INTENSITY AND DIRECTION OF COMPETITIVE STATE ANXIETY, SELF-CONFIDENCE AND ATHLETIC PERFORMANCE

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Abstract:

The aim of this study was to examine the relationship between the intensity and direction of competitive state anxiety, self-confidence and performance in basketball and volleyball players prior to different matches. Male basketball (n=12) and volleyball players (n=12) completed a modified version of the Competitive State Anxiety Inventory-2 (CSAI-2) prior to 11 different matches, and a total of 132 questionnaires overall. The inventory included an intensity subscale as well as direction sub-scale for somatic and cognitive anxiety. The findings revealed a moderate level of state anxiety and very high self-confidence of the players before the matches. The cognitive and somatic anxiety and self-confidence were stable prior to the different matches. Correlation analysis showed that the intensity and direction of somatic and cognitive anxiety and self-confidence of the players were not related to their athletic performance. However, the intensity of cognitive anxiety was positively and moderately related to their athletic performance.

Key words: state anxiety, direction scale, performance, volleyball, basketball

INTENSITÄT UND EINFLUSSTYP DER WETTKAMPFBEZOGENEN AUFREGUNG, DES SELBSTBEWUSSTSEINS UND DER SPORTLICHEN LEISTUNG

Zusammenfassung:

Die vorliegende Forschung hat zum Ziel, sowohl die Intensität und den Typ der Aufregung und des Selbstbewusstseins vor den Wettkämpfen zu betrachten, als auch deren Auswirkung auf die Wettkampfsresultate im Basketball und Volleyball. Ein Basketball- (n = 12) und ein Volleyballteam (n = 12) haben vor 11 unterschiedlichen Wettkämpfen eine modifizierte Umfrage zum Thema *Aufregung vor den Wettkämpfen* ausgefüllt. Insgesamt wurden 132 Fragebogen ausgefüllt. Die Umfrage hatte eine Unterskala zur Einschätzung sowohl der kognitiven und somatischen Intensität als auch des Aufregungstyps. Die Forschungsergebnisse haben sowohl eine mäßige Aufregung des Zustandes als auch sehr hohes Selbstbewußtsein vor den Wettkämpfen war stabil. Die Korrelationsanalyse zeigte, dass die Intensität und die Auswirkung der Aufregung in keinem wechselseitigen Zusammenhang mit der sportlichen Leistung waren. Die Intensität der Aufregung korrelierte positiv und mäßig mit sportlicher Leistung.

Schlüsselwörter: Aufregung, Auswirkung, Leistung, Volleyball, Basketball

Introduction

Nearly every concern of human endeavor is thought to be affected somehow by anxiety (Levitt, 1967). Anxiety is a reaction by an individual to a stressful situation (Spielberger, 1972), and in competitive sports, a great amount of stress can be placed on an athlete's performance. Anxiety, particularly precompetition anxiety, has been an important focus of research in sport and performance psychology (e.g. Jones & Hardy, 1990; Martens, Burton, Vealey, Bump, & Smith, 1990; Vealey, 1990). Research in clinical and test anxiety literature has separated the state anxiety into cognitive and somatic components (Liebert & Morris, 1967; Borkovec, 1976; Davidson & Schwartz, 1976). Cognitive anxiety refers to negative expectations and cognitive concern about performance, the consequences of failure, negative self-evaluation, evaluation of one's ability relative to others, the inability to concentrate, and disrupted attention. Somatic anxiety refers to one's perception of the affective physiological elements of anxiety, generated from an increase of autonomic arousal and unpleasant feelings such as nervousness, tension and upset. The current multidimensional approach to competitive state anxiety has emerged through the work of Martens and associates (1990) and their development of the Competitive State Anxiety Inventory-2 (CSAI-2) which measures cognitive anxiety, somatic anxiety, and selfconfidence. Although some research studies have provided support for multidimensional anxiety predictions (Gould, Petlichkoff, & Weinberg, 1984; Martens et al., 1990), other research findings have been contrary to the predictions (Caruso, Dzewaltowski, Gill, & McElroy, 1990; Parfitt, Jones, & Hardy, 1990).

Jones (1991) argued that the CSAI-2 measures only the intensity of anxiety symptoms and that high scores may not necessarily have negative connotations. He proposed that the inventory should also assess the direction of anxiety responses, i.e., the extent to which the symptoms experienced are perceived as either facilitative or debilitative to performance. An initial study in sport psychology to give empirical support to the notion that anxiety can have facilitative or debilitative effects on performance was conducted by Jones and Swain (1992). The results showed that the overall directional mean scores in all three CSAI-2 subscales were positive, indicating that the subjects interpreted their anxiety symptoms as facilitative to performance. Recent studies (e.g., Jones, Swain, & Hardy, 1993; Jones & Swain, 1995; Lane, Terry, & Karagerorghis, 1995; Wiggins, 1998) have also found anxiety more facilitative to performance. Studies have revealed a consistent pattern of findings in their comparisons between elite and non-elite performers in both the state and trait responses (Jones, Hanton, & Swain, 1994; Jones & Swain, 1992), good and poor performers (Jones, Swain, & Hardy, 1993), high and low competitive individuals (Jones & Swain, 1992) and positive and negative goal experience groups (Jones & Hanton, 1996). Although no significant differences were found in the intensity of symptoms between the groups, the elite performers, good performers, highly competitive individuals and members of the positive goal expectancy group reported significantly more facilitative interpretations of symptoms associated with competitive anxiety than their comparison groups (Craft, Magyar, Becker, & Feltz. 2003).

Jones and associates (Jones, Hanton, & Swain, 1994; Jones & Swain, 1992; Jones, Swain, & Hardy, 1993) have conducted a series of investigations to explore the potential influence of directional perceptions of anxiety on the anxiety-performance relationship. In team sports the performance is usually measured by win/loss. Gould and colleagues (Gould & Krane, 1992; Gould, Petlichkoff, Simons,

& Vevera, 1987) observed that a number of studies have compared absolute performance outcome scores that are rather global, without taking into account, for example, the player's positions or the performances of the teammates. Such measures may well confound the sensitive relationship that exists between anxiety and performance due to the lack of precision with which performance has been assessed. In order to avoid the problem different methods have been used. Edwards and Hardy (1996) asked netball players to evaluate subjectively their own performance on a 10-point Likert-type scale. The players' self-evaluation of their performance is strongly influenced by the emotions of the game, especially the result of the game. According to this it is more objective to get an evaluation from an expert who knows the absolute limits of the players. The coaches of the team certainly have an overview from the training process and players' condition.

Any change in the perceived symptoms of anxiety preceding a competitive event, operationally defined as temporal patterns, may have a significant impact on performance. Wiggins (1998) studied the temporal patterns of anxiety on college athletes competing in soccer, swimming and track--and-field. Anxiety was measured 24 hours, 2 hours and 1 hour before the competition. As in previous studies investigating anxiety intensity (e.g., Gould et al., 1984; Martens, 1990), perceived levels of cognitive anxiety remained relatively stable before the competition, whereas somatic anxiety levels increased significantly from 24 hours to 1 hour. All the measurements were taken before a single competition. In team sports it is extremely important to perform in a stable way throughout the season and evaluate the anxiety prior to different matches.

The purpose of the present study was to extend the research that has examined the relationship between competitive state anxiety, self-confidence and athletic performance identifying levels for intensity and direction of anxiety and self-confidence among athletes prior to different matches. This study represents an examination of Jones' directionality hypothesis (1991, 1995) within the context of the Multidimensional Anxiety Theory (Martens et al., 1990).

Methods

Participants

The participants of this study were two professional male teams competing in the highest national league. Players of the male basketball team (n=12) and male volleyball team (n=12) were studied prior to 11 different matches, and through a total of 132 questionnaires overall.

Procedures

All measures were completed during the competition season 2003. The purpose of the investigation was explained to the players and the coaches of the teams. The athletes completed the questionnaire just prior to the warm-up phase, approximately 1 hour before the competition. The participants were provided with instructions for the completion of the test, including the antisocial desirability instructions, as recommended by Martens and associates (1990), and a guarantee of confidentiality in writing. The participants were asked to respond to the test according to how they feel at present. The basketball players filled the questionnaire prior to 5 and the volleyball players prior to 6 different national league matches.

Measures

Intensity of anxiety. The Competitive State Anxiety Inventory-2 (CSAI-2) (Martens et al., 1990) was used to estimate the participants' cognitive and somatic anxiety as well as self--confidence. Cronbach's alpha coefficients of internal consistency, for reliability averaged over the 11 measures, were .90 for cognitive, and .92 for somatic anxiety and self-confidence, which was similar to those noted by Martens and his colleagues (1990). The CSAI-2 consists of 27 items, 9 for each subscale (cognitive anxiety, somatic anxiety and self-confidence). Each item was rated on a 4-point Likert-type scale, producing a score ranging from a low 9 to a high 36 for each subscale. All items were positively stated except the item 14 which was stated negatively and was, thus, scored reversely in the analyses.

Direction of anxiety. The participants also completed a facilitative/debilitative scale (Jones & Swain, 1992; Jones, Swain, & Hardy, 1993), which assessed the direction of somatic and cognitive anxiety. In the direction scale each subject rated the degree to which the experienced intensity of each symptom was either facilitative or debilitative to his/her performance on a scale from -3 ("very debilitative") to +3 ("very facilitative"). Thus, the possible direction scores on each subscale ranged from -27 to +27. Cronbach's alpha coefficients for

internal reliability, averaged over the 11 measures, were .87 for both the cognitive and somatic anxieties. The numbers are similar to those reported by Jones and Hanton (1996).

Subjective performance evaluation. Coaches of the teams (the head and the assistance coach) were asked to evaluate the players performance on a 10-point Likert-type scale from 1 ("played much worse than usual") to 10 ("played much better than usual"). Both coaches evaluated the players individually; afterwards, the mean score was calculated.

Results

Descriptive statistics (Table 1) revealed that both groups had high self-confidence and low anxiety intensity, with the volleyball players having a higher score of self-confidence (M=27.82, SD=3.54) than the basketball players. Both directional subscales had also overall positive mean scores and the somatic anxiety was rated more facilitative to performance (M=3.97, SD=6.01) than the cognitive anxiety (M=1.05, SD=6.75). The Student's *t*-test was used to compare the two groups. The differences between the volleyball and basketball players were revealed in the somatic anxiety direction (p < .05). Table 2 showed a moderate significant correlation (.50, p < .05) between the cognitive and somatic anxiety intensity. Correlations between the cognitive anxiety intensity and self-confidence intensity (-.52, p < .05), cognitive anxiety intensity and direction (-.48, p < .05), somatic anxiety intensity and self-confidence intensity (-.50, p < .05), somatic anxiety intensity and cognitive anxiety direction (-.37, p < .05), as well as the somatic anxiety intensity and direction (-.33, p < .05) were negative. Self-confidence intensity had a significant positive correlation with both the directional subscales (.60, .55, p < .05), the cognitive anxiety direction had a significant positive correlation with the somatic anxiety direction (.59, p < .05). Athletic performance had a positive significant correlation with the intensity of cognitive anxiety (.29, p < .05), while no significant correlation was revealed either between the performance and the somatic anxiety and self-confidence intensity (-.15, .00, p < .05.)or the performance and the cognitive and somatic anxiety direction (.06, .05, p <.05). No significant correlation was also revealed between the cognitive anxiety intensity and somatic anxiety direction (.06, p <.05).

Figures 1, 2 and 3 show the scores for the somatic and cognitive anxiety and self-confidence throughout 6 games in basketball and volleyball. The mean scores for the somatic and

Table 1. Means (\pm SD) of the modified CSA1-2 for the volleyball and basketball players

	Overall	Volleyball	Basketball
Cognitive anxiety intensity	13.83±3.20	14.84±3.13	12.93±3.01
Somatic anxiety intensity	12.33±2.80	12.00±2.15	12.63±3.27
Self-confidence intensity	26.38±4.09	27.82±3.54	25.01±4.15
Cognitive anxiety direction	1.05±6.75	1.30±6.91	0.82±6.66
Somatic anxiety direction	3.97±6.01	6.40±5.58	1.80±5.58*
Performance	5.38±1.75	4.78±1.72	5.93±1.61
*p<.05			

	C.A.I.	S.A.I.	S-C.I.	C.A.D.	S.A.D.	Performance
Cognitive anxiety intensity	-	.50*	52*	48*	06	.29*
Somatic anxiety intensity		-	50*	37*	33*	15
Self-confidence intensity			-	.60*	.55*	.00
Cognitive anxiety direction				-	.59*	.06
Somatic anxiety direction					-	.05
Performance						-

Table 2. Intercorrelations of CSAI-2 intensity and direction scores and performance

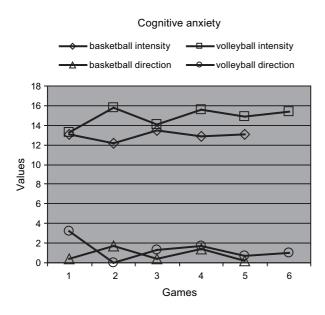
*p<.05

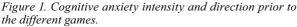
cognitive anxiety intensity and direction and the self-confidence intensity were moderately stable prior to different matches.

Discussion and conclusions

The aim of the present study was to extend the research that has examined the relationship between competitive state anxiety, self-confidence and athletic performance. Our study represents an examination of Jones' directionality hypothesis (1991, 1995) within the context of the Multidimensional Anxiety Theory (Martens et al., 1990). The results indicated that, generally, the intensity and direction of somatic and cognitive anxiety and self-confidence of the players were not related to the athletic performance. However, the intensity of cognitive anxiety was positively and moderately related to the athletic performance.

Anxiety levels for intensity and direction as well as self-confidence of the players prior to different matches were identified in the present study. The cognitive and somatic anxiety and self-confidence were relatively stable prior to different matches. Wiggins (1998) studied the temporal pat-





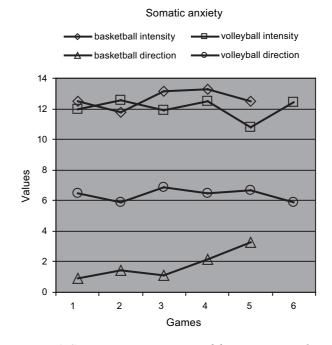


Figure 2. Somatic anxiety intensity and direction prior to the different games.

Self-confidence

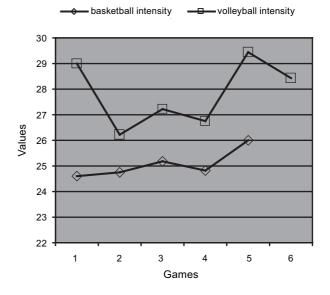


Figure 3. Self-confidence intensity prior to the different games.

terns of the anxiety and self-confidence 24 hours, 2 hours and 1 hour prior to a competition. While self-confidence and cognitive anxiety intensity remained stable before the competition, the somatic anxiety increased significantly from 24 hours to 1 hour. These findings indicated that once an athlete appraises the anxiety symptoms as facilitative or debilitative, and assesses a level of expectation for his/her performance, those evaluations remain consistent in the final 24 hours prior to the competition (Wiggins, 1998). The findings of the present study extend the understanding of an athlete's anxiety and self-confidence. According to the results it seems that professional athletes have a stable level of anxiety prior to different competitions. On the other hand, it is necessary to extend the research by comparing the anxiety levels of the elite and non-elite athletes prior to different competitions. It is also advisable to extend the study by measuring the time-specific patterns of anxiety development prior to a single competition and throughout the season in order to get a better insight into the state anxiety of athletes.

The intercorrelations among the subscales of the modified CSAI-2 provided some interesting findings. The relationship between the intensity and direction scores within each of the CSAI-2 subscales revealed a negative significant correlation between the intensity and the direction of cognitive and somatic anxiety. These results showed that higher levels of anxiety were associated with less favorable perceptions in terms of the consequences on performance. The negative correlations found between self-confidence and intensity subscales of the somatic and cognitive anxiety supported previous research conducted by Jones and associates (1993). Furthermore, as we had expected, the self--confidence of the players was positively related to the directional perceptions of somatic and cognitive anxiety.

The relationships between precompetition anxiety and self-confidence with athletic performance were weak, with only a positive correlation between the intensity of cognitive anxiety and performance. Several previous research findings support our results (Craft et al., 2003). The hypothesized relationships between anxiety and performance were not supported in wrestling (Gould, Petlichkoff, & Weinberg, 1984), gymnastics and golf (Krane & Williams, 1987), triathlon (Lane, Terry, & Karagerorghis, 1995) and rugby (Maynard & Howe, 1987). Using the directional scale Edwards and Hardy (1995) found that the directional perceptions of anxiety did not predict netball performance, while Lane and associates' (1995) findings showed that intensity and directional perceptions of anxiety did not predict athletic performance in triathlon. In contrast, Raudsepp and Kais (2002) found that directional perceptions, and not the intensity of pre-competitive anxiety, has a positive relationship with the objective measures of athletic performance in beach volleyball. Using an ideographic design, Burton (1988) showed the hypothesized relationships between anxiety responses and swimming performances. Hammermeister and Burton (1995) demonstrated that intensity scores on cognitive anxiety correlated negatively with triathlon performance, using a subjective performance criterion. Research with the directional scale of CSAI-2 has demonstrated that the interpretation of anxiety as facilitative was associated with a successful performance in basketball (Swain & Jones, 1996), badminton (Eubank, Smith, & Smethurst, 1995) and gymnastics (Jones, Swain, & Hardy, 1993).

The present study was conducted with several limitations. Most importantly, the athletes' performance was assessed by the coaches' subjective evaluations. In basketball the potentially good performance measurement instrument, developed by Sonstroem and Bernardo (1982), includes shot percentage, total points, rebounds, assists, steals, personal fouls and turnovers. In volleyball a similar system has been used by Raudsepp and Kais (2002). It includes technical elements such as serve, attack, blocking, reception, setting, and defense. In this way any subjectivity will be removed from the performance measurements. On the other hand, in order to get the most comprehensive overview of an athletic performance, it might be worth to appraise the technical records together with an expert evaluation in future research studies. The limitation of the present study is also the use of a one-time assessment of precompetition anxiety, which did not enable an analysis of the time-specific development pattern of anxiety and its effects on performance. Accordingly, the importance of collecting information on how anxiety changes during the course of a competition (preparation, execution, and the evaluation stages of a competition) appears fundamental to improving the predictive value of theories that seek to explain how such anxiety may influence athletic performance (Smith, Bellamy, Collins, & Newell, 2001).

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JAČINA I USMJERENOST STANJA KOMPETITIVNE ANKSIOZNOSTI, SAMOPOUZDANJA I SPORTSKE USPJEŠNOSTI

Sažetak

Uvod

Istraživanja su pokazala da je sposobnost suočavanja s naglašenom anksioznošću usko povezana s uspjehom u natjecateljskom, osobito vrhunskom sportu. Sukladno tome, brojna su istraživanja proučavala anksioznost u sportu, većinom Upitnikom stanja kompetitivne anksioznosti-2 (Competitive State Anxiety Inventory-2; CSAI-2, Martens i sur., 1990). S obzirom na određena ograničenja koja se javljaju u mjerenju intenziteta anksioznosti, Jones (1991) uvodi pojam 'usmjerene percepcije'. Istraživanja tom skalom usmjerenosti pokazuju da je interpretacija anksioznosti kao olakšavajućeg faktora povezana s uspješnošću. Tako je cilj ovog rada bio ispitati odnos između jačine i usmjerenosti kompetitivnoga stanja anksioznosti, samopouzdanja i sportske uspješnosti kod košarkaša i odbojkaša prije više različitih utakmica.

Metoda

Košarkaši (n=12) i odbojkaši (n=12) popunili su modificiranu verzij upitnika CSAI-2 prije 11 različitih utakmica, što je na koncu rezultiralo sa 132 popunjena upitnika za svaki sport. Upitnik je uključivao i subskalu jačine, kao i subskalu usmjerenosti na somatske i kognitivne simptome anksioznosti. Treneri su također vrednovali natjecateljsku uspješnost svojih igrača na svim utakmicama koristeći se skalom Likertova tipa sa 10 jedinica.

Rezultati

Dobiveni rezultati ukazuju na umjereno stanje anksioznosti i vrlo visoko samopouzdanje sportaša prije utakmica. Kognitivna i somatska anksioznost, kao i samopouzdanje pokazali su se stabilnima prije utakmica. Korelacijska analiza pokazuje da intenzitet i usmjerenost somatske i kognitivne anksioznosti i samopouzdanja igrača nije bilo povezano sa sportskom uspješnošću. Ipak, jačina kognitivne anksioznosti umjereno je i pozitivno povezana s uspješnošću.

Rasprava i zaključak

Naše istraživanje provjerava Jonesovu (1991) direktivnu hipotezu unutar multidimenzionalne teorije anksioznosti (Martens i sur., 1990). Rezultati pokazuju da, općenito, jačina i usmjerenost somatske i kognitivne anksioznosti sportaša, kao ni njihovo samopouzdanje nisu povezani sa sportskom uspješnošću. Ipak, dobivena je umjereno visoka i pozitivna povezanost jačine kognitivne anksioznosti i sportske uspješnosti.

U ovom je istraživanju sportska uspješnost operacionalizirana kao subjektivna trenerova procjena. U budućim istraživanjima trebalo bi koristiti valjaniji instrument za procjenu sportske izvedbe. Osim toga, bilo bi potrebno razmotriti i djelovanje obrazaca anksioznosti na sportsku uspješnost kroz vrijeme.