

Validity and Reliability the test of performance strategies (TOPS) for Iranian adult athletes

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Abstract: The test of performance strategies (TOPS) is a capable test appraising the most important psychological factors in exercise and competition. The purpose of this study is to investigate validity and reliability the test of performance strategies (TOPS) in the Iranian adult athletes. This test for the first time was designed by Thomas et al. (1999) to estimate the most important psychological factors including competition and practice. This test was constructed based on the scientific research and results that were obtained from the current psychological questionnaires. TOPS were gradually reviewed and changed in different years and different points of the world. In the current study was used the latest test version including 8 and 9 factors for practice and competition respectively. In the present study 259 subjects that they had been selected from the Iranian adult athletes, have completed this questionnaire. These athletes (Mean age: 25.32 years old) were male and female athletes of varying ability levels (7 levels) from 19 different sports. The confirmatory factor analysis and internal consistency (Cronbach's alpha method) were used to compute the TOPS's confirmatory factorial validity and reliability, respectively. Based on the confirmatory factor analysis, the validity of the TOPS was justified (17 factors that include 66 statements). Reliability of competition (0.73) and reliability of practice (0.74) were obtained from the extracted factors (8 factors related to exercise and 9 factors were related to the competition). So, TOPS can be used for appraising the most important psychological factors in Iranian adult athletes.

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Introduction:

Athletes are special group of community which in addition to enhance of physical demands and also achieving required skills for study field in the form of physical exercise, the psychological aspects are also needed. Several studies have shown the importance of mental skills in performance of athletes (11) and in fact, the mental skills of interacting with each other to determine mental status of the individual in different situations. Learning to control psychological skills would help individuals to control their mental status and control themselves in its various circumstances (6, 12). So the mental control will improve level of physical activity in athletes (13). Since the psychological aspects are not directly observable, tools are needed to assess these characteristics (19). In this regard, a method to evaluate the mental skills of athletes is use of psychological questionnaires (16), but using such tools, mainly depends on their psychometric characteristics (7, 18). If validity and reliability has not been proven clearly, acceptance and use of information obtained from such assessments would be problematic (9). A significant part of the research related to sports psychology has dedicated to construct and evaluate the validity and reliability of these tools. For example: Validity and reliability of mental toughness in sport (14), Ottawa Mental Skills

Assessment Questionnaire (5) and self talk questionnaire in sport (20). One of the most important tools in the field of psychological assessment strategies is test of performance strategies (TOPS). TOPS has been designed for evaluating a wide range of skills and psychological techniques and strategies used by athletes during competition and training (11). This test, first was designed by Thomas, Murphy & Hardy in 1999, was established based on psychological processes which are essential for successful athletic performance during competition and training (15). Initial test has 68 questions; each of the four questions was measured one subscale. This test consists of 8 competitive subscale including Goal setting, Relaxation, Activation, Imagery, Self talk, Emotional control, Negative thinking and Automaticity and 8 training subscale were similar with competitive subscale, except for the negative thinking which were replaced by Attentional control in training. To prepare these tests, based on the need to capable tool, a wide variety of surveys and studies were used (15, 17). Several researchers recommended the use of TOPS as selected psychometric tool to assess psychological skills (6, 8, and 10). In research over the next several years, many researchers have worked on TOPS in different communities, and various samples which the obtained results demonstrate the reliability

and validity of the test (7, 8, 9 and 12).

Due to the vital role of psychological skills along with training techniques and fitness and its role in athletic success, this is noteworthy and clear that its impact on the success of the athletes in the world is important (13). This vital issue could help Iranian athletes which despite prolonged physical effort and training; they have not achieved to stand on their dignity. Sports psychologists in developed countries, years-long effort applied to design appropriate questionnaires (15), by the psychological assessment of athletes, tries to identify the strengths and weaknesses of athletes (12). This subject shows the importance of sports psychology training and development in the field and applying appropriate tools for estimating the mental state of the athletes in Iran. In this study, researchers sought to localize the TOPS formidable test together. Based on the strong background of this test, has capability more than other questionnaire in the field of sports psychology.

Research method

Population and statistical sample

The population of the study included all adult male and female athletes of Iran that their 259 patients (randomized) completed the test sample.

Research tools

TOPS, is a 68-item questionnaire that has 9 competitive subscale and there is 8 subscale training and each subscale has 4 items. Overall score test is based on 5-point Likert scale (always 5, most time 4, sometimes 3, rarely 2, never: 1).

Procedure Methods

In order to prepare for the test in Iranian society, original text of exam was translated into Persian language by some specialist. Then, translated test was given to several psychologists and mental health experts in the psychology to investigate psychological terms, in addition to the review of fluent translation of words. In the next step of procedure, the test was translated by another expert group into original language. After verification of translation and in order to the initial evaluation, a preliminary study was performed. Finally after the review of the test, test was prepared to run in the community. 8 specialists in physical education and postgraduate researchers helped as questioner in the research.

Statistical Methods

Descriptive statistics were used to determine that of 259 Iranian adult athletes, who have completed the test, 42.69% of them were women and 57.30% were males. These patients had a mean age of 25.32 years and have 7 different levels of performance and competition. The people were from 10 cities in 19 sports activity.

In this research, to investigate the active structure of the TOPS, in the competition and practice, the

confirmatory factor analysis was used. In this type of analysis, which the aim of researcher is conformation of special active structure, there is a hypothesis about numbers of agents and the fit of the factor structure of the hypothesized covariance structure of the measured variables is monitored (18). Fitness model based on chi-square index, the ratio of chi-square to degrees of freedom, the square root of the estimated variance approximation (RMSEA), non-propriety software index (NNFI) and the comparative fitness index (CFI) is determined. To test the reliability of estimates of TOPS, the Cronbach's alpha was used for data analysis was performed using SPSS, and LISREL.

Results

This study used confirmatory factor analysis (2, 3, 4, 7, 9, 19, 20), special structures made tests to evaluate the validity of the TOPS community studied. First, to estimate the competitiveness subscale items and pay for it, competitive factors in the initial investigation, it was determined that one item (item 58) due to poor factor structure of the items should be removed. After removing these items, again, this factor with the remaining items was examined and all items in this stage, the agent showed a good fit. The output of the results is presented in Figure 1 and 2.

According to Figure 1, all the coefficients of the standard is 0.3 and also significant numbers of $p < 0.01$, greater than 1.96, so it could be concluded that all items listed on the factors that effect.

Table 3- Indicators fitness model competition factor confirmatory factor analysis (N = 259)

Reported Value	Criteria	Index
1365.07	- sig. level: 0.000	Chi-square
2.47	1-3	Q^2/df
0.076	<0.08	(RMSEA)
0.91	>0.80	(NNFI)
0.92	>0.90	(CFI)

Based on Figure 2, all the coefficients of the standard is 0.3 and also significant numbers of $p < 0.01$, greater than 1.96, so it could be concluded that all items listed on the factors that effect. Among which the most important controlling factor was -0.88 and considered by auto, and the least effect was 0.33.

Fitness parameters in Table 3, the fit of the model are emphasized. All values reported in the table as factor confirmatory factor analysis model competitiveness, in terms of their criteria are acceptable.

In the training, we examined its subscale and items. In practice the initial review, it was determined that one item (item 47) due to poor factor structure of the items should be removed. After removing these items, the remaining items were analyzed again with the agent in the interest of all items showed a good fit. The output of the results is presented in Figure 3 and 4.

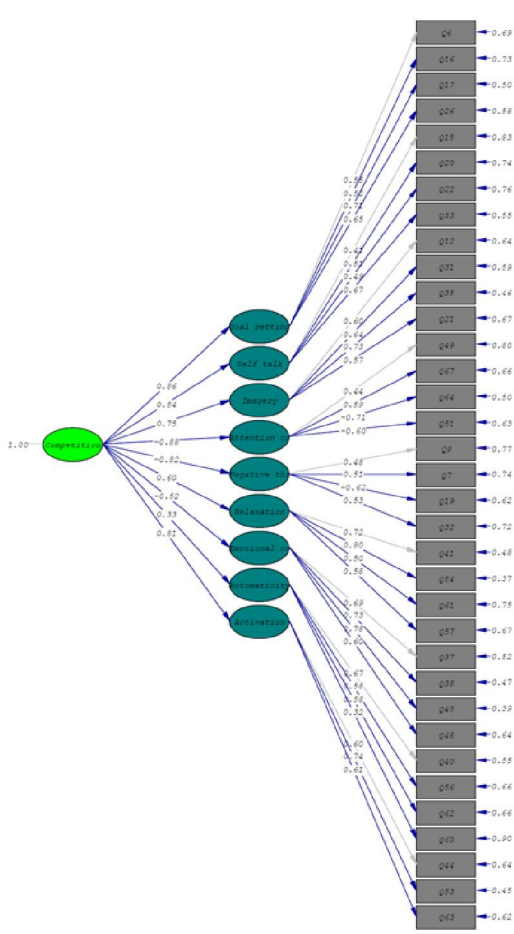


Figure 1 - Model Competition measured in standardized estimates

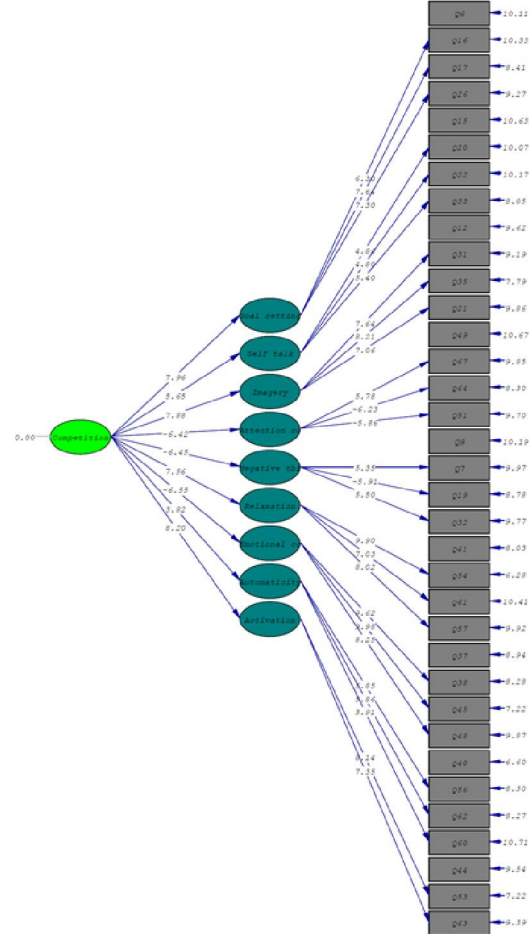


Figure 2 - Measurement of model coefficients are significant numbers of competing

According to Figure 5, all the coefficients of the standard 0.2 are also significant numbers higher than 1.96 can be concluded that the second factor on the competition which of those factors, the target switching to 0.92 of the maximum and the minimum are automatic.

Table 6 - Indicators of the second-order factor analysis model fitness workout (N=259)

Reported Value	Criteria	Index
881.17 – sig. level: 0.000		Chi-square
2.06	1-3	Q^2/df
0.064	<0.08	(RMSEA)
0.90	>0.80	(NNFI)
0.90	>0.90	(CFI)

Considering the suitability parameters listed in Table 6, all index values obtained in the fit of the model and emphasize your criteria is acceptable. To estimate the reliability of this test, the Cronbach's alpha was used (2, 3, 4, 9, 15, 19), the alpha level of each variable and the overall alpha level of competition and practice tests obtained in Tables 4 and 5, respectively.

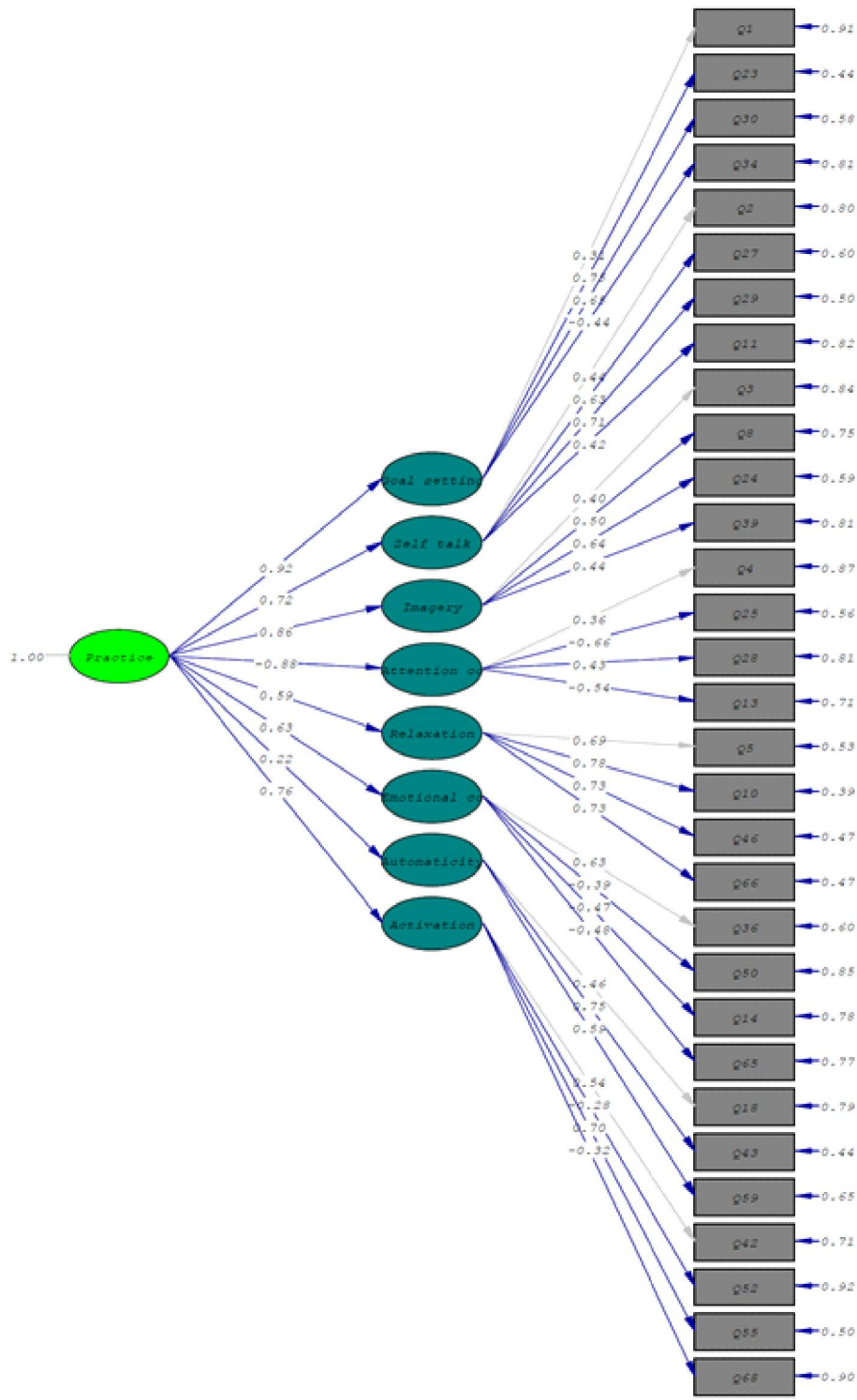
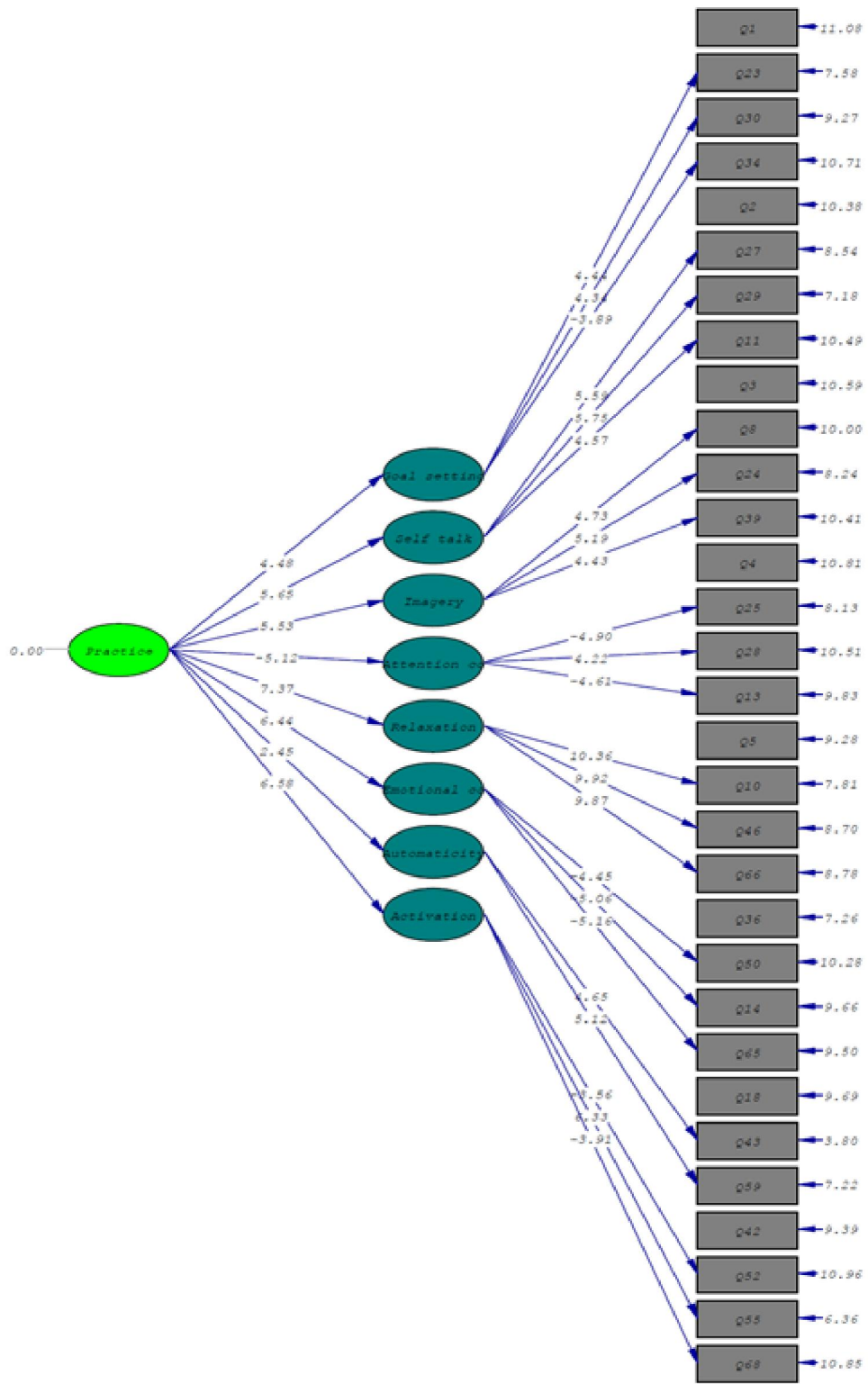


Figure 3 - Model practice measured in standardized estimates



Chi-Square=891.17, df=426, P-value=0.00000, RMSEA=0.064

Figure 4 - Measurement of model coefficients are significant numbers of practicing

Table 4. Cronbach's alpha coefficients for the subscales competition

Cronbach's alpha coefficient	Number of items	Items	Subscales
0.69	4	6, 17, 16, 26	Goal setting
0.63	4	15, 20, 22, 33	Self talk
0.73	4	12, 31, 21, 35	Imagining
0.67	3	63, 53, 44	Activation
0.73	4	41, 54, 61, 57	Relaxation
0.62	4	9, 19, 7, 32	Negative Thinking
0.70	4	49, 51, 64, 67	Focus control
0.80	4	37, 38, 48, 45	Emotions control
0.62	4	40, 56, 62, 60	Self working
0.73	35	9 agent	Reliability of competition items

Table 5. Cronbach's alpha coefficients of the scales of training

Cronbach's alpha coefficient	Number of items	Items	Subscales
0.63	4	2, 29, 11, 27	Self talk
0.62	3	18, 43, 59	Self working
0.61	4	1, 34, 30, 23	Goal setting
0.61	4	55, 68, 42, 52	Activation
0.82	4	5, 46, 66, 10	Relaxation
0.60	4	13, 25, 28, 4	Focus control
0.60	4	36, 50, 14, 65	Emotions control
0.60	4	3, 8, 24, 39	Imagination
0.62	4	40, 56, 62, 60	Reliability of competition items

Based on Figure 3, all the coefficients of the standard is 0.3 and also significant numbers of $p < 0.01$, greater than 1.96, so it could be concluded that all items listed on the factors that effect.

According to the values reported in the table above, the Cronbach's alpha coefficient for each variable is equal to greater than 0.60, and the Cronbach's alpha coefficient of practice is 0.74, the competition factor is 0.73.

Given these values, it can be concluded that the reliability of the test is appropriate.

Range of Cronbach's alpha for all items and variables in the study are among 0.62 to 0.80 and the lowest alpha is related to self working and negative thinking variables and the highest value is related to the emotion's control variable. Inter-correlations among the variables tales of training and 0.60 to 0.82 is the lowest of the maximum relaxation and feelings of control, control is given and illustrated.

Result and discussion

The aim of the present study was to investigate the validity and reliability of performance strategies (TOPS) Society athletes in Iranian adults. TOPS application of psychological skills and strategies will be evaluated in both training and competition. Following the evaluation of several major achievements are: 1) TOPS can be used as a powerful research tool in evaluating the effectiveness of interventions used to improve mental skills. 2) Results TOPS, information for coaches and athletes with the

skills to provide effective psychological. 3) Information from TOPS can be created to determine the main cause of psychological skills; skills that they usually develop during the early stages of development are neglected athletes (12).

In the first study, conducted by Thomas et al (1999), the validity of this test using exploratory factor analysis, was very good, and thus provides a powerful tool for assessing the psychological skills (15). Given the wide scope of this study and also realize the importance of psychological factors in mental skills in athletic performance, the test was considered by investigators (7, 8, 9, 10, 11, 12, 15, 16, 17, 19). In this regard, several studies using confirmatory factor analysis to verify the model tests were conducted in different communities. Based on the results of the present study was to test the validity Latest version operating strategies (TOPS) in the Iranian adult athletes using confirmatory factor analysis, 17 factors and 66 items were approved. In fact, the need for competition and training of all the key factors in Iranian sample confirmed and proved their reliability. Findings of several studies that have been done on this test in different populations, is consistent with (7, 9, 12, 15). Therefore, studies on TOPS, validity and reliability of this test have been approved in various countries, and the term was used in various studies as a reliable instrument. The present results also confirmed the reliability and validity of this test for the possibility of Iranian adult athletes using the test by the group and will provide in both training and competition situation.

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