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THE PSYCHOMETRIC PROPERTIES OF SELF-TALK QUESTIONNAIRE-VIETNAMESE VERSION

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ABSTRACT

The aim of this study was to validate the psychometric properties of Self-talk questionnaire-Vietnamese version, which originally developed by Zervas et al., 2007 (21). For the construct validity, data from 121 collegiate athletes, who studied in Hochiminh City University of Sport, was examined by using factor analysis (exploratory and confirmatory). Like the original Self-talk questionnaire, the results from EFA also pointed out two-factor solution as motivational and cognitive (21). The CFA's results demonstrated that all indices [χ^2 = 46.78, df = 39, χ^2 / df = 1.20, RMSEA = 0.04; SRMR = 0.06; NNFI = 0.97; CFI = 0.98] met the goodness-of-fit standard. The results of Cronbach's alpha coefficient and intra-class correlation coefficient were fully acceptable for a new instrument. In conclusion, the S-TQ Vietnamese version can be used to identify the cognitive and motivational functions of self-talk in Vietnamese athletes.

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KEYWORDS: self-talk / motivational / cognitive / psychometric properties / factor analysis

INTRODUCTION

Self-talk is a cognitive technique that Hackfort and Schwenkmezger (4) defined as "a dialogue (through which) the individual interprets feelings and perceptions, regulates and changes evaluations and convictions, and gives him/herself instructions and reinforcement"

In sport psychology, self-talk has been broadly conceptualized as a "multidimensional phenomenon concerned with athletes' verbalizations that are addressed to themselves" (6). Later, Hardy (5) defined self-talk more specific as "(a) verbalizations or statements addressed to the self; (b) multidimensional in nature; (c) having interpretive elements associated with the content of statements employed; (d) is somewhat dynamic; and (e) serving at least two functions; instructional and motivational, for the athlete". The cognitive (instructional) function was described as athletes' learning and performing of sport skills, and also developing the strategies or tactics of play; while the motivational function mentioned about athletes' concentration, arousal regulation, self-confidence, self-management, mental readiness, and coping skills. Athletes' self-talk which contained verbal statements (cue words, sentences) sometimes functioned either cognitive or motivational.

Sport psychology consultants, coaches, and athletes themselves recommend self-talk as a useful component of most mental training programs to activate cognitions (thoughts) and to enhance sport training and competitive performances. They believe that self-talk is an intervention that enhances sporting performance and various psychological states, such as confidence (19). Previous research on cognitive strategies in athletes has indicated that the more successful athletes use cognitive strategies (i.e., arousal control, concentration techniques, imagery, self-talk, etc.) more often than less-successful athletes (1, 3, 9, and 17). These strategies have been shown to improve an athlete's performance (8).

In brief, self-talk is one of the most common cognitive strategies used by athletes and coaches because it may have the power to enhance athletic performance in sport psychology (2, 16, and 18), and in the sport psychology literature the study of self-talk has been growing steadily (7). Furthermore, self-talk is widely used because "it occurs unconsciously and consciously, and it can be used with or without prior training" (2). The use of self-talk is evident, but more concrete conclusions about its ability to improve or diminish an athlete's performance, is needed. Since self-talk was not stability, it is important to gain information about how athletes use it and how it may influence their sport performance.

In 2007, Yannis Zervas et al. (21) developed the Self-talk questionnaire (S-TQ), which aimed "to examine the nature of self-talk during various situations and performances as well as the causal relationships among self-talk and sport performances". In Vietnam, many talent athletes performed impressive in training, but they still could not reach their full potential in competition due to their negative, irrelevant or outcome-related thoughts. Thus, validation of a reliable instrument such as S-TQ will offer opportunities not only for coaches, consultants, and sport psychologists to enhance athletes' performance, but also for athletes to develop self-intervention program. However, to date, the Self-talk questionnaire-Vietnamese version has not been available. So, the aim of this study was to validate the psychometric properties of Self-talk questionnaire-Vietnamese version.

MATERIALS AND METHODS

Participants

At least 10 participants per item for factor analysis were consider sufficient to generalize from the sample to the population (10). The S-TQ Vietnamese version had 11 items plus 10% to the sample to overcome the problem of missing data, therefore at least 121 participants required (12). By using simple random sample, 121 collegiate athletes (males = 94, females = 27), who were studied in Hochiminh City University of Sport, were recruited to complete the questionnaires. The participant's age were ranged from 19-22 years (M= 19.91, SD = .82), with their competitive experience ranged from 1-6 years (M = 3.31, SD = 1.51), involved in various kind of sports such as: swimming, badminton, judo, karate, aerobic, gymnastic, tennis, football, track-and-field, basketball, volleyball …

Instruments

The 11-items S-TQ questionnaire was employed to access athletes' cognitive and motivational functions of self-talk. The items were assigned with a score ranging from 1 (Never) to 5 (Always) with a mid-point of 3 (Sometimes).

Translation procedures

Three bilinguals, who had education background in applied psychology and sport psychology, translated the S-TQ into Vietnamese language. Then, the S-TQ Vietnamese version was back translated into English. The back-translated version was compared with the original version to find and modify the items with discrepancies between the two language versions. This process was finished until the final version satisfied the semantic equivalence.

Procedures

Participants were recruited voluntary by contact their coaches or athletes themselves after receiving the ethical approval from Burapha University, Thailand. First, athletes were informed about the purpose of study and measurement methodology. Then, they completed the consent forms, demographic information forms, and S-TQ Vietnamese version. It took 10 minutes to complete the questionnaire. For test-retest reliability, a sample of 30 participants completed the S-TQ twice, with a two-weeks interval.

Statistic analysis

Data was initially examined for multivariate normal distribution via measurement of skewness and kurtosis. Descriptive analysis was computed for mean, frequencies, and standard deviation. Content validity index, Cronbach's alpha coefficient and intra-class correlation coefficient (IR) were used to examine the content, internal consistency and reliability of instrument, respectively.

An exploratory factor analysis (EFA) was selected to explore factors or dimensions underlying the relationship between observed and latent variables by Statistical Package for Social Science (SPSS 16.0), while confirmatory factor analysis (CFA) was chosen to confirm that observed and latent factors or variables of S-TQ Vietnamese version fit the data by using SPSS Amos (AMOS 16.0).

EFA was conducted with a principle component analysis, and orthogonal rotation (varimax rotation) followed the criteria: (1) eigenvalues $\geq$ 1, (2) the percentage of total variance explained by each factor, and (3) factor loading cutoff of 4.0 (15).

Five goodness-of-fit indices including: the chi-square (χ^2), the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), non-normed fit index (NNFI), and comparative fit index (CFI) were examined by using CFA. The values of χ^2 must be low and non-significant, RMSEA smaller than 0.10 are acceptable, while SRMR < 0.08, NNFI > 0.90, and CFI > 0.90 indicate a good fit with the model (13).

RESULTS

The values of skewness ranged from -1.428 to .212 and kurtosis ranged from -0.755 to 1.482, which completely satisfied the normality distribution requirement (skewness < 2, kurtosis < 7, West et al. (20)).

Exploratory factor analysis

The results pointed out two-factor solution (eigenvalues of 3.75 and 2.40) accounted for 55.89 % of total variance. Factor 1 was named as "Motivational", factor loadings ranged from 0.64 to 0.78, explained 31.39% of total explained variance. Factor 2 was named as "Cognitive", factor loadings ranged from 0.79 to 0.82, explained about 24.50% of total explained variance. The first factor contained seven items, and the second factor contained four items, characterizing two difference conceptual constructs (see Table 1).

The Cronbach's alpha coefficient, inter-correlations, inter-item covariance, and item-total correlations were examined for the internal consistency of the S-TQ Vietnamese version. The result of Cronbach's alpha coefficient was 0.83 for both factors. The total S-TQ Vietnamese version Cronbach's alpha coefficient was 0.80, which indicated that all the coefficients were satisfactory. No further problems regarding to the consistency of the factors after inter-correlations, inter-item covariance, and item-total correlations were calculated (see Table 2).

Table 1 *Exploratory Factor Analysis: Factor Loadings, Communalities, Eigenvalues, and Percentage of Explained Variance of the S-TQ Vietnamese version (n = 121)*

S-TQ items	Factor loadings		Communalities
	Factor 1	Factor 2	
Technical elements of the competition		0.82	0.67
Correct my mistakes		0.81	0.67
Concentrate more fully on the competition		0.80	0.65
Give directions		0.79	0.64
Help myself to relax	0.78		0.61
Encourage myself	0.72		0.51
Motivate myself	0.70		0.49
Strengthen a positive thought	0.70		0.49
Stop negative thinking	0.69		0.52
Increase my effort	0.66		0.48
Enhance my self-confidence	0.64		0.42
Eigenvalues	3.75	2.40	
% explained variance	31.39	24.50	

Note.   Factor loadings < 0.40 are not reported in the table

Table 2 *Internal Consistency Indices (Mean, Minimum Value, Maximum Value) for the 11-item S-TQ Vietnamese version (n = 121)*

S-TQ	Items means (Min-Max)	Items variances (Min-Max)	Inter-item correlations (Min-Max)	Items-total correlations (Min-Max)	α Cronbach
Motivational	3.84 (3.83 -3.86)	0.44 (0.43-0.45)	0.54 (0.47-0.61)	0.65 (0.64-0.66)	0.83
Cognitive	4.41 (4.27-4.57)	.60 (0.40-0.82)	0.41 (.30-6.00)	0.57 (0.52-0.66)	0.83

Note.   Total Cronbach's alpha coefficient was 0.80

Confirmatory factor analysis

The values of all indices [χ^2 = 46.78, *df* = 39, χ^2 / *df* = 1.20, RMSEA = 0.04; SRMR = 0.06; NNFI = 0.97; CFI = 0.98] not only met the goodness-of-fit standards, but also indicated that the two-factor model was well fitted for Vietnamese elite athletes (see Figure 1).

Test-retest reliability

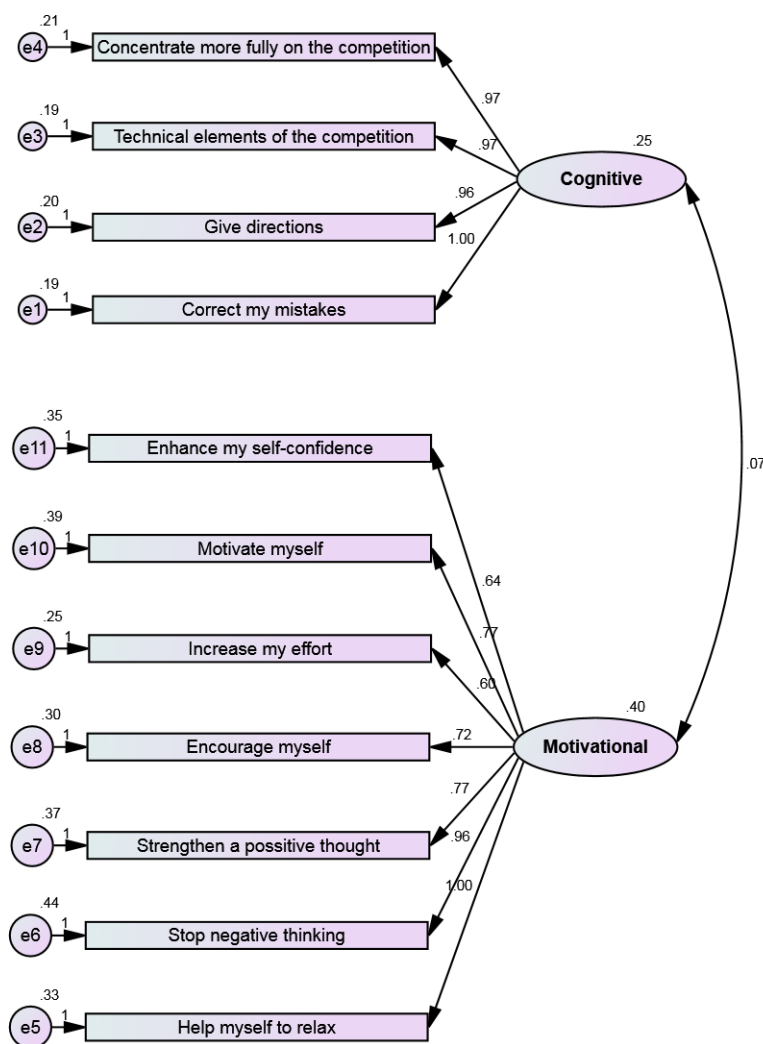The results of intra-class correlation coefficient were IR = 0.98; p < .001, 95% CI: 0.97 - 0.99.

Figure 1. Confirmatory factor analysis: Factor loadings and error variances of the 11-items of the S-TQ Vietnamese version

DISCUSSION

The original S-TQ was successfully translated into Vietnamese language by using back-translation method. The psychometric properties of S-TQ Vietnamese version were evaluated through validity and reliability.

The construct validity of S-TQ Vietnamese version was examined through data from 121 collegiate athletes, who completed the questionnaire, by using factor analysis (exploratory and confirmatory). Like the original S-TQ, the results from EFA also pointed out two-factor solution as motivational and cognitive (21). This meant that factorial structure was fairly consistent. However, according to Schuyler (13), the EFA could not be used to confirm factor structure because EFA was a theory-generating activity whereas CFA is theory-testing endeavor. So, CFA was conducted to identify the hypothesized factor structure of the S-TQ Vietnamese version from EFA fit the data. The CFA's results demonstrated that all indices [χ^2 = 46.78, *df* = 39, χ^2 / *df* =

1.20, RMSEA = 0.04; SRMR = 0.06; NNFI = 0.97; CFI = 0.98] not only met the goodness-of-fit standards, but also indicated that the two-factor model was well fitted for Vietnamese athletes.

The Cronbach's alpha coefficient was 0.80, which indicated that the S-TQ Vietnamese version was satisfied all the coefficients of internal consistency (11). Furthermore, due to Streiner and Norman (14), the result of ICC for the test-retest with a two-week interval was fully accepted for a new instrument (IR = 0.98; p < 0.001, 95% CI: 0.97 - 0.99, acceptance ranged > 0.75).

CONCLUSION

With appropriate psychometric properties, the S-TQ Vietnamese version can be used to identify the cognitive and motivational functions of self-talk in Vietnamese athletes. Future research should examine the relationship between self-talk and variety of populations, cultures, and sports.

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