

RELIABILITY OF TEST OF PERFORMANCE STRATEGIES- COMPETITION SCALE (TOPS-CS) AMONG YOUTH ATHLETES: A PRELIMINARY STUDY IN MALAYSIA

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Abstract: Numerous past studies have conducted psychology assessment to embark athlete psychology performance. Psychology skill is part of essential skill that must be possessed by the successful youth athletes. The aim of this study was to examine the content validity of the Test of performance strategies – Competition Scale (TOPS-CS) in Malaysia youth athlete. TOPS-CS containing eight subscale – self talk, activation, emotional control, goal setting, imagery, negative thinking, relaxation and automaticity, with four items evaluate for each subscale. The 32-items of TOPS-CS was adopted and back translated in Malay language. Malaysia youth athletes ($n = 79$) aged 13 to 18 years old completed the 32-items competition subscale during competition week. Factor analyses were conducted to achieve the objective of the current study. The result shows five of the eight subscales showed adequate internal consistency. Activation, emotional control and relaxation subscale demonstrated poor and inadequate internal consistency. In a nutshell, TOPS-CS can be used in Malaysian youth athlete population, however, the psychometric properties of activation, emotional control and relaxation subscale are questionable at present thus further research is required.

INTRODUCTION

Various psychology skill inventories had been introduced to athletes to evaluating their psychological skill. These psychology assessments are vital requirement for any neither individual nor team sport. However, the demands may be vary for each sport category as well as type of the sport itself (Abdullah, 2016). Successful athletes are tent to possess good psychological skill because of they attempted to use mental skill efficiently (Frey, Laguna, 2003). Likewise, physical and psychological factor are interrelated to each other and physical performance alone could not determine the performance of elite soccer athlete (Abdullah, 2016a). Somehow, successful athlete lean to owned high level of confident, concentration and regulate arousal efficiently (Gould et al., 1994) and frequently manage to use goal setting and imagery (Jones, Hanton, & Connaughton, 2002) as well as possessed optimal motivation and commitment (Gould, Dieffenbach & Moffett, 2002).

Thomas, Murphy, and Hardy (1999) produced an inventory, the Test of Performance Strategies (TOPS), established upon psychological processes that are vital for effective athletic act. A study piloted TOPS in small sample among male soccer player found out that higher used of relaxation strategies during competition

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was correlated with higher levels of self efficacy (Lowther, Lane & Lane, 2002).

TOPS is a self-report tool with 64-items proposed to quantify the psychological skills and strategies used by athletes in competition and for the period of practice. It consists of two scales, competition and practice. Both scales are contained of eight subscales. The 8 competition subscales are: self-talk (upholding a optimistic internal dialogue), emotional control (governing emotions in pressure), automaticity (acting with slight conscious effort, spontaneously), goal setting (setting personal, particular goals), imagery (visualizing sport performance), activation (sustaining an ideal level of arousal), relaxation (practicing to stay calm under pressure), and negative thinking (thoughts of failure). The practice subscales are the similar excluding negative thinking which is substituted by attentional control (concentrating attention effectively).

The TOPS-CS was developed to investigate the use of psychological skill and strategies by athletes during competition (Thomas, Murphy, & Hardy, 1999). It is comprised of 32 items which assembling eight subscale, namely: goal setting, self-talk, emotional control, automaticity, imagery, relaxation, activation and negative thinking. Each subscale is consisting of four items. Five point Likert scale ranging from 1 (never) to 5 (always) were given as the answer.

The TOPS has grown into one of the most common investigations in sport psychology (Weinberg & Gould, 2003), with very capable subscales (Bond & Sargent, 2004). The preliminary analyses reported by Thomas et al. (1999) displayed that the subscales had worthy construct validity, which is also obvious from consequent research.

But this psychological skill inventories English version, can be used only by the person who knows English, even though nonnative English speakers using this scale the level of understanding about the inventories English version also poor which again affects the outcome of an assessment. So translating this inventories from English to the participant mother tongue will enhance the quality of assessment and also helpful to assess the non-English speaking person. Content validity of the scale and alpha value for English version for self-talk, emotional control, automaticity, goal-setting, imagery, activation, relaxation, and negative thinking are 0.8, 0.79, 0.74, 0.78, 0.79, 0.76, 0.8 and 0.74 respectively (Thomas, Murphy, & Hardy, 1999).

In previous several years, many investigators have slogged on TOPS in different populations and various samples (Dachen, 2012) that the obtained results demonstrate the reliability and validity of the test. The inventory were also underwent back translation in Persian language (Saadatifard, Keshtidar, & Khoshbakhti 2014) and Greek language (Donti, Katsikas, & Psychountaki, 2006; Donty & Katsikas, 2014; Gaudas, Kontou, & Theodorakis, 2006). The researcher agreed to suggest ToPS inventory is the appropriate tool for assessing psychological skill of the athlete (Saadatifard, Keshtidar, & Khoshbakhti 2014; Donty & Katsikas, 2014). Nonetheless, elimination of automaticity as part of the inventory subscale

will contribute the better inventory (Jackson, Thomas, Marsh, & Smethurs, 2001; Donty & Katsikas, 2014). The findings are dissimilar to each other even though the inventory are well translated but still not achieve internal consistency after translated to other language. The root problem is some terms are inappropriate for young athlete understanding (Lane, Harwood, Terry, & Karageorghis, 2004). Thus, this present study aims to examine the content validity of the Test of performance strategies – Competition Scale (TOPS-CS) in Malaysia youth athlete.

METHOD

Participant

A total of 79 male athletes, aged 13 to 18 years old volunteered participated in this study were drawn from Malaysia sport school. The athletes were training under sports development program and had to have at least three years of competitive experience. Participant were informed there were no right and wrong answer for all the statement, included a reminder to respond to all the items. This inventory distributed to the athletes during competition week. The athletes provided informed consent form to take part in this study. Written parental and guidance consent for athletes participating in this study were also provided. The instruction given by the tester included reminder to answer all the items and there are no right or wrong answer. The participant responded the inventory during competition week.

Organizations of the Test

For the translation of the TOPS-CS into Malay language, three interpreters conducted a back and forth translation which specialized in sport psychology. The inventory was translated to Malay language using back-translation method (Brislin, 1970).

Data Analysis

Cronbach Alpha's Coefficient was used in this study to validate the reliability and internal consistency of the items in the instrument. ToPS-CS was analyses separately according to each subscale. Kuder Richardson and Cronbach's Alpha method implemented in this study as this is the commonly used technique to evaluate the internal consistency (Junninen et al., 2004) Cronbach's alpha reliability coefficient usually ranges between 0 and 1. Nonetheless, there is essentially no lower limit to the coefficient. The nearer Cronbach's alpha coefficient is to 1.0 the greater the internal consistency of the items in the scale.

Based on the equation 1:

$$rk/[1 + (k - 1) r] \quad (1)$$

Where k is the quantity of the items considered and r is the mean of the inter item coefficients the size of alpha is determined by equally the number of items in the scale and the mean inter item correlations. The gradation of Cronbach Alpha

(α) scale used in this study was recommended by prior researchers (George and Mallery, 2003, Nunnally, Bernstein, & Berge, 1967) in their study by following rules of thumb:

(> 0.9 = Excellent; > 0.8 = Good; > 0.7 = Acceptable; > 0.6 = Questionable; > 0.5 = Poor, and < 0.5 = Unacceptable)

While increasing the value of alpha is partly dependent upon the number of constructs in the scale, it should be notable that this has diminishing returns. It should also be notable that an alpha of 0.8 is probably a reasonable goal. It should also be illustrious that while a greater value for Cronbach's alpha (α) specifies good internal reliability of the items in the range, it does not mean that the range is unidimensional. Factor analysis is a technique to define the dimensionality of a scale but it is beyond the scope of this paper. However, early studies suggested that alpha value of 0.6 is acceptable for the construct that contains only four items (Leowenthal, 2001).

For all statistical analysis, SPSS software (Statistical Package for Social Science) version 20.0 and XLSTAT 2014 add-in software for Windows were used to meet the objective. All the data were statistical projected separately by type of sports and gender category based on the approach of the orientation.

RESULT

The Cronbach's alpha values for competition subscale ranged from 0.62 to 0.74 excluded the automaticity, emotional control and relaxation which demonstrated low Cronbach's alpha value, 0.512, 0.457 and 0.545 respectively. The criterion of the Cronbach's alpha value that universally used for internal consistency is an alpha of 0.7. However, Leowenthal (2001) suggested an alpha of 0.6 is acceptable for four items subscale. The highest Cronbach's alpha value among all the subscale is self-talk with the alpha value 0.744, followed by goal setting, imagery, activation, and negative thinking with the alpha value 0.728, 0.673, 0.667, and 0.619 respectively (Table 1).

TABLE 1: THE TABLE PRESENTS THE RESULT OF ALPHA VALUE OF TOPS-CS SUBSCALE

<i>Subscale</i>	<i>Cronbach's Alpha</i>
Goal setting	0.728
Automaticity	0.512
Emotional control	0.457
Imagery	0.673
Activation	0.667
Self-talk	0.744
Relaxation	0.545
Negative thinking	0.619

Reliability analysis test were conducted to determine the destructible items that influence the consistency of subscale. If the Cronbach's alpha of the subscale is higher than the item, the item will retain or vice versa. The result of reliability shows that all the subscale's Cronbach's alpha value is slightly higher than Cronbach's alpha if item deleted. Consequence, the items in the each subscale will retain and there is insufficient evidence to remove the items for the subscale. The finding indicates that the low alpha of subscale value was not affected by destructed item.

TABLE 2: THE TABLE PRESENTS THE RESULT OF ALPHA IF ITEM DELETED

<i>Subscale/ Items</i>	<i>Cronbach's Alpha if item deleted</i>
<i>Goal Setting</i>	
I set very specific goals for competition.	0.699
I set personal performance goals for competition.	0.584
During competition I set specific goals for myself.	0.609
I evaluate whether I achieve my competition goals.	0.720
<i>Automaticity</i>	
During competition, I don't think about performing much—I just let it happen	0.382
During competition I perform on "automatic pilot."	0.288
*During competition I play/perform instinctively with little conscious effort.	0.205
I perform at competitions without consciously thinking about it	0.341
<i>Emotional control</i>	
My emotions keep me from performing my best at competitions.	0.415
My emotions get out of control under the pressure of competition	0.285
When something upsets me during a competition, my performance suffers	0.328
When I make a mistake in competition, I have trouble getting my concentration back on track.	0.431
<i>Imagery</i>	
I rehearse my performance in my mind at competitions.	0.504
I imagine my competitive routine before I do it at a competition.	0.575
At competitions; I rehearse the feel of my performance in my imagination	0.560
I visualize my competition going exactly the way I want it to go.	0.592
<i>Activation</i>	
I do what needs to be done to get psyched up for competitions.	0.513
I psych myself up at competitions to get ready to perform.	0.461
I can increase my energy level to just the right level for competitions.	0.435
I can raise my energy level at competitions when necessary.	0.550

<i>Subscale/ Items</i>	<i>Cronbach's Alpha if item deleted</i>
<i>Self-talk</i>	
I say things to myself to help my competitive performances.	0.631
I manage my self-talk effectively during competition.	0.632
I have specific cue words or phrases that I say to myself to help my performance during competition	0.644
I talk positively to myself to get the most out of competitions.	0.676
<i>Relaxation</i>	
I am able to relax if I get too nervous at a competition.	0.294
When I need to, I can relax myself at competition to get ready to perform.	0.486
When the pressure is on at competitions, I know how to relax.	0.331
I find it difficult to relax when I feel too tense at competition.	0.627
<i>Negative thinking</i>	
My self-talk during competition is negative.	0.590
I keep my thoughts positive during competition.	0.631
During competition I have thoughts of failure.	0.588
I imagine screwing up during competition.	0.373

DISCUSSION

The aim of this study was to examine the content validity of the Test of performance strategies – Competition Scale (TOPS-CS) among Malaysia youth athlete. Based on the result mentioned before, only five subscale that shows adequacy of alpha value (>0.6) while remaining three subscale shows inadequacy of alpha value. Selection of the lowest alpha value were recommended by Leowenthal (2001) is 0.6 since only four items represent for each subscale. It is concluded that ToPS-CS are acceptable to be used in Malaysia athletic population, nevertheless, the automaticity, emotional control and relaxation subscale are debatable at present and supplementary investigation is requisite. Previous study reported that automaticity need to re-examination (Hardy et al., 2010). Automaticity is commonly conducted in psychological skill training to enhance athlete performance during competition and help athletes to achieve automaticity (Thomas, Murphy, & Hardy, 1999) nonetheless, technical skill applied in different sport necessitated special level of “automatically”. In addition, findings for each item were also displayed low Cronbach’s alpha value.

Coping with adversity is a crucial factor in fruitful athletic performance (Smith, 1995). The capability to deal with frustration and negative passions is important for competitive athletes (Cohen, Tenenbaum, & English, 2006). Parallel with finding reported by Thomas and Over (1994), the athlete who can manage negative

emotions and cognitions effectively have advantage to improve their performance during competition. The effects of lacking of managing particular emotions toward athletic performance are well established in sport psychology literature (Jones & Hardy, 1990). However the present study shows low Cronbach's alpha value (alpha = 0.457) for emotional subscale as well the Cronbach's alpha if the item deleted. This is mean that internal consistency of the subscale is insufficient to be achieved. But, previous study reported that emotional control subscale have adequate internal consistency with alpha of 0.79 (Thomas, Murphy, & Hardy, 1999) and 0.799 (Donti & Katsikas, 2014). Thus this subscale need to be revise and foster investigation should be done.

The third subscale found to have low alpha value is relaxation subscale (alpha = 0.545). Arousal control can be subdivided into relaxation and activation. It is recognized as essential psychological skill in sport performance. However, earlier devastation study narrated there is insufficient evidence to conclude that decreasing high physiological arousal skill is similar skill to increasing it (Hardy, 1990; Hardy & Parfitt, 1991). Therefore, both relaxation and activation subscale are viewed as separate skill. The Cronbach's alpha of relaxation subscale shows insufficient contain consistency with alpha value 0.545 while activation subscale have adequate alpha value with alpha value 0.667.

For the purpose of this research, all the items were re-paraphrased in Malay version of the inventory perhaps confusing the participant in interpreting the items (Hardy, Roberts, Thomas, & Murphy, 2010). Moreover, the participant maybe misinterpreting the item because of the language level is too complicated to them (Katsikas, Argeitaki & Smirniotou, 2009). In instant, three subscale need to re-revise and remaining five subscales are retained. Hence, conclusions on TOPS, validity and reliability of this psychological skill inventory have been accepted in diverse countries and the term was used in various studies as a reliable instrument. The current outcomes also confirmed the reliability and validity of this test for the possibility of Malaysian youth athletes using the test by the group and will provide in competition situation, again suggesting that three subscale; automaticity, emotional control and relaxation, demand supplementary consideration.

References

- Abdullah, M. R., Musa, R. M., Maliki, A. B. H. M., Suppiah, P. K., & Kosni, N. A. (2016). Relationship of physical characteristics, mastery and readiness to perform with position of elite soccer players. *International Journal of Advanced Engineering and Applied Sciences*, 4, 8-11.
- Abdullah, M. R., Musa, R. M., Maliki, A. B. H. M., Kosni, N. A., & Suppiah, P. K. (2016a). Role of psychological factors on the performance of elite soccer players. *Journal of Physical Education and Sport*, 16(1), 170-6.

- Bond, J. & Sargent, G. 2004. Concentration skills in sport: An applied perspective. In T. Morris & J. Summer (Eds.). *Sport Psychology: Theory, application, and issue* (2nd ed.). Australia: Brisbane: John Wiley & Sons. pp. 388-422.
- Brislin, R. W. 1970. Back-translation for cross-cultural research. *Journal of cross-cultural psychology*, 1(3), 185-216.
- Cohen, A., Tenenbaum, G., & English, R. W. 2006. Emotions and golf performance. An IZOF-Based applied sport psychology case study. *Behavior Modification* 30, 259-280.
- Dachen, J. 2012. Test of performance strategies among college going athletes: Differences across type of sports and gender. *International Journal of Behavioral Social and Movement Sciences*. 1, 139-147.
- Donti, O., & Katsikas, C. 2014. Factorial validity of the test of performance strategies -2 competition scale (tops 2-cs) in Greek athletic population. *Biology of Exercise*, 10(1), 13-22.
- Donti, O., Katsikas, C., & Psychountaki, M. 2006. Reliability and Validity of the Greek version of the TOPS in Greek athletic population. *Athlitiki Psychologia*, 17, 69-79.
- Frey, M., Laguna, P., & Ravizza, K. 2003. Collegiate athletes' mental skill use and perceptions of success: An exploration of the practice and competition settings. *Journal of Applied Sport Psychology*, 15(2), 115-128.
- George, D., & Mallery, M. 2003. Using SPSS for Windows step by step: a simple guide and reference.
- Goudas, M., Kontou, M.G., and Theodorakis, Y. 2006. Validity and reliability of the Greek version of the test of performance strategies (TOPS) for athletes with disabilities. *Japanese Journal of Adapted Sport Science*, 4(1): 29-36.
- Gould, D., Dieffenbach, K., & Moffett, A. 2002. Psychological characteristics and their development in Olympic champions. *Journal of Applied Sport Psychology*, 14, 172-204.
- Gould, D., & Udry, E. 1994. Psychological skill for enhancing performance: Arousal regulation strategies. *Medicine and Science in Sports and Exercise*, 26, 478-485.
- Hardy, L. (1990). A catastrophe model of performance in sport. In *Stress and Performance in Sport* (edited by G. Jones and L. Hardy), pp. 81-106. Chichester: Wiley.
- Hardy, L. and Parfitt, G. (1991). A catastrophe model of anxiety and performance. *British Journal of Psychology*, 82, 163-178.
- Hardy, L., Roberts, R., Thomas, P. R., & Murphy, S. M. (2010). Test of Performance Strategies (TOPS): Instrument refinement using confirmatory factor analysis. *Psychology of Sport and Exercise*, 11(1), 27-35.
- Jackson, S. A., Thomas, P.R., Marsh, H. M., and Smethurst, C. H. J. 2001. Relationships between flow, self-concept, psychological skills and performance. *Journal of Applied Sport Psychology*, 13, 129-153.
- Jones, G. & Hardy, L. (eds) (1990). *Stress and Performance in Sport*. Chichester: Wiley.
- Jones, G., Hanton, S., & Connaughton, D. 2002. What is this thing called mental toughness? An investigation of elite sport performers. *Journal of Applied Sport Psychology*, 14, 205-218.
- Junninen, H., Niska, H., Tuppurainen, K., Ruuskanen, J., & Kolehmainen, M. (2004). Methods for imputation of missing values in air quality data sets. *Atmospheric Environment*, 38(18), 2895-2907.
- Katsikas, C., Argeitaki, P., & Smirniotou, A. 2009. Performance strategies of Greek track and field athletes: gender and level differences. *Biology of Exercise*, 5(1), 29-38.

- Lane, A. M., Harwood, C., Terry, P. C., & Karageorghis, C. I. 2004. Confirmatory factor analysis of the test of performance strategies (TOPS) among adolescent athletes. *Journal of Sports Sciences*, 22(9), 803-812.
- Loewenthal, K. M. 2001. An introduction to psychological tests and scales (2nd ed.). London: UCL Press, p. 87.
- Lowther, J., Lane, A., & Lane, H. (2002). Self-efficacy and psychological skills during the amputee soccer world cup. *Athletic Insight (On-Line)*, 4.
- Nunnally, J. C., Bernstein, I. H., & Berge, J. M. T. (1967). *Psychometric Theory* (Vol. 226). New York: McGraw-Hill.
- Saadatifard, E., Keshtidar, M., & Khoshbakhti, J. (2014). Is Test of Performance Strategies (TOPS) a Precise Tool for Iranian Adult Athletes?. *Middle-East Journal of Scientific Research*, 22(8), 1219-1227.
- Smith, R.E., Schutz, R.W., Smoll, F.L., & Ptacek, J.T. (1995). Development and validation of a multidimensional measure of sport-specific psychological skills: The Athletic Coping Skills Inventory-28. *Journal of Sport and Exercise Psychology*, 17, 379-398.
- Thomas, P. R., & Over, R. (1994). Psychological and psychomotor skills associated with performance in golf. *The Sport Psychologist*, 8, 73-86.
- Thomas, P.R., Murphy, S.M., & Hardy, L. 1999. Test of performance strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. *Journal of Sports Sciences*, 17, 697-711.
- Weinberg, R. S., & Gould, D. (2003). Introduction to psychological skills training. *Foundations of sport and exercise psychology*.

