A STUDY ON THE RELATIONSHIP OF TRAIT AND STATE ANXIETY ON THE PERFORMANCE OF ARCHERS

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Abstract:

The main objective of the study to analysis the effect of anxiety on performance of archers and specially the study was aimed at exploring the relationship of both trait and state anxiety. 80 subjects were taken, 34 female (42.5%) and 46 male (57.5%) and questionnaire were filled by researcher after subjects give consent for same. Competitive State Anxiety Inventory 2 (CSAI-2) and State Trait Anxiety Scale were used to assess the state and trait anxiety respectively. To performance FITA round score of archers was used. Result of the study observed a significant negative correlation of trait anxiety and somatic component of CSAI-2 with the performance of archers($p<0.01$). Among each other these parameter show positive relation indications. On the other side the increase the age improves the overall scoring and confidence component of the state competitive anxiety scale also shows significant positive correlation with the performance of the players.

Keywords: archers, trait anxiety, state anxiety, performance

1. Introduction

In sports psychology, anxiety is vital component which influences performance. "*Anxiety is by definition a negative feeling state*" (Jones & Hanton, 2001). Anxiety occurs as a result of threat and this threat is "*related to the subjective evaluation of a situation, and concerns jeopardy to one's self-esteem during performance or social situations, physical danger, or insecurity and uncertainty*" (Schwenkmezger & Steffgen, 1989). Anxiety is further

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described as state anxiety which can be considered to be more situational in nature and is often associated with arousal of the autonomic nervous system, and trait anxiety which can be thought of as a world view that an individual uses when coping with situations in his or her environment (Spielberger, 1966).

Within the context of sports, anxiety influences the performance. Those individuals who are having low trait anxious and experience high state anxiety would find the anxiety as facilitative to a peak performance; but, those individuals with who are having high trait anxious and experience state anxiety will find it debilitative to athletic performance (Hardy et al., 1996). According to the inverted-U hypothesis model, the relationship between the arousal and performance that as arousal increased performance would increase as well; but, if arousal became too great performance would deteriorate. (Broadhurst, 1957; Hebb, 1955). A theory proposed by Martens, Vealey, and Burton (1990) of competitive anxiety in which perceived threat of a competitive situation act as function in competitive state anxiety. That perceived threat arises because of the uncertainty of the established goal and the importance placed on the performance outcome of the competitive situation. Therefore, an increase in competitive state anxiety in either due to uncertainty or importance of the performance outcome of a competitive event which would lead to an increase in perceived threat. The immensity of the increase in state anxiety was also assumed to depend on the individuals' trait anxiety. As trait anxiety is construct reflected in most models of personality and refers to a relatively stable disposition within the individual to judge a wide range of environmental events as potentially threatening. (Performance psychology, 2011).

The few anxiety studies among archers and other sports such as gymnast, swimming, tennis, basketball and field hockey demonstrated that level of anxiety is higher which debilitative the subject performance than those who reported it as being facilitative (Jones, Hanton, & Swain, 1994, Griffin roland, 1971, Swain & Jones, 1996, Jones, Swain, & Hardy, 1993). Griffin Roland, 1971 found that individual sports events show higher state anxiety and trait anxiety compared with the volleyball, field hockey, softball and basketball. On focusing on the Archery is individual game, researchers supported that subjects competing in individual sports report significantly lower self-confidence and higher somatic anxiety than team sport athletes (Kirby & Liu, 1999, Martin and Hall's (1997)). In sporting environment archery is a cognitive game (Ruis & Stevenson, 2004). Although archery is less physical demanding but it requires strong psychological aspects of obtain optimal performance. The psychological aspects are Concentration, motivation, ability to cope with various forms of anxiety and arousal. Archery is game of mind requires highly mental concentration to focus on the aim while shooting (Siwach & Jaipal, 2013). In shooting the visual and selection attention is necessary which gets affected due to anxiety, external noises and tension and this will adversely affect the performance (Lee, 2009). Furthermore in shooting anxiety also disrupting goal-directed attention, leading to a significant impairment in performance

effectiveness (Causer J., 2011). Thus the primary purpose of the study investigate the state and trait anxiety relation with the performance in archery population.

An additional aspect of our study is influence of age on the performance as in archery the precise shooting skills are required which draw minimal amount of disturbances while shooting. In comparison of the elite and novice players the heart rate is lesser in elite, activation of the extensor muscle more among the elite, less activation of flexor muscle digitorum while aiming and releasing and less postural sway. These all skills provide the stable position to focus on the aim in elite athlete to achieve maximum and consistent scoring whereas in novice athletes these factor fluctuate the aiming and releasing of the arrow (Musa et al., 2018). Other than the physical factors the mental abilities also contribute such as more confident, using goal setting and being more concentrated skills are identified by the experience athletes in themselves (Goudas et al., 1998; Bebetsos & Antoniou, 2003).

As anxiety leads to self conscious which narrow the attention process and embark inward focus. (Baumeister, 1984; Masters, 1992). This inward focus disturbs the normal, automatic processing of the task and decline the performance. (Baumeister, 1984; Beilock & Carr, 2001; Lewis & Linder, 1997). There is dearth in the literature in relation of trait and state anxiety in archery, in soccer it explained very well. Thus the study is designed with the aim to find out the interrelation of state and trait anxiety effect on the performance of the archers.

2. Methodology

2.1 Participants
This cross sectional study has been carried out on total number of 80 archers, of both sexes 34 female (42.5%) and 46male (57.5%), aged between 16 to 25, who participated in the interuniversity and intercollege archery tournament in Guru Nanak Dev University, Amritsar and Punjabi University, Patiala were recruited in the study. The study was approved by the ethical committee of Guru Nanak Dev University. Participating players did not receive any kind of compensation for their participation.

2.2 Material and Procedure
Prior to the data collection instrumentation, all the volunteer participants filled the written informed consent. Participants were informed that they would be completing two surveys to assess the trait and state anxiety but they having freedom to quit the survey at anytime. In the first survey The state trait anxiety scale was administered to the participants before one month of the competition to analysis the trait anxiety. The second survey was to assess the state anxiety by using competitive state inventory scale 1 hour prior to the competition.

2.3 Measures

State trait anxiety inventory: this scale was used to assess the trait anxiety developed by Spielberger. A self evaluation questionnaire type state trait inventory scale which consist of 40 questions, questions are like I feel secure, calm. Participants rated each question on a scale from not at all (1) to very much so(4) grading.

Competitive state anxiety inventory scale-2: it is a Linkert type scale, having 27 questions, these are asses situation specific state anxiety. The subtypes of anxiety that are cognitive, somatic and confidence were also measured through it. Scoring of the scale is from 9 to 36 which depict high and low level of each types of anxiety component.

Performance assessment: according to the FITA (World Archery, also and formerly known as FITA from the French Fédération Internationale de Tir à l'Arc), archery scoring from the highest scoring to the lowest one. Arrow should be shooted from a particular final line to standard faces which is of 122cm in diameter and composed of a circle in the center of 24.4cm diameter ringed by four concentric bands, the breadth of each measured radially being 12.2cm. Distance from the shooting line to standard faces is 70m, for both men and women. The colors of target faces are gold, red, and blue, black and white. The most inner centre area is taking 10+ scoring and the scoring follow from 10 to 9,8,7, 6 as the shooting arrow falls outward toward the gold, red colour zones.

3. Result

The data of 80 players was statistically analysed using statistical package for social sciences (SPSS)/ 17.0. Statistical test used in the present study was Pearson's correlation. The significance level was set as 0.05 and 0.01 levels. Scales used for data collection state trait anxiety scale, cognitive and somatic state anxiety scale and state self-confidence were all reliable (Cronbach's alpha= 0.89, 0.81, 0.81 and 0.88 respectively). The analysis with the Pearson correlation method shows the correlation of the trait and state anxiety with the performance of the players. Descriptive stats show mean and standard deviation of age, STAS, CSAI-cognitive, somatic and self-confidence shown in Table 1. The result indicated that age and confidence of the competitive state anxiety inventory 2 scale (CSAI) shows significant positive correlation with the performance of the archers at the p value less than 0.05 and 0.01 respectively. Significant negative correlation with the performance of the archers were shown by the state trait anxiety scale, somatic component of competitive state anxiety inventory 2 scale. The age shows significance positive correlation with the archers performance at (p<0.05) level whereas the state trait anxiety scale, somatic component and confidence show highly significant negative and positive correlation with the performance results at the p value 0.01 level respectively. The result depicted that increase in the trait anxiety and somatic component decrease the performance of the player. On the other side age and

confidence enhance the performance. Table 2 and figure 1 show correlation of the both state and trait anxiety with the performance.

Table 1: Scoring of state trait anxiety scale and subtypes of
the state competitive anxiety inventory-2 scale

Descriptive Statistics	Mean	SD	N
Age	19.66	1.98	80
State-Trait Anxiety Scale	85.53	15.29	80
CSAI-Cognitive	19.53	5.23	80
CSAI-Somatic	17.11	4.89	80
CSAI-Confidence	26.26	4.10	80
Scoring	578.23	124.19	80

Table 1 represents the no of players(N), mean scores and standard deviation (SD) of the age, of state trait anxiety scale and the cognitive, somatic and self-confidence types of the competitive state anxiety inventory 2 scale(CSAI).

Table 2: Correlation of state trait anxiety scale and
competitive state anxiety scale with scoring

Correlation Matrix	Correlation of GAME Scores			
	Pearson Correlation	P Value	N	Result
Age	.229*	0.041	80	Significant
State-Trait Anxiety Scale	-.311**	0.005	80	Significant
CSAI-Cognitive	-0.009	0.936	80	Not Significant
CSAI-Somatic	-.409**	0.000	80	Significant
CSAI-Confidence	.394**	0.000	80	Significant
*. Correlation is significant at the 0.05 level (2-tailed).				
**. Correlation is significant at the 0.01 level (2-tailed).				

Table 2 show the p value and Pearson correlation values of the correlation of the age, State trait anxiety scale, cognitive, somatic and self-confidence component of competitive state anxiety inventory-2 scale.
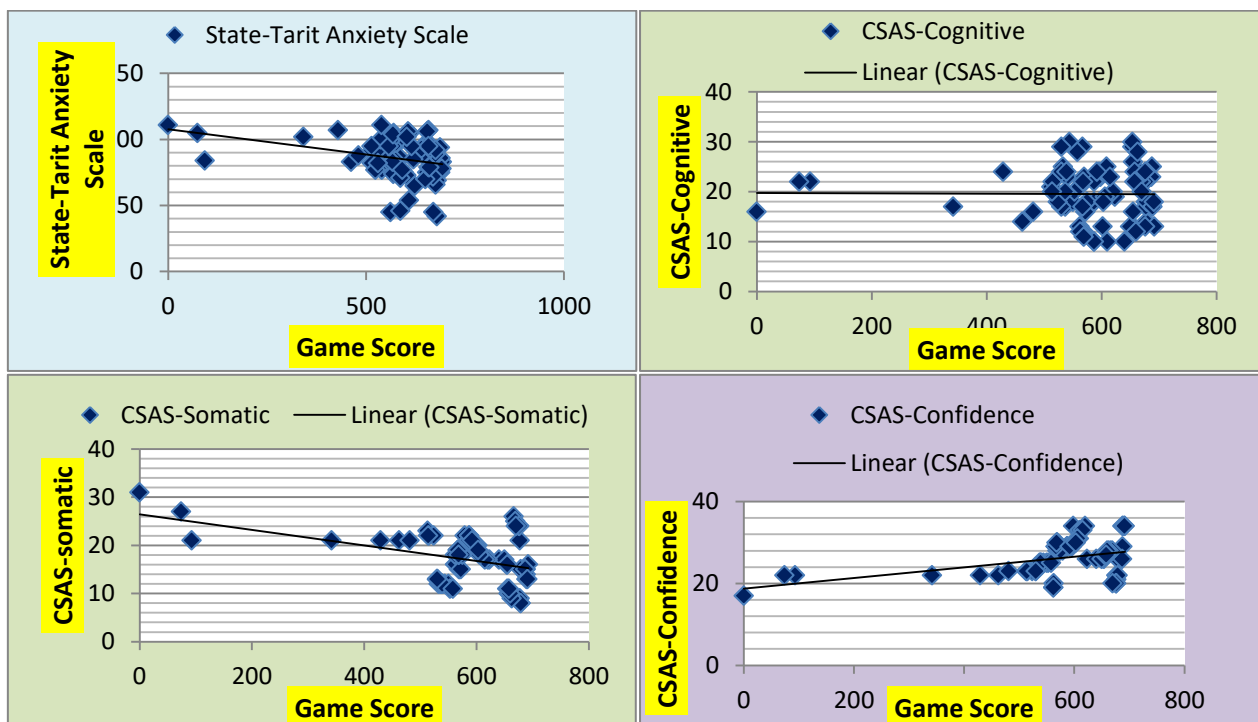
Figure 1: Correlation of the scoring of the state trait anxiety scale subtypes of the
CSAI-2 scale cognitive, somatic and self-confidence with the performance of the archers

This figure shows the negative correlation of state trait anxiety scale and somatic component of CSAI-2 with the performance. With the increase in state trait anxiety and somatic scoring, the performance of the players gets declined. On the other positive correlation represent by the confidence with the performance of the archers whereas cognitive type is neutral with the performance.

4. Discussion

The primary aim of the study was to investigate the effect of state and trait anxiety on the performance of the archers. The analysis of the result reported the positive correlation of the age with performance of the players. There was significant improvement in the performance of the players with their increasing age as various factors such as physical, psychological factors and technical skills of shooting gets better with the experiences and repetitive practice. Robazza & Bortoli, 1998 found that the mental factors such as confidence, concentration, positive expectations get improved with the experience. Along with the mental factors, good levels of technical skills in the archers were also necessary to enhance the performance. The skills were to control the postural sway which reduce bow movement while shooting, activation of extensor muscle to focusing on the aim by relaxing flexor muscle compartment. These virtuosities were better in the experience players than the novice and non-medalist players (Musa et al., 2018). As the experience of the players gets increases, psychological and physical skills also get improved. Longo et al, performed an Olympic level study

and postulated that in the archery the mean age of the peak performance among male population is 25.3 to 26.7 and 23.8 to 25.3 for female population.

The trait anxiety effect on the performance of the archers was analyzed. The results showed negative correlation of the trait anxiety with the performance of the players. It indicated that if the trait anxiety which perceive many situations as menace is found increased in the players, it will adversely affect the performance of the players. Trait anxiety is a personality characteristics which relatively remain same and stable, it get precipitate under the influence of state anxiety in response to certain situations (Cox, 2007). In context of sports, it can be attributed that anxiety may decline the concentration, focus and create hindrance in the performance of the players which may leads to negative feeling of fear, apprehension and self doubts among players. Khan et.al, 2017 have been found as supportive evidence for the effect of anxiety on sports performance and postulated that catecholamine production gets increased in anxiety and stress state which leads to decrease in concentration, feelings of fear, and players find difficulty in decision making. It also influences various other systems of the body.

Martens et al, 1990, explain anxiety is a multidimensional theory and develop the competitive state anxiety inventory-2 scale which assesses the cognitive, somatic and self confidence component of the state anxiety. Cognitive component is negative expectation and worries about the performance, somatic component show the physiological effects. In current study result represents that the somatic component and confidence component of the competitive state anxiety scale shows negative and positive correlation with the performance respectively. Somatic component include physiological symptoms of increase heart rate, palm sweating, shortness of breath, tense muscles and shakiness. These symptoms alter the aim and focus of the shooter which cause detrimental effect on the performance of the players. Temporal sequence of cognitive and somatic component was investigated by Jones, 1995 and found that somatic component rapidly increases as the start of event becomes closer whereas the cognitive component remains stable. According to Hardy et.al, 1996 if physiological arousal levels are too high then there is a steep decline in performance which can only be reversed by a reduction in physiological arousal. Researcher (Kumar, 2013) reported that the increase the level of competitive anxiety will decrease the performance among the archers. Another supportive study by Parnabas, 2015 on the anxiety in hockey population and showed the negative correlation of state competitive anxiety with the performance of players. The overall performance decline with elevating the level of both trait and state anxiety as they are in positive correlation with each other.

6. Conclusions

The study conclude that trait anxiety and somatic state anxiety show negative significant correlation with performance whereas self confidence and age show significant positive correlation with the performance.

6.1 Significance and Future directions

The finding of the study can be used in several ways: it will help the coaches, trainer and psychological counselor to modify the practice session and used of coping strategies to deal with the individual with high level of trait anxiety and at pre competitive state. The individual's ability to increase efficiency in competition level can be improved by repetitive exposure to game that leads to reduced anxiety level and also help the players to cope up with the intensive competition. The other coping strategies involve psychological counseling and mental relaxation techniques will increment the performance and contribute to upliftment of particular game at nation level.

6.2 Future Suggestions

The study can conducted on the large population scale. To assess the trait anxiety and personality domains longitudinal studies can be designed.

6.3 Limitation of the Study

Small sample size.

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