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I'INVANTAIRE DES STRATEGIES DE COPING EN COMPETITION SPORTIVE (ISCCS): EVALUATING THE TURKISH VERSION BY CONFIRMATORY FACTOR ANALYSES

ABSTRACT

In the present study, the aim was to evaluate the psychometric properties of the Turkish version of the I'Invantaire des Stratégies de Coping en Compétition Sportive (ISCCS) by using confirmatory factor analyses. A total of 647 athletes (381 men and 276 women) competing in different sports completed the Turkish version of the ISCCS. Five different factor structures were evaluated: the six-factor model (Task oriented coping), a four-factor model (emotion-oriented), ten factor model and alternate two and three-factor model. The results revealed that only the 10- factor model displayed an acceptable fit to the data.

Keywords: ISCCS, Confirmatory Factor Analysis, Turkish Version, Coping With Stress, Sport

SPORDA STRESLE BAŞA ÇIKMA STRATEJİLERİ ENVANTERİNİN (SSBÇSE) TÜRKÇE FORMUNUN DOĞRULAYICI FAKTÖR ANALİZİ İLE DEĞERLENDİRİLMESİ

ÖZET

Bu çalışmanın amacı, Sporda Stresle Başa Çıkma Stratejileri Envanteri (SSBÇSE)'nin Türkçe formunun psikometrik özelliklerinin doğrulayıcı faktör analizi değerlendirilmesidir.Çalışmaya 647 (381 erkek ve 276 kadın) sporcu katılmıştır. Beş farklı factor yapısı değerlenirilmiştir: altı-faktörlü model (görev yönelimli başa çıkma), dört faktörlü model (duygu yönelimli başa çıkma), on-faktörlü mode ile iki ve üç-faktörlü modeller. Sonuçlar 10 faktörlü modelin kabul edilebilir düzeyde uyum gösterdiğini ortaya koymaktadır.

Anahtar Kelimler: SSBÇSE, Doğrulayıcı Factor Analizi, Türkçe Versiyonu, Stres ile Başa Çıkma, Spor

1. INTRODUCTION (GİRİŞ)

In recent years, sport psychology researchers have to be interested in coping strategies used by athletes in the competitive settings. Stress is common in sports. When athletes compete in sport they may appraise an array of potential stressors, including violence, injury, burn out, bad decision from referee, pain, fear, and lack of confidence, psychological demands, coach stress, and the demands of playing sport (Anshel, 2001; Dale, 2000; Gould, Eklund, & Jackson, 1993; Junge, 2000; Holt & Hogg, 2002; Nicholls, Holt, & Polman, 2005). The ability to cope with stressful events effectively is imperative for successful sport performance. The failure to cope with stressors can have a detrimental effect on various psychological processes (Anshel, 1990; Anshel & Wells, 2000).

Coping was defined by Lazarus and Folkman (1984) as "constantly changing cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p.41). Lazarus and Folkman (1984) described two main categories of coping: problem- focused strategies and emotion- focused strategies. Problem focused strategies refer to cognitive and behavioral efforts to try to cope with stress which include solving the problem, obtaining information, planning, learning new skills and increased effort. Emotion- focused coping strategies aim at reducing unwanted physical and emotional arousal and includes humor, venting of emotion, and acceptance. The avoidance-oriented coping, represents the actions that are employed in order to disengage oneself from the task and to redirect one's attention on task-irrelevant cues. This dimension includes specific strategies such as behavioral disengagement, denial, and use of alcohol/drug (Gaudreau & Blondin, 2002).

A theoretical view for examining coping strategies has been approach and avoidance coping (Anshel, 1996; Anshel, Williams & Hodge, 1997; Krohne, 1993; Roth & Cohen, 1986). Generally, approach coping style refers to behavioral, cognitive and emotional activity directed toward the actual threat or its cognitive and emotional inner interpretations. Avoidance coping style refers to activity directed away from the threat (Anshel & Wells, 2000). Folkman and Lazarus (1984) found that, individuals used approach coping strategies such as confrontation, problem solving, positive reappraisal, accepting responsibility in controllable situations. When the situation is not uncontrollable, more distancing and escape avoidance patterns were applied.

Research related with coping in the sport domain is restricted because of measurement problem. In recent years, sport-specific measurement tools have been developing. Most of the scales are revised versions of non- specific sport scales. Ways of Coping Checklist (WCC) was developed by Folkman and Lazarus (1984) to study coping. It contains 66 items for measuring coping styles of non- sport population. This scale has eight subscales and it includes items which are related with cognitive and behavioral strategies in order to manage stressful conditions.

Madden, Kirkby and McDonald (1989) utilized the Ways of Coping with Sport Checklist (WOCS) their revision of the WCC was comprised of eight scales. Although the primary focus of their study was to investigate how to cope with stressful athletic events. Crocker (1992) also sought to develop a sport- related coping measurement instrument (Ways of Coping Questionnaire-WOCQ). Crocker independently modified

the WCC for competitive sport by asking competitive athletes to write out strategies used to manage competitive stress. Based on the responses of the athletes, Crocker added six new ratings. In addition, four items were deleted. Crocker reported that strategies could be organized in eight dimensions: active, problem- focused, social support, reappraisal, wishful thinking, self-control, detachment and self-blame.

Reacting to the deficiencies in WOCQ, Carver, Scheier, and Weintraub (1989) developed COPE Inventory. It measures 13 coping strategies that are applicable into numerous stressful setting. It measures problem- oriented, emotion- oriented, avoidance based and withdraw based strategies. Crocker and Graham (1995) developed the sport version of the COPE. The Modified COPE (MCOPE) is contained nine scales from the original COPE and three scales from the sport version of WOCQ.

Athletic Coping Skills Inventory – 28 (ACSI-28) was developed by Smith, Schutz, Smoll, Ptacek, (1995) for using sport related researches and measuring psychological skills in sport domain. It consists of seven sport specific sub-dimensions: Coping with Adversity, Peaking under Pressure, Goal Setting/Mental Preparation, Concentration, Freedom from Worry, Confidence and Achievement Motivation, and Coachability

Other sport specific measures have been developed by Anshel and Kaissidis (1997). Anshel and Kaissidis developed the Coping Style Inventory for Athletes (CSIA) to examine coping strategies utilized among competitive athletes in response to specific stressors. The CSIA was developed to simultaneously assess an individual's situational appraisals and his or her coping responses to selected stressful situations that related with game. CSIA was developed to be used in a particular study with basketball players.

Coping Style Scale for Sport (CSSS) was created by Anshel, Williams and Williams (2000) for determining the how athletes cope with acute stress during competition. Coping Function Questionnaire for Adolescent and Sport was developed by Kowalski and Crocker (2001). It's made up of 18- items and it evaluates the three functional dimensions (problem- focused strategies, emotion- focused strategies and avoidance) of coping with stress.

I'Invantaire des Stratégies de Coping en Compétition Sportive (ISCCS) was created to measure coping actions used by athletes in sport competition. Specifically, it enables the assessment of actions that are used by athletes to prepare for a competition (pre-competition) as well as those that are used during sport competition (in-competition) (Gaudreau & Blondin,2002). The conceptual model of the ISCCS is based on a hierarchical organization of the coping construct. The ISCCS measures 10 coping strategies frequently used by athletes in competitive sport settings. The 10 coping strategies of the ISCCS can be organized in three dimensions representing task-oriented coping (mental imagery, effort expenditure, thought control, seeking support, relaxation, logical analysis), distraction-oriented coping (distancing, mental distraction), and disengagement-oriented coping (venting of unpleasant emotion and disengagement). These coping strategies were represented two functional higher-order dimensions: Task oriented coping (TOC) and Emotion oriented coping (EOC) (Gaudreau & Blondin, 2002).

The purpose of the present study was to examine the psychometric properties of the Turkish version of the ISCCS by using confirmatory factor analysis.

2. RESEARCH SIGNIFICANCE (ÇALIŞMANIN ÖNEMİ)

ISCCS is the newest and the most applicable scale to the sport domain in the sport psychology literature. When we consider the deficiencies in the sport psychology research related to coping with competitive stress in Turkey, the purpose of the present study was to examine the psychometric properties, based on measurement models previously proposed in the literature, of the Turkish version of the ISCCS by using confirmatory factor analysis. Adapting ISCCS for Turkish athletes will eliminate the measurement deficiencies of coping with competitive stress.

3. METHOD (YÖNTEM)

3.1. Participants (Araştırma Grubu)

A total of 647 athletes (381 men and 276 women) aged 20.96 ± 5.35 years (mean+s) and sport age 9.1±4.4 (mean+s) at competitive team (basketball, volleyball, handball, football) and individual sports (tennis, swimming, athletics, fencing) in Turkey volunteered to complete the Turkish version of the ISCCS and they competed in a variety of sports. Purposive sampling procedure was used. Of the returned inventories, 30 were (12 men and 18 women) only partially completed and were consequently excluded from further analysis, so the number of usable inventories was 617.

3.2. Instrument (Veri Toplama Aracı)

ISCCS was developed by Gaudreau and Blondin (2002) in Canada for evaluating the athletes coping strategies during the competition. The ISCCS measures 10 coping strategies frequently used by athletes with 39 items, divided into ten subscales. One of the subscales (effort expenditure) consists of 3 items and the other nine subscales (mental imagery, effort expenditure, thought control, seeking support, relaxation, logical analysis, distancing, mental distraction, venting of unpleasant emotion and disengagement) consist of 4 items. Participants respond to a 5- point scale that ranges from 1 (not used at all) to 5 (used very much). Translation of the ISCCS into Turkish was conducted according to a standardized back-translation procedure. The original ISCCS was first translated into Turkish and sent to two bilingual translators (Turkish –French) who then translated it back into French. Subsequently, differences were discussed and solved so that the original meaning of each original (French) item was considered to be present in the final Turkish version (Hambleton, Merenda and Spielberger, 2006).

3.3. Procedures (İşlem Yolu)

Before completing the inventory, the participants were assured of confidentiality and provided with verbal and written instructions that emphasized (a) that there were no right or wrong answers and (b) the importance of responding honestly. The participants were further instructed to recall a competition they had participated in during the previous season, which they judged to be the most important one for them, and to refer to their state of mind immediately before that particular competition when completing the ISCCS. Inventories were applied by researchers.

3.4. Data Analyses (Verilerin Analizi)

Given that the present questionnaire was adapted from the ISCCS, a confirmatory factor analysis (CFA) was conducted in an attempt to validate the questionnaire's factor structure and composition. It was decided to test the tenability of a five different factor structures were presented in the original research (Gaudreau & Blondin, 2002). Thus, in this study five models were evaluated: the original six-factor model (Task oriented coping), a four-factor model (emotion-oriented), ten factor model and alternate two and three-factor model. Cronbach Alpha was used to examine the reliability of the scale.

Twenty-six participants were excluded from further analyses because their questionnaires had been completed improperly. Also, fourteen participants were identified as multivariate outliers and were removed from further analysis (Mahalanobis distance $p<0.001$; see Tabachnick & Fidell, 2007).

Confirmatory factor analysis (CFA) was performed with LISREL 8.7 using maximum likelihood estimation. In confirmatory factor analysis the X^2 statistic, however, has been criticized for being overly sensitive to sample size and being ambiguous in terms of how close the implied and observed covariance matrices must be to indicate that the model fits the data (Brown, 2006). Due to these limitations, the CFI and the Goodness-of-Fit Index (GFI) were employed. Fit indices greater than .90 for CFI and a GFI and less than .10 for RMSEA were considered indicative of acceptable model fit. SRMR expected to be >.10 (Klein, 2005). As with the SRMR, RMSEA values of 0 indicate perfect fit (and values very close to 0 suggest good model fit). Specifically, "close" fit (CFit) is operationalized as RMSEA values less than or equal to .05 (Brown, 2006). Hu and Bentler (1999) suggest the following guidelines. Support for contentions of reasonably good fit between the target model and the observed data is obtained in instances where (1) SRMR values are close to .08 or below; (2) RMSEA values are close to .06 or below; and (3) CFI and NNFI values are close to .95 or greater.

4. FINDINGS AND DISCUSSION (BULGULAR VE TARTIŞMA)

Five measurement models were evaluated in all samples: the original ten-factor model, the two-factor model (Task oriented coping and emotion oriented coping), the three factor model (task oriented coping, distraction oriented and disengagement oriented coping) the four factor model (emotion oriented coping with distancing, mental distraction, venting of unpleasant emotions and disengagement subscales) and the six factor model (task oriented coping with mental imagery, effort expenditure, thought control, seeking support, relaxation, logical analysis) suggested by Gaudreau and Blondin (2002).

Table 1. Confirmatory factor analysis and model modifications of the ISCCS
(Tablo 1. ISCCS'nin doğrulayıcı faktor analizi ve model modifikasyonları)

Model	X^2	df	NNFI	CFI	SRMR	RMSEA	90 % Confidence Interval RMSEA
6 Factor (TOC)	665.42*	215	.94	.95	.056	.058	.053-.063
4 Factor (EOC)	371.88*	98	.90	.92	.058	.067	.060-.075
10 Factor	1671.84*	657	.92	.93	.063	.048	.047-.053
2 Factor	4397.07*	664	.79	.80	.096	.10	.093-.098
3 Factor	4155.72*	699	.81	.82	.096	.090	.087-.092

X^2=Chi-square, d.f=degrees of freedom, NNFI=non-normed fit ndex, CFI=comparative fit index, SRMR=standardized root mean square residual, RMSEA= root mean square error of approximation, 90% CI=%90 confidence interval
*p<.05

As shown in Table I, the chi square statistics in the all models were significant in all samples. The NNFI (range = 0.79 – 0.81) and CFI (range = 0.80 – 0.82) fit indices also indicated an inadequate model fit in two and three-factor model, whereas the RMSEA (= 0.090-.10) and SRMR (= 0.096) were not acceptable. The chi-square statistics were however still significant for four-factor model and the six-factor model taking the NNFI (= 0.90-.094), the CFI (= 0.92-.095) with acceptable SRMR (SRMR<.08) and RMSEA (.058-.067) but these models were not show exact fit (RMSEA<.05, Brown, 2006 or RMSEA<.06, Hu & Bentler, 1999). The confirmatory factor analyses of the 10-factor model revealed an improved model fit in all samples. Although the chi square statistics were significant, the fit indices indicated that the model fit was acceptable (NNFI= 0.92; CFI = 0.93; SRMR = 0.06; RMSEA: 0.048 [90% CI: range = 0.047 – 0.053]). The standardized solution for factor loadings and error variances for the 10-factor model are shown in Table 2.

In their research, results of the study provided reasonable support by showing the good fit of two theoretically derived sub models (the six-factor TOC model and the four-factor EOC model) and the acceptable fit of a 10-factor model. The 10-factor model was compared with alternate two- and three-factor models. As hypothesized, a 10-factor model fitted the data better than both alternate models. Fit indecies of the 10 factor model in original form were X^2= 910.97, df=652, p=.000, CFI=.93, NNFI=.92 and RMSEA=.036 (Gaudreau &Blondin; 2002).

Gaudreau and Blondin provided evidence for the factorial structure of the 10-factor model of the ISCCS (X^2= 1289.52, df=657, p=.000, CFI=.93, NNFI=.91 and RMSEA=.05 in a sample of 450 athletes from various sports (Gaudreau, El Ali & Marivain, 2005). But in their research with marathoners Gaudreau, El Ali & Marivain (2005) failed to support 10 factor model of the ISCCS. In addition, the fit indecies for the Turkish version are very similar. The analyses demonstrated that the hypothesized 10-factor model of the ISCCS made an acceptable to good fit to data in Turkish samples, indicated by the low (<.05 and .08) RMSEA, SRMR values and high (>.90) CFI and NNFI values.

Table 2. Standardized solutions for factor loadings and error variances for the ISCCS
(Tablo 2. ISCCS'nin factor yükleri ve hata varyansları)

	Items	Factor Loadings	Error Variances
Mental Imagery	1	.47	.78
	11	.50	.75
	21	.76	.43
	31	.60	.64
Effort Expenditure	4	.58	.66
	14	.62	.62
	24	.84	.59
Thought Control	6	.27	.93
	16	.54	.70
	26	.58	.67
	34	.50	.75
Seeking Support	7	.63	.60
	17	.60	.64
	27	.63	.66
	35	.67	.55
Relaxation	8	.58	.67
	18	.63	.61
	28	.70	.51
	36	.77	.40
Logical Analysis	9	.58	.73
	19	.44	.81
	29	.66	.56
	37	.54	.65
Distancing	3	.45	.50
	13	.61	.88
	23	.60	.33
	33	.43	.84
Mental Distraction	5	.56	.69
	15	.70	.50
	25	.50	.61
	39	.43	.81
Venting of Unpleasant Emotions	2	.45	.80
	12	.61	.63
	22	.72	.49
	32	.63	.61
Disengagement	10	.66	.51
	20	.59	.58
	30	.67	.78
	38	.61	.68

Factor loadings of the ISCSS items were between .27 and .84. Standardized factor loadings can be interpreted as estimated Pearson correlations between an indicator and a factor (Kline, 2005). Completely standardized factor loadings of .30 and above are commonly used to operationally define a "salient" factor loading or cross-loading (Brown, 2006).

Cronbach's indexes of internal consistency were calculated for the ICSSC subscales (see Table 3). Relaxation and seeking social support subscales' internal consistency were within reasonable range ($0.70<\alpha<0.80$; Kline, 1998) whereas other subscales' (mental imagery,

effort expenditure, logical analysis, distancing, mental distraction, venting of unpleasant emotions and disengagement) internal consistency was moderate (0.60<α<0.70; Kline,1998). For purposes of comparison, the reliability coefficients (Gaudreau & Blondin, 2002) for the original ten-factor model are listed together with reliability coefficients.

Table 3. Reliability coefficients for the ten factors in the Turkish version and original version of ICSSC.
(Tablo 3. On faktörlü orijinal ve Türkçe formun güvenirlik katsayıları)

Subscales	α	10-factor model (Gaudreau & Blondin, 2002)
Mental Imagery	.65	.74
Effort Expenditure	.64	.79
Thought Control	.61	.73
Seeking Support	.73	.70
Relaxation	.76	.80
Logical Analysis	.62	.67
Distancing	.67	.71
Mental Distraction	.67	.76
Venting of Unpleasent Emotions	.68	.87
Disengagement	.69	.68

Moreover, indicators of reliability, such as internal consistency, the results confirm the existence of Cronbach Alpha values that are reasonable (they varied between .61 to .76). Two of the subscales were showing acceptable and eight subscales showing moderate alpha coefficient, however, in the original form eight subscales showing acceptable alpha coefficient and two subscales showing moderate alpha coefficient. But there aren't extreme differences between original form and Turkish version based on internal consistency. So, when the internal consistency of the complete scale is checked, internal consistencies were within acceptable range. Devellis (1991) has suggested that although alpha values below .60 are generally considered unacceptable.
Inter-scales correlations were provided as part of the confirmatory factor analysis (Table 4).

Table 4. Correlations between the subscales of ISCCS
(Tablo 4. ISCCS alt ölçekleri arasındaki korelasyonlar)

		1	2	3	4	5	6	7	8	9
1.Mental Imagery		1								
2.Effort Expenditure	r p	.82 .04	1							
3.Thought Control	r p	.84 .04	.72 .05	1						
4.Seeking Support	r p	.33 .05	.18 .06	.58 .05	1					
5.Relaxation	r p	.34 .05	.31 .05	.60 .05	.36 .05	1				
6.Logical Analysis	r p	.84 .04	.76 .04	.77 .05	.52 .05	.51 .05	1			
7.Distancing	r p	- .06 .05	- .11 .06	.07 .06	.03 .05	.20 .05	.02 .06	1		
8.Mental Distraction	r p	.05 .06	- .10 .06	.45 .06	.49 .05	.37 .05	.08 .06	.32 .05	1	
9.Venting of Unpleasant Emotion	r p	.03 .06	.02 .06	.11 .06	.24 .05	.17 .05	.16 .06	.39 .05	.33 .05	1
10. Disengagement	r p	- .57 .04	- .65 .04	- .33 .06	.10 .06	- .10 .05	- .35 .05	.43 .05	.42 .05	.42 .05

In the original form significant positive correlations were observed between thought control, mental imagery, relaxation, effort expenditure, seeking social support, and logical analysis (range between .21 and .74). Also, significant positive correlations were observed between social withdrawal, disengagement/resignation, mental distraction, and venting of unpleasant emotion (range between .18 and .48). As stated Table 4, same significant positive correlations were observed in present study.

Inter-scale correlations were found moderately positive. According to Klein (2005), if the correlation between the two factors is equal to 1.0 (higher than .85), then the two factors are identical, which is the same thing as replacing both factors with just one. In present study inter-scale correlations were in an acceptable range.

5. CONCLUSION AND RECCOMENDATIONS (SONUÇ VE ÖNERİLER)

The purpose of the present study was to determine whether the Turkish version of the ISCCS resembled the original version of the ISCSS. In conclusion, the present study support to the factorial validity of original ten factor model of ISCSS. The Turkish version of ISCSS can be used for the assessment of athletes' coping strategies in both individual and team sports but more validation studies are required to evaluate the results are invariant across gender, sport type and competitive levels.

A methodological limitation of the present study is that retrospective data were used. There is some support that athletes can reliably recall pre-competition anxiety levels related to competitions in which they have participated before (Wilson, Raglin, & Harger, 2000). However, failures of memory can influence the results.

The other limitation of this study didn't provide a description of the models in variety samples such as participation level (elit vs non-elite), competition type (individual vs. Team). Future research should assess whether the factorial structure of the ISCCS is invariant

samples like CSAI-2 (Martens, et al. 1990; Cox, Martens, & Russel, 2003; Lundqvist & Hassmen, 2005).

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