tool. 400 data forms were checked, and 35 missing forms and 25 outliers were excluded.

In order to adapt the scale, which was published in English, it was translated independently by three expert lecturers in Turkish and English and three English teachers. These translations were brought together by the researcher, experts were asked for their opinions again to decide on the most appropriate meaning, and a single Turkish form was created with the most understandable items that were agreed upon in line with the opinions. Afterwards, the measurement tool was translated back into English by a faculty member who was proficient in English. The conformity of the meanings between the English translation of the scale and its Turkish translation was tried to be accomplished. Validity and reliability studies of the Turkish form were also conducted. Content validity was carried out with three academicians who were experts in the field of coaching education.

Reliability analysis, exploratory and confirmatory factor analyzes were performed. Corrected total item correlations were calculated for items suitability. The factor structure that emerged in the original scale was tested first by exploratory factor analysis (EFA) and then by confirmatory factor analysis (CFA).

A scale can be directly started with confirmatory factor analysis (CFA) for the factor pattern in the culture to be adapted in scale adaptation. Because the factor pattern of the measuring tool in the original culture has been revealed by qualitative and quantitative studies, there are experimental evidences regarding the construct validity of the measuring tool. There are different approaches about how EFA and CFA should be used in scale

development and adaptation studies.

While Jöreskog & Sörbom (1993) recommended doing EFA first, then CFA, Gorsuch stated that CFA was a very powerful test that allowed the assumptions to be tested, and Gerbing & Hamilton stated that CFA could contribute to EFA by doing it first (cited in Çokluk *et al.*, 2018: 283).

Whether the factor design of the measurement tool is preserved in the target culture can be questioned by testing with confirmatory factor analysis (Çokluk *et al.*, 2018: 283). For this reason, exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were performed to test the 8-factor structure of the scale. Reliability analysis and exploratory factor analysis of the scale were performed by using SPSS 22.0 and confirmatory factor analysis by using LISREL 8.71. Shapiro-Wilk test was used to test the normal distribution, Mann-Whitney U was used to test the difference between the upper and lower 27% groups.

Results:

Results of the study were given in this section for the study group; descriptive statistics, reliability analysis, exploratory factor analysis and confirmatory factor analysis. The study group consisted of total 340 athletes, $n=108$ 31.8% female and $n=232$ 68.2% male. It was tested whether the data were suitable for normal distribution. It was seen that the data do not show a normal distribution (Common $df=340$ and $p<0.001$; Table-1).

Table-1: Tests of Normality (Common $df=340$ and $p<0.001$)

Items	S-Wilk	Items	S-Wilk	Items	S-Wilk	Items	S-Wilk
01	.783	02	.791	03	.763	04	.751
05	.782	06	.788	07	.855	08	.775
09	.761	10	.822	11	.781	12	.816
13	.820	14	.791	15	.770	16	.796
17	.818	18	.840	19	.858	20	.762
21	.685	22	.800	23	.838	24	.782

After the validity studies, reliability analysis, exploratory and confirmatory factor analyzes were performed and the suitability of the scale for Turkish culture was discussed in this section. For this purpose, reliability analysis was conducted first. The results were presented in Table 3.

The total Cronbach Alpha value of the 24 items was $\alpha=.97$. This value showed that the items of the scale were highly reliable.

Tablo-2: Reliability Statistics

Item	Original Scale α	Adapted Scale Test α
Trust	.74	.84
Justice	.90	.89
Benevolence	.86	.91
Integrity	.91	.93
Competence	.93	.95
Commitment	.76	.88
Cooperate	.77	.89
Performance	.86	.89
Total	.97	.97

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Exploratory Factor Analysis was applied to know whether the items were suitable for factor analysis. Using Bartlett's test of sphericity, the similarity of the correlation matrix was tested. As a result of the test performed in the data group, this hypothesis of similarity was rejected at the level of $p < .001$. This result showed the suitability of the data for factor analysis by revealing the existence of a relationship between the items (Table-4).

Table-3: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.967
Bartlett's Test of Sphericity Approx. Chi-Square	8453.235
df	276
Sig.	.000*

Table-3: showed the suitability of the data for factor analysis.

Table-4: Total variance explained

Component	Total	% of Variance	Cumulative %
1	15.229	63.452	63.452
2	1.430	5.958	69.410
3	1.211	5.046	74.456
4	.730	3.042	77.498
5	.627	2.611	80.109
6	.480	2.002	82.111
7	.459	1.911	84.022
8	.397	1.654	85.677

As a result of the factor analysis, an 8-dimensional structure emerged in accordance with the original scale. Item extraction was not done. The explained total variance was presented in Table 5. It the resulting eight factors explained 85.677% of the total variance. The internal consistency coefficients of the sub-dimensions vary between .84 and .95. After the exploratory factor analysis, confirmatory factor analysis was performed to test the structural compatibility of the items in the scale.

Table-5: Identification of the sub-dimensions of the scale and reliability coefficients

RCM* Factor loading	Factor	α	RCM* Factor loading	Factor	α
Competence	.95		Justice	.89	
15	.77		04	.72	
17	.75		05	.63	
13	.75		03	.45	
14	.72		Commitment	.88	
16	.69		19	.76	
Performance	.89		18	.70	
22	.87		Integrity	.93	
23	.85		11	.57	
24	.75		12	.45	
Trust	.84		09	.44	
02	.86		10	.41	
01	.81		Cooperate	.89	
Benevolence	.91		21	.66	
07	.70		20	.57	
06	.58				
08	.52				

RCM*-Rotated Component Matrix

Extraction Method: Principal Component Analysis. Rotation Method: Varimax with Kaiser Normalization.

α . Rotation converged in 7 iterations.

The values obtained as a result of the Confirmatory Factor Analysis (CFA) were compared with the values in the literature and were presented in Table-6 (Schermerle-Engel, Moosbrugger, & Müller, 2003). The values obtained as a result of the confirmatory factor analysis showed that the model created had an acceptable fit. These values and indicators showed that the scale could be used with 24 items and eight dimensions (Table-6).

Table-6: Goodness of fit Indices Achieved in the CFA

Fit Measures	Perfect Fit	Acceptable Fit	Achieved Fit
χ^2/df	$0 \leq \chi^2/df < 2$	$2 < \chi^2/df < 3$	2.39
RMSEA	$0 < RMSEA < .05$	$.05 < RMSEA \leq .08$	.064
NFI	$.95 \leq NFI \leq 1$	$.90 \leq NFI < .95$	.98
NNFI	$.97 \leq NNFI \leq 1$	$.95 \leq NNFI < .97$	.99
CFI	$.97 \leq CFI \leq 1$	$.95 \leq CFI < .97$	.99
S-RMR	$0 \leq S-RMR \leq .05$	$.05 < S-RMR \leq .10$	.036
GFI	$.95 \leq GFI \leq 1$	$.90 \leq GFI < .95$	.88
AGFI	$.90 \leq AGFI \leq 1$	$.85 \leq AGFI < .90$	.84

There are different goodness of fit indices used in the assessment of model fit and there are statistical functions that these indexes have. Among the recommended indexes, the most used ones are; the similarity ratio, the chi-square statistic (χ^2), RMSEA (Root-mean-square error approximation), GFI (Goodness-of-fit index) and AGFI (Adjusted Goodness-of-fit index) (Joreskog & Sörbom, 2001).

The χ^2 value is related to the difference between the observed and expected values in covariance matrices. When the sample size of the model fit increases (usually over 200) or the sample size decreases (generally below 100), the value of the χ^2 statistic tends to go beyond the fit limits. Therefore, the χ^2 statistic is affected by the sample size. The χ^2 statistic is also affected by the multivariate normality assumption (Schumacher & Lomax, 2004).

RMSEA value equal to or less than .05 is a good fit, between .05 and .08 is sufficient fit, if it is between .08 and 1 is an acceptable fit, if it is greater than 1 is an unacceptable fit (Kaplan, 2000; Schermelleh-Engel, 2003). In another study,

it was stated that RMSEA value equal or less than .05 corresponds to a perfect fit, values between .08 and .10 correspond to an acceptable fit, and a value greater than .10 to bad fit (Hayduk, 1987).

GFI, which is an indicator of the relative variance and covariance amount, takes a value between "0" and "1" and the proximity of this value to 1 indicates that the fit of the model is better (Hair *et al.*, 1998). The road diagram obtained as a result of the confirmatory factor analysis made to be evaluated within the scope of the literature information is presented in Fig.-3.

Table-7: Correlations

Spearman's rho								
	a	b	c	d	e	f	g	h
a	1.000							
b	.584**	1.000						
c	.525**	.749**	1.000					
d	.542**	.757**	.792**	1.000				
e	.473**	.707**	.707**	.805**	1.000			
f	.460**	.603**	.628**	.711**	.710**	1.000		
g	.560**	.709**	.658**	.716**	.700**	.663**	1.000	
h	.422**	.541**	.486**	.522**	.568**	.559**	.557**	1.000
Mean	5.89	5.97	5.82	5.86	5.83	5.38	5.98	5.49
SD	1.247	1.208	1.235	1.226	1.261	1.496	1.341	1.569

a-Trust; b-Justice; c-Benevolence; d-Integrity; e-Competence;
f-Commitment; g-Cooperate; h-Performance
n=340. **Correlation is significant at the .01 level (2-tailed).

In the correlation coefficient values of the sub-dimensions, positive and statistically significant relationships between .422 & .805 were obtained (Table-8).

According to the Lower-Upper group method, item difficulty and item discrimination power values were calculated (Brennan, 1972). Finally, 27% of the upper group and 27% of the subgroup were compared for each item to test the discriminative power of the items (Table-8).

Table-8 revealed that each item had a discriminative power between the athletes in the 27% upper group and 27% lower group. There were statistically significant differences between the scores of the athletes in the lower and upper groups of 27% in all 24 expressions, and the scores of the upper group were found to be higher.

The scale is 7-point Likert type and consists of eight sub-dimensions, there is no negative expression in the scale. The sub-dimensions of the scale are;

Trust; 1, 2	Justice; 3, 4, 5
Benevolence; 6, 7, 8	Integrity; 9, 10, 11, 12
Competence; 13, 14, 15, 16, 17	Commitment; 18, 19
Cooperate; 20, 21	Performance; 22, 23, 24.

The original version of the 24-item scale adapted to the Turkish language and culture is presented in Table 10. The Turkish form is included in the appendices. It is seen that the Turkish form also preserves the stable structure in the original scale.

Table-8: Comparison of 27% lower-upper groups with Mann-Whitney U

#	Groups of 27%	Mean Rank	Sum of Rank	U	Z	p
01	Upper	126.587	11646	1096	-9.28631	.000*
	Lower	58.41304	5374			
02	Upper	123.5598	11367.5	1374.5	-8.40241	.000
	Lower	61.44022	5652.5			
03	Upper	133.4076	12273.5	468.5	-11.1776	.000
	Lower	51.59239	4746.5			
04	Upper	133.4293	12275.5	466.5	-11.3099	.000
	Lower	51.57065	4744.5			
05	Upper	134.1522	12342	400	-11.3724	.000
	Lower	50.84783	4678			
06	Upper	132.75	12213	529	-10.7639	.000
	Lower	52.25	4807			
07	Upper	133.2283	12257	485	-10.7269	.000
	Lower	51.77174	4763			
08	Upper	135.3913	12456	286	-11.5445	.000
	Lower	49.6087	4564			
09	Upper	135.5652	12472	270	-11.5984	.000
	Lower	49.43478	4548			
10	Upper	137.212	12623.5	118.5	-11.936	.000
	Lower	47.78804	4396.5			
11	Upper	132.2935	12171	571	-10.7969	.000
	Lower	52.70652	4849			
12	Upper	135.5978	12475	267	-11.5763	.000
	Lower	49.40217	4545			
13	Upper	135.087	12428	314	-11.3778	.000
	Lower	49.91304	4592			
14	Upper	135.1196	12431	311	-11.438	.000
	Lower	49.88043	4589			
15	Upper	134.9674	12417	325	-11.4277	.000
	Lower	50.03261	4603			
16	Upper	133.4891	12281	461	-11.0914	.000
	Lower	51.51087	4739			
17	Upper	136.9348	12598	144	-11.8643	.000
	Lower	48.06522	4422			
18	Upper	133.8043	12310	432	-10.8602	.000
	Lower	51.19565	4710			
19	Upper	133	12236	506	-10.6404	.000
	Lower	52	4784			
20	Upper	132.9674	12233	509	-10.9868	.000
	Lower	52.03261	4787			
21	Upper	131.3043	12080	662	-10.8614	.000
	Lower	53.69565	4940			
22	Upper	131.2772	12077.5	664.5	-10.3889	.000
	Lower	53.72283	4942.5			
23	Upper	132.3315	12174.5	567.5	-10.4907	.000
	Lower	52.66848	4845.5			
24	Upper	130.8696	12040	702	-10.3135	.000
	Lower	54.13043	4980			*p<.001

Discussion:

So far, many studies have generally tried to measure and evaluate the relationships between coaches and athletes by using developed and/or adapted scales. During the period of the current study, no scale with a structural model was found in the available resources. It was thought that this

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adapted scale (field-specific measurement tool) would contribute to the literature. In general, there are constant changes in the training conditions of athletes, many experimental studies are carried out for performance; such as duration, load, intensity, diet, ergogenic aids.

Table-9: Final version of "Trust in the Coach" Scale (TCS)

Items	Strongly disagree					Strongly agree	
	1	2	3	4	5	6	7
01- I can freely share my ideas, feelings, and hopes with my coach.							
02- I would be comfortable giving coach a task or problem that was critical to me.							
03- My coach appreciates the work done by every athlete.							
04- My coach tries to be fair in dealings with athletes.							
05- My coach has a strong sense of justice.							
06- My coach really looks out for what is important to me.							
07- My needs and desires are very important to my coach.							
08- My coach is willing to go out of the way to help me.							
09- My coach deals honestly with me.							
10- My coach always tells me the truth.							
11- Sound principles seem to guide my coach's behavior.							
12- I like my coach's values.							
13- My coach has special abilities that can increase our performance.							
14- My coach is very capable of performing the coaching job.							
15- My coach is known to be successful at the things he/she tries to do.							
16- I feel very confident about my coach's skills.							
17- My coach has much knowledge about the work that needs done.							
18- Since joining this team, my personal values and those of my coach have become more similar.							
19- I feel a sense of belonging with my coach.							
20- I am willing to cooperate with my coach to get the work done.							
21- I am willing to communicate with my coach.							
22- My team's victories this season.							
23- The extent to which the team has met its goals for the season thus far.							
24- The improvement in my performance over the previous season							

One of the important keys in sportive performance is a coach-athlete relationship and it is known that the quality of this relationship affects the performance of the athletes (Filiz & Demirhan, 2017; Zhang & Chelladurai, 2013; Altıntaş et al., 2012; Jowett, 2003; Dirks, 2000; Mayer, Davis & Schoolman, 1995; Chelladurai & Saleh, 1980; Chelladurai & Saleh, 1978).

The study was thought to be valuable as the relationship between the coach and athlete, based on the literature review mentioned above. This scale, which deals with the relationships between athletes and coaches on the basis of trust, has been adapted to Turkish culture and language. The results of both EFA and CFA showed that the adapted scale was a valid and reliable scale. A Turkish form was created as Antrenöre Güven Ölçeği (AGÖ). This scale is thought to be very important and useful in terms of measuring the confidence levels of athletes in their coaches. This scale adaptation study was carried out by occupying athletes from team sports studying at Hitit University Faculty of Sport Sciences, and it is recommended to redo the same study by expanding the sample size by recruiting athletes from individual sports. It was considered that amateur and professional athletes could be used in studies to be conducted within the framework of different variables such as different sports branches, age, gender, sports age and

duration of working with the coach.

It was also thought that the scale could be a pioneer in evaluating the coach-athlete relationships by using it as a measurement tool in the research subjects.

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