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Psychometric properties of the sport stress coping styles scale

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Abstract
This study was aimed to investigate psychometric properties of the Sport Stress Coping Styles Scale (SSCSS) in a sample of Iranian athletes. 452 athletes (288 males, 164 females) were asked to complete the SSCSS, the COPE inventory (Carver, Scheier, & Weintraub, 1989), the Multidimensional Competitive Anxiety Questionnaire (MCAQ; Besharat, 2009), and the Mental Health Inventory (MHI; Veit & Ware, 1983). Findings supported four-factor structure of the SSCSS as well as its reliability and Concurrent, convergent, and discriminant validity. It can be concluded that the SSCSS is a valid instrument for measuring the way athletes cope with sport stresses.

Keywords: Sport stress coping styles scale; confirmatory factor analysis; reliability; validity; sport psychology.

1. Introduction

Coping research is characterized by a plethora of diverse theoretical models and measurement instruments (e.g., Lazarus & Folkman, 1984; Skinner, Edge, Altman, & Sherwood, 2003). Theory and research generally posit two main coping styles, including approach- and avoidance-specific responses as well as two main coping strategies, including problem- and emotion-specific responses (e.g., Anshel, Kim, Kim, Chang, & Eom, 2001; Hoar, Kowalski, Gaudreau, & Croker, 2006; Lazarus & Folkman, 1984; Poczwardowski & Conroy, 2002; Skinner et al., 2003). Coping styles have been defined as “methods of coping that characterize individuals’ reactions to stress either across different situations or over time within a given situation” (Compas, 1987, p. 349). Coping strategies, on the other hand, are the situational use of coping techniques to reduce external demands or improve internal resources in dealing with unpleasant events (Poczwardowski & Conroy, 2002). Therefore, styles reflect the individual’s more stable and consistent form of using similar types of coping strategies, whereas strategies reflect situational responses to specific stressors (Anshel, Sutarso, & Jubenville, 2009). Accordingly, several coping scales have been developed in the realm of general psychology to measure different coping responses.

Athletes are often exposed to highly stressful events during a competition. Theoretically driven research has suggested that coping strategies are important adaptation processes that can contribute to a better understanding of athletes’ goal attainment (Gaudreau, Blondin, & Lapiere, 2002; Gaudreau, El Ali, & Marivain, 2005) and emotional adjustment (e.g., Ntoumanis, Biddle, & Haddock, 1999). Therefore, growing empirical attention has been devoted to coping process in sport competitions (e.g., Anshel et al., 2009; Richards, 2004). According to Lazarus and Folkman...

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(1984), sport psychologists have defined coping as the behavioral and cognitive efforts of an athlete to manage specific external and/or internal demands associated with sport. Research concerning sport-related coping instruments have proposed several measurement models (e.g., Anshel & Wells, 2000; Anshel, Williams, & Williams, 2000; Gaudreau & Blondin, 2002; Gaudreau, et al., 2005; Kowalski & Crocker, 2001). Based on a four-factor model of coping proposed by Anshel, Williams, and Williams (2000), the main goal of this research was to develop a self-report stress coping scale in sport settings for Iranian athletes. In accordance with previous research findings in coping (e.g., Lazarus & Folkman, 1984; Tobin, Holroyd, Reynolds, & Wigal, 1989) and Anshel’s et al. model of coping (2000), it was decided to include items that reflect four types of coping responses in Sport Stress Coping Styles Scale (SSCSS). These types of coping were selected to represent the main coping styles and strategies: (a) task-focused approach (e.g., physical confrontation or seeking information), (b) task-focused avoidance (e.g., rapid subsequent task execution), (c) emotion-focused approach (e.g., covert rehearsal of an error), and (d) emotion-focused avoidance (e.g., planning the next task).

Examining structural validity of the SSCSS, an abbreviated version of the Coping Styles in Sport Survey (CSSS; Anshel et al., 2000), was the main purpose of the present study. This study further aimed to investigate the psychometric properties of the scale with specific reference to its concurrent, convergent, and discriminant validity, internal consistency, and test-retest reliability.

2. Method

2.1. Participants and Procedure

Participants were 452 Iranian athletes (288 males, 164 females), who were currently involved in organized competitive sports. The mean age of the total sample was 22.7 years ranging from 17 to 28 years (SD= 3.3 yrs.). They had participated in their major sport for an average of 7.7 years (SD= 3.7 yrs.). Identification of their highest level of competition in their major sport, ranked by percentage, included premier leagues (53%), national (29%), and international (18%). The participants competed at their highest level for an average of 3.5 years (SD= 2.4). Twenty-eight coaches were contacted officially and explained of the purposes and procedures of the research project. Twenty-five coaches authorized us to meet their athletes under their supervision at the end of a training session. During these meetings, athletes were asked if they would volunteer to participate in the study. They were briefed about the nature of the study and their responsibilities as participants. Athletes were then asked to complete the Sport Stress Coping Styles Scale (SSCSS), the COPE inventory (Carver et al., 1989), the Multidimensional Competitive Anxiety Questionnaire (MCAQ; Besharat, 2009), and the Mental Health Inventory (MHI; Veit & Ware, 1983) at the same time to assess concurrent, convergent, and discriminant validity of the instrument. One hundred and seven athletes (65 males, 42 females) completed the SSCSS twice, with a four to six-week interval between measurements.

2.2. Measures

**Sport Stress Coping Styles Scale (SSCSS)**- This is an abbreviated version of the Coping Styles in Sport Survey (CSSS; Anshel et al., 2000) that consisted of 34 items chosen on the basis of an initial factor analysis of the CSSS. This abbreviated measure included the 7-10 top-loading items from the four coping subscales originally developed by Anshel et al. (2000): Approach-Task (7 items), Approach-Emotion (10 items), Avoidance-Task (7 items), and Avoidance-Emotion (10 items). Participants respond to the items using a five-point Likert scale, from 1= strongly disagree to 5= strongly agree.

**Tehran Coping Styles Scale (TCSS)**- This is a Farsi version of the COPE (Carver et al., 1989), a theoretically based measure assessing 15 coping strategies that are applicable across numerous stressful settings. Adequate psychometric properties of English (e.g., Carver et al, 1989; Eubank & Collins, 2000) and Farsi (Besharat, 2007) versions of the scale have been reported.

**Multidimensional Competitive Anxiety Questionnaire (MCAQ)**- This is a 15-item questionnaire was developed to measure competitive anxiety in Iranian athletes (Besharat, 2009). Each item is rated on a five-point Likert scale anchored by 1= almost never to 5= almost always. The MCAQ consists of three subscales including
cognitive anxiety, somatic anxiety, and self-confidence. The MCAQ has received strong empirical support for its psychometric properties in Iranian populations (Besharat, 2009).

**Mental Health Inventory (MHI; Veit & Ware, 1983)**- This is a 38-item measure that provides two subscales of Psychological Well-Being and Psychological Distress. Participants are asked to report how often they feel a variety of affective states on a five-point Likert scale anchored by 1= strongly disagree to 5= strongly agree. Satisfactory psychometric properties of the MHI have been reported (Manne & Schnoll, 2001; Veit & Ware, 1983).

### 3. Results

#### 3.1. Confirmatory Factor Analysis

Using confirmatory factor analysis, the four-factor structure of the Sport Stress Coping Styles Scale (SSCSS) was tested for the entire sample. The parameter estimates for each of the items are presented in Table 1.

<table>
<thead>
<tr>
<th>Item</th>
<th>APT PE</th>
<th>Item</th>
<th>APE PE</th>
<th>Item</th>
<th>AVT PE</th>
<th>Item</th>
<th>AVE PE</th>
</tr>
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<tbody>
<tr>
<td>31</td>
<td>.74</td>
<td>16</td>
<td>.73</td>
<td>33</td>
<td>.74</td>
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<td>.77</td>
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<td>15</td>
<td>.70</td>
<td>32</td>
<td>.71</td>
<td>24</td>
<td>.72</td>
<td>19</td>
<td>.70</td>
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<td>27</td>
<td>.63</td>
<td>28</td>
<td>.66</td>
<td>29</td>
<td>.66</td>
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<td>.63</td>
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<tr>
<td>9</td>
<td>.57</td>
<td>3</td>
<td>.62</td>
<td>18</td>
<td>.60</td>
<td>26</td>
<td>.59</td>
</tr>
<tr>
<td>21</td>
<td>.52</td>
<td>17</td>
<td>.57</td>
<td>12</td>
<td>.56</td>
<td>14</td>
<td>.56</td>
</tr>
<tr>
<td>2</td>
<td>.44</td>
<td>10</td>
<td>.55</td>
<td>6</td>
<td>.47</td>
<td>13</td>
<td>.53</td>
</tr>
<tr>
<td>1</td>
<td>.41</td>
<td>4</td>
<td>.51</td>
<td>5</td>
<td>.40</td>
<td>8</td>
<td>.48</td>
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<tr>
<td>11</td>
<td>.44</td>
<td>30</td>
<td>.47</td>
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<td></td>
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<td>22</td>
<td>.42</td>
<td>34</td>
<td>.44</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>23</td>
<td>.40</td>
<td>7</td>
<td>.41</td>
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</tr>
</tbody>
</table>

APT= Approach-Task; APE= Approach-Emotion; AVT= Avoidance-Task; AVE= Avoidance-Emotion; PE= Parameter Estimates; All parameter estimates are significant at P<.05.

The four-factor structure of the SSSCSS was found to meet the criteria standards for adequacy of fit to the data: goodness-of-fit index= .91, adjusted goodness-of-fit index= .89, nonnormed fit index= .91, comparative fit index= .93, and root-mean-square error of approximation= .06. All parameter estimates met the criteria standards for adequacy of fit.

#### 3.2. Correlations between the SSSCSS, the TCSS, the MCAQ, and the MHI

To examine the relationship between the SSSCSS, the TCSS, the MCAQ, and the MHI, a series of zero-order correlations were conducted. Table 2 shows correlations of the SSSCSS with problem-focused coping, positive emotion-focused coping, negative emotion-focused coping, cognitive anxiety, somatic anxiety, self-confidence, psychological well-being, and psychological distress. These correlations support concurrent, convergent and discriminant validity of the SSSCSS. Internal reliability coefficients and mean inter-item correlations for the SSSCSS are also presented at the bottom of this table.
Table 2. Internal Reliability Coefficients, Mean Inter-Item Correlations, and Pearson correlations of the Sport Stress Coping Styles Scale with TCSS, MCAQ, and MHI scales

<table>
<thead>
<tr>
<th>Scales</th>
<th>APT</th>
<th>APE</th>
<th>AVT</th>
<th>AVE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TCSS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Problem-focused</td>
<td>.58</td>
<td>.49</td>
<td>.52</td>
<td>.45</td>
</tr>
<tr>
<td>Positive emotion-focused</td>
<td>.47</td>
<td>.55</td>
<td>.22</td>
<td>.19</td>
</tr>
<tr>
<td>Negative emotion-focused</td>
<td>-.42</td>
<td>-.48</td>
<td>-.33</td>
<td>-.40</td>
</tr>
<tr>
<td><strong>MCAQ</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive anxiety</td>
<td>-.25</td>
<td>-.28</td>
<td>-.36</td>
<td>-.43</td>
</tr>
<tr>
<td>Somatic anxiety</td>
<td>-.24</td>
<td>-.30</td>
<td>-.32</td>
<td>-.39</td>
</tr>
<tr>
<td>Self-confidence</td>
<td>.55</td>
<td>.52</td>
<td>.25</td>
<td>.21</td>
</tr>
<tr>
<td><strong>MHI</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Psychological well-being</td>
<td>.46</td>
<td>.44</td>
<td>.35</td>
<td>.27</td>
</tr>
<tr>
<td>Psychological distress</td>
<td>-.34</td>
<td>-.40</td>
<td>-.31</td>
<td>-.35</td>
</tr>
<tr>
<td>Internal Reliability Coefficient</td>
<td>.88</td>
<td>.83</td>
<td>.91</td>
<td>.94</td>
</tr>
<tr>
<td>Mean Inter-Item Correlation</td>
<td>.32</td>
<td>.28</td>
<td>.23</td>
<td>.21</td>
</tr>
</tbody>
</table>

TCSS= Tehran Coping Styles Scale; MCAQ= Multidimensional Competitive Anxiety Questionnaire; MHI= Mental Health Inventory; APT= Approach-Task; APE= Approach-Emotion; AVT= Avoidance-Task; AVE= Avoidance-Emotion; all p values <.001.

### 3.3. Reliability

In order to examine the internal consistency for the SSCSS, Cronbach’s alpha coefficients were calculated for the entire sample of 452 participants. The alpha coefficients for the Approach-Task, Approach-Emotion, Avoidance-Task, and Avoidance-Emotion were .88, .83, .91, and .94, respectively. These findings suggest that the SSCSS is internally consistent.

To examine the test-retest reliability of the SSCSS, 107 athletes (65 males, 42 females) completed the scale four to six weeks after initial testing. Intraclass correlation coefficients between the scale scores at time 1 and time 2 were calculated. The evidence of the temporal stability was .73 for Approach-Task, .76 for Approach-Emotion, .81 for Avoidance-Task, and .84 for Avoidance-Emotion.

### 4. Discussion

The overall results of the present study provided support for factorial validity of the SSCSS in a sample of Iranian athletes. The results of the confirmatory factor analysis provided support for the four factor coping model: Approach-Task, Approach-Emotion, Avoidance-Task, and Avoidance-Emotion. This is in line with the factorial structure found in the original English version of the Coping Styles in Sport Survey (Anshel et al., 2000). The examination of parameter item estimates revealed that all estimates were significant. Parameter item estimates revealed that all estimates were significant.

The concurrent, convergent, and discriminant validity of the SSCSS was demonstrated in the pattern of correlations between the SSCSS factors and measures of related constructs including problem-focused coping, positive emotion-focused coping, negative emotion-focused coping, cognitive anxiety, somatic anxiety, self-confidence, psychological well-being, and psychological distress. Findings confirmed the concurrent, convergent, and discriminant of the SSCSS. The pattern of correlations is consistent with the results from previous studies using
original English version of the Coping Styles in Sport Survey (Anshel et al., 2000). Moreover, these findings provided evidence for applicability of the SSCSS for Iranian athletes supporting and its cross-cultural validity.

The results indicated that the SSCSS has adequate internal consistency and test-retest reliability. The homogeneity of the factor scales was confirmed by the mean inter-item correlations, which tended to fall within the optimal range of .20 to .40 (Cole, 1987; Breckler, 1990). The results also revealed that test-retest reliability was satisfactory for the SSCSS subscales.

The SSCSS demonstrated a replicable four-factor structure that was congruent with the theoretical construct of coping responses. Future research in the field of coping in sport can benefit from the SSCSS. The scale can help in understanding mechanisms in coping with sport stresses. Iranian findings on sport-related copings can also contribute to our knowledge of cultural influences on the construct. These findings, however, are limited in terms of the stability of the factorial structure. Although this study provides evidence about the psychometric integrity of the SSCSS, the task of establishing the reliability and validity foundations of the instrument is an ongoing process.

Acknowledgements

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References


