Chapter II

REVIEW OF RELATED LITERATURE

The research scholar gone through the various related literature available at the library of Lakshmibai National Institute of Physical Education, Gwalior as well as on internet and finally the abstract of the following research articles have been presented in this chapter.

Constantine and Gill¹ examined the relationship of cognitive worry. Somatic anxiety and self-confidence all components of the CSAI-2 (con. S.A.I.-2) to each other, to physiological measures, and to motor performance prior to, during and after competition. In addition, the prediction that only somatic anxiety increases prior to competition was examined. Forty-one undergraduate males competed in a motor task while the experiments monitored heart rate and blood pressure responses. Each subject competed against a confederate for 10 experimental trials and completed the CSAI-2 prior to, during and after the competition. The results confirmed the multidimensional nature of the state anxiety construct and provided evidence for the independence

of cognitive worry and somatic anxiety. However both dimensions followed similar temporal patterns prior to and during competition. Finally, the results confirmed the non-significant relationship between psychological and physiological measures of anxiety.

Raglin and Marris\(^2\) conducted a study on nine members of a university women’s varsity volleyball team completed the state-trait anxiety inventory (STAI) before the beginning of the competitive season. Each athlete also completed the STAI on the basis of none she felt before her best competition. Four anxiety units were added and subtracted from this value to determine the zone of optimal function (ZOP) of each player. The athlete who completed the STAI according to none theory anticipated feeling before upcoming competitions 3 weeks and 2 days prior to an easy match and a difficult match. Actual pre-competition anxiety was assessed with the STAI-1 hour before each of the two competitions. As suggested by ZOF theory, considerable variability was found in the range of optimal and actual anxiety. Predictions of Pre-competitive anxiety made 3 weeks before competition were not significantly correlated with actual anxiety levels for either match. Predictions made 2 days before the match were

---

significantly correlated to actual anxiety for the difficult match, but not the easy match. Significantly more of the athletes possessed anxiety levels within the ZOF for the difficult match than for the easy match. The authors suggest that these results indicate that consistency in anxiety levels is not important for success in team sport athletes.

Vikki Krane and Jean Williams\(^3\) conducted a study to compare changes in cognitive anxiety, somatic anxiety and self-confidence prior to competition by high school gymnasts and collegiate golfers. A version of the competitive state anxiety inventory (CSAI-2) was administered 24 hrs., 1 hrs. and 10 minutes prior to competition. Results of ANOVA, showed the golfers and gymnasts to have different patterns of change in the CSAI-2 sub-components. The gymnasts displayed an increase in cognitive and somatic anxiety and a decrease in self-confidence while the golfers showed a decrease in cognitive anxiety, an increase in self-confidence and no change in somatic anxiety. Overall the golfers had lower cognitive and somatic anxiety and higher self confidence than the gymnasts. Multiple regression analysis indicated none of the CSAI-2 sub-components was able to significantly predict high school gymnastic and collegiate golf

\(^3\) Vikki Krane and Jean Williams, "Performance and Somatic Anxiety, Cognitive Anxiety and Confidence Changes Prior to Competition," Journal of Sports Behaviour Vol. 10 No. 1, 47.
performance. The results are discussed in terms of differences in sports, competitive conditions and skill and experience level.

Smith's develop a model of performance related anxiety to examine linked between perfectionism, achievement goals, and the temporal patterning of multi-dimensional state anxiety in 119 high school runners, instruments assessed achievement goal (Roberts & Balagne, 1998) Perfectionism (Frost, Marten Lahart 1990) and multidimensional state anxiety (Martens, Burton & Vealey, 1990) on 4 occasions prior to a cross country meet. Hierarchical regression analysis indicated that overall perfectionism was a consistent significant predictor of cognitive anxiety perceived ability was a consistent predictor of confidence and ego and task goals contributed to the prediction of cognitive anxiety and confidence, respectively concern over mistakes, doubts about action and personal standards were consistent predictors of Cognitive Anxiety, Somatic Anxiety and Self-Confident respectively.

---

Jones, Swaim and Cale\textsuperscript{5} examined changes in and antecedents of cognitive anxiety, somatic anxiety and self-confidence in a sample of male (n=28) and female (n=28) university athletes. Subjects responded to the competitive state anxiety Inventory-2 (Marten, Bustom, Vealey, Bump & Smith 1990) and six antecedent item during the week preceeding an important competition. In the case of cognitive anxiety, males showed no change across time, females showed a progressive increase as the competition neared, males and females showed the same patterning in somatic anxiety with increases occurring only on the day of competition, self-confidence scored revealed a reduction in self-confidence as the competition neared in both genders, but there was greater decrease in females than in males. Stepwise multiple, regression analysis showed that different antecedents predicted cognitive anxiety and self-confidence in males and females. Specifically, significant predictors in the females were associated with personal goals and standards. Significant predictors in the males were associated with interpersonal comparison and winning.

\textsuperscript{5} Graham Jones, Austin Swain and Andrew Cale, "Gender Differences in Pre-Competition Temporal Patterning and Antecedents of Anxiety and Self Confidence," \textit{Journal of Sport \\& Exercise Physiology} 13 (1991):1
Rodrigo, Lusiardo and Pereira\textsuperscript{6} examined how the component of the Spanish version of Competitive State Anxiety Inventory (CSAI-2) are related to each other and their relationship with performance in 51 male soccer players from our professional teams. The results indicated a moderate relationship between cognitive worry and somatic anxiety, confirming that these are separate, but related components of state anxiety. Also, cognitive worry was the more consistently and inversely related to performance. Finally, alpha coefficients of this Spanish version indicate that it is an interval reliable measure.

Graham Jones and Sheldon Hanton\textsuperscript{7} assessed differences in feeling states indicated by performers who reported being facilitated or debilitated by symptoms associated with competitive anxiety before competition. A sample of high-standard swimmers (n=190) completed a modified version of Competitive State Anxiety Inventory-2, including both intensity and direction subscales, and an exploratory checklist of feeling state labels, which comprised positive and negative feeling state labels. Our findings supported the general hypothesis that ‘facilitator’s report significantly more positive feelings than


\textsuperscript{7} Graham Jones, Sheldon Hanton, “Pre-Competitive Feeling States and Directional Anxiety Interpretations,” \textit{Journal of Sports Sciences} 19 (June, 2001), 385-395
'debilitators', who report significantly more negative feelings. Descriptive frequency counts of the largest percentage differences between 'facilitators' and 'debilitators' resulted in the selection of the 'confident' feeling state label on the positive subscales, with it being identified most frequently by the 'facilitators'. Furthermore, of the negative feelings, the groups indicated the label 'anxious' most frequently. This study has extended previous research into the notion of positive and negative anxiety and has revealed individual differences in the combination of feeling states experienced by performers during competition.

Martin Eubank and Dave Collins\(^8\) conducted a study to establish the extent to which the direction of anxiety is a dynamic or stable longitudinal response to stress and whether this patterning appears to be related to coping. Pre event, state anxiety intensity and direction data were obtained from 22 youth sports participants in the training and two competition environments within the same season, with the in event anxiety and coping data being obtained from the high-stress competition condition. The predispositional coping strategies of the participants were assessed by use of the trait version of the COPE

\(^8\) Martin Eubank and Dave Collins, "Coping with Pre and In Event Fluctuations in Competitive State Anxiety – A Longitudinal Approach," *Journal of Sports Sciences*, 18 (2000), 121-131
scale. The findings revealed significant differences in the patterning of anxiety direction between and within the facilitative and debilitating groups. This was accompanied by distinct qualitatively and quantitatively reported differences in the strategies of coping adopted by each group. Facilitators approached to use problem and emotion focused coping characteristics in response to stress, whereas debilitators appeared limited in their use of coping constructs, conceptually, the direction of anxiety would appear to be a mechanism that may, itself exist as a strong indicator that effective coping is taking place.

Sheldon, Stephen D., & Young⁹ conducted a study to examine retrospective perceptions and causal beliefs about temporal experiences of competitive anxiety and related symptoms in the lead up to competition. Qualitative interviews were conducted with 9 elite performers to examine the interaction of intensity, frequency and direction of symptoms associated with competitive anxiety before competition data analysis identified six causal networks that supported theoretical predictions suggesting that intensity of cognitive anxiety symptoms remained relatively stable in the lead up to competition,

---
whereas somatic anxiety peaked sharply at the onset of performance. Frequency of anxiety symptoms increased as the competition approached and changes in interpretation of anxiety symptoms were also reported, with self-confidence identified as a moderating variable. The findings highlight the dynamic properties of the stress response and emphasize the need to consider the idiosyncratic nature of the level, frequency and interpretation of performer's precompetitive experiences.

Jean A. Finn, the purpose of this study was to determine anxiety level of varsity women swimmers. The subjects were 43 from four northeastern colleges. The Mat 8 parallel form anxiety battery was used to determine the anxiety level of each swimmer in both situation. Anxiety scores were utilized to divide swimmers into two groups, (1) Subjects whose scores increased and (2) subjects whose scores decreased from the non competitive to pre-competitive situation. Swimming performance score were also utilized to divide the subjects in to two groups (1) subjects who improved and (2) subjects who were shown in performance from the practice to meet conditions. The result showed (1) No significant mean difference (0.05 level) between

---

anxiety levels of subjects in non-competitive and precompetitive situations, and (2) no significant difference is increased or decreased performance time of the swimmer from practice to meet to the situation between the two anxiety groups. The following conclusions were drawn:

1. Swimming was more similar to precision activities than gross motor activities since mean anxiety levels didn’t differ in non-competitive and pre-competitive situation

2. Anxiety level didn’t affect performance.

Howard K. Hall, Julie Mathews and Alastair W. Kera\textsuperscript{11} conducted study on high school runner in cross country meet to examine links between perfectionism achievement goals and temporal patterning of multi dimensional state anxiety they found that over all perfectionism was a consistent significant predictor of confidence and ego and tasks goals contributed to the prediction cognitive anxiety and confidence respectively.

Gaynor Parfitt and John Pates\textsuperscript{12} conducted a study which considered the influence of competitive anxiety and self confidence state responses upon components of performance. Basketball players (n=12) were trained to self-report their cognitive anxiety, somatic anxiety and self-confidence as a single response on several occasions immediately before going on count to play. Performance was video-recorded and aspects of performance that could be characterized as requiring either largely anaerobic power (height jumped) or working memory (successful passes and assists) were measured. Intra-individual performance scores computed from these measures and the data from seven matches were subjected to regression analysis and then hierarchical regression analysis. The results indicated that as anticipated, somatic anxiety positively predicted performance that involved anaerobic demands. Self-confidence, and not cognitive anxiety, was the main predictor of performance scores with working memory demands. It would appear that different competitive state responses exert differential effects upon aspect of actual performance. Identifying these differences will be valuable in recommending intervention strategies designed to facilitate performance.

Jones, Swain & Cale\textsuperscript{13} examined pre-race situational antecedents of somatic and cognitive anxiety and self-confidence in a group of elite collegiate middle-distance runners. These factors were assessed 1 hour prior to performance with the competitive state anxiety inventory-2, subjects also completed the pre-race questionnaire (PRQ), which assessed five situational antecedents of competitive anxiety. Perceived readiness, attitude towards previous performance, position goal, coach influence and external environment. Analysis indicated that cognitive anxiety was predicted by the first three factors. No factor were found to be significantly predictive of somatic anxiety. Perceived readiness and external environment predicted self-confidence. The findings suggest that cognitive anxiety and self-confidence share some, but not all, antecedents and that somatic anxiety does not seen to be related to performance expectations.

Peek\textsuperscript{14} examined 32 students in a volleyball class by diving them into two matched groups on the basis of the IPAI 8-parallel form anxiety test prior to 13 class meeting during which the French and copper serve and repeated volleyball test were given at the beginning,

\textsuperscript{13} Jones, G. J., Swain, A. & Cale A. "Antecedents of Multi-dimensional Competitive State Anxiety and Self Confidence in Elite Inter-Collegiate Middle-Distance Runners," The Sports Psychologist, 4 (1990), 107-118
\textsuperscript{14} Andean Peek, "Influence of Anxiety on Volleyball Skills," Completed Research in Health Education and Recreation 9 (1967): 88-89.
middle and end of the meeting. Induced anxiety was attempted by verbal and writing suggestions that inadequate test performance improved significantly on the skill test but the correlation between the anxiety and test performance were not significant. Induced anxiety produced significant changes in anxiety but the changes were not uniformly in same direction.

Griffiths, Steel and Vaccaro\textsuperscript{15} examined the relationship between the anxiety level of 62 beginning, scuba diving students and standardized that there was no relationship between anxiety and performance on relatively simple task, while there was a relationship between anxiety and performance on the more complex diving maneuvers.

Lampmon\textsuperscript{16} investigated the relationship of the psychological variable anxiety on the performance of competitive swimmers. Fifteen members of the University of Florida varsity swimming team served as subjects. An anxiety test was given to the swimmers before the session and approximately one hour before the competition conclusion drawn were an upward fluctuation in anxiety one hour before competition

\textsuperscript{15} T. J. Griffith, Doti Steel and P. Vaccaro, “Relationship between Anxiety and Performance in Scuba Diving,” \textit{Perceptual and Motor Skills} 48 (June 1979): 1009.

facilitates performance there were no significant difference in anxiety patterns between the two experienced groups. Swimmers performed better if their pre-heat anxiety level was relatively equal to or slightly above their pre-season anxiety level.

Betty K. Smith\textsuperscript{17} members of the 1977-78 South Dakota State University Basketball (n=12) were measured on state anxiety inventory (SAI); sports competition anxiety test (SCAT); pre game H.R.; game field goal%; and season five throw%, subjects in group one consisted of the players who attempted over 12.2 field goals during the session, while group 2 attempted 95 field goals or less. Results of ANOVA indicated significant (P<0.05) difference between groups on season field goal% and SAL A significant ‘r’ was found between scores on the SAI and SCAT.

Raglin J. S and Morris M.J.\textsuperscript{18} attempted to determine if tenets of ZOF theory held for athletes in a team sport, anxiety was measured using Spielberger's state-trait anxiety inventory (STAI) at the baseline and before easy and difficult competitions in nine members of a


\textsuperscript{18} Raglin J.S., Morris M.J., “Precompetition Anxiety in Women Volleyball Players: A Test of ZOF Theory in a Team Sport,” British Journal of Sports Medicine, 28(1), March 1994: 47-51
collegiate women's volleyball team. The ability to predict precompetition anxiety was assessed by having the athletes complete the STAI both 3 weeks and 2 days before each match according to how they thought they would feel 1 h before competition. Each athlete also completed the STAI on the basis of how she recalled feeling before her best competition. Four anxiety units were added and subtracted from this value to establish the ZOF of each player. Actual precompetition anxiety was assessed 1 h before each match. In accordance with ZOF theory, considerable variability was found in the range of optimal anxiety, and 55.5% of the team members reported performing best at either low or high levels of anxiety. The prediction of precompetition anxiety made 2 days before competition was significantly correlated to actual anxiety for the difficult match (r = 0.69, P < 0.05) but not the easy match (r = 0.21, P > 0.05). Predictions made 3 weeks before competition were not significant (P > 0.05). More (P < 0.05) of the player possessed anxiety levels within the ZOF for the difficult match compared with the easy match (77.7% versus 22.2%). In summary, athletes in the team sport of volleyball exhibit considerable variation in optimal precompetition anxiety in accordance with ZOF theory. As posited by ZOF theory, the athletes were able to predict anxiety before
a difficult match accurately and were more likely to have anxiety levels with ZOF.

Turner P.E and Raglin J.S\textsuperscript{19}, examined the influence of anxiety on sport performance using the inverted-U hypothesis and Zone of Optimal Function (ZOF) theory. Sixty-seven collegiate track and field athletes completed versions of the State-Trait Anxiety Inventory (STAI) to determine baseline state anxiety, recalled best anxiety, and precompetition anxiety. Precompetition state anxiety was determined 1 h before competition in four meets. Three variants of the inverted-U hypothesis were examined: 1) task-specific anxiety, 2) individualized median precompetition anxiety, and 3) mean precompetition anxiety. For ZOF, optimal anxiety was established from anxiety scores based on recalled best performance. Subjects were grouped as either inside or outside of optimal anxiety levels according to inverted-U or ZOF criteria. Mean group performance was determined by transforming individual results using intra- and inter-individual standards. ANOVA revealed that subjects possessing optimal anxiety according to inverted-U criteria performed no better (P > 0.05) than cases outside optimal. Subjects with precompetition anxiety values within their

individual ZOF performed significantly (P < 0.05) better than cases with anxiety outside ZOF for all contrasts. The largest (P < 0.05) performance decrements resulted when anxiety was within a 1 SD range above or below ZOF. These results indicate that ZOF theory was more efficacious than the variants of the inverted-U hypothesis examined.

Raglin J.S, Morgan W.P and Wise K.J\textsuperscript{20} attempted to test Hanin's theory of optimal function in 15 female high school swimmers. Each swimmer completed the State Anxiety Inventory (STAI) and the Body Awareness Scale (BAS) under the following conditions: I) baseline; II) retrospective recall of "best", "usual", and "worst" performances; III) 24 h prior to an easy and difficult dual meet with instructions to respond as to "how you think you will feel 1 h before the meet"; and IV) 1 h before the meets utilizing the standard ("right now") instructional set. Success was determined in each meet by two methods: 1) objective ratings based on comparisons with the average of times from previous meets; and 2) subjective ratings of performance made by the coach. In the difficult meet significant (P less than 0.01) increases in precompetition anxiety and body awareness occurred, and

the correlations between predicted and actual pre-competition were .95 (P less than 0.001) for both anxiety and body awareness. In the difficult meet swimmers subjectively classified as successful were more accurate (P less than 0.05) in predicting precompetition anxiety, and possessed pre-competition anxiety values that were closer to their recall of optimal pre-competition anxiety compared to the unsuccessful swimmers. No comparisons based on the objective classifications were significant, nor were any of the comparisons in the easy meet. The present findings support Hanin's optimal function theory.

Matheson H, Mathes S\textsuperscript{21} examined changes in cognitive anxiety, somatic anxiety, and self-confidence as measured by the Competitive State Anxiety Inventory-2 in a sample of 50 female high school gymnasts prior to their performances at a practice session, dual meet, and district championship meet. The purpose of the study was to examine (1) the relationship between state anxiety and performance setting, (2) experience, and (3) difficulty of the movement task. Analysis showed that at the dual meet athletes experienced significantly greater cognitive and somatic anxiety and lower self-confidence than at the practice or district championship. State anxiety

\textsuperscript{21} Matheson H, Mathes S, "Influence of Performance Setting, Experience and Difficulty of Routine on Precompetition Anxiety and Self-Confidence of High School Female Gymnasts." Perceptual Motor Skills, 72 (3, Part II), June 1991: 1099-1105
did not vary significantly with the athletes' over-all experience or the difficulty of the routines they performed. The unexpected finding that the dual meet was the most anxiety-provoking was attributed to the greater uncertainty of outcome in a competition and the fact that the dual meet occurred early in the season.

Finkenberg M.E, DiNucci J.N, McCune E.D and McCune S.L\textsuperscript{22} conducted study on 77 cheerleaders participating in a national collegiate championship competition were administered the Competitive State Anxiety Inventory-2 immediately prior to performance. Significant correlations were found between cognitive and somatic state anxiety, a finding consistent with previous research. Negative correlations were found between both cognitive and somatic anxiety and self-confidence, also as previously reported. Canonical discriminant analysis indicated that significant discrimination between the teams could be accomplished by a combination of the state-anxiety variables. Both groups, 36 men and 41 women, differed significantly from normative scores on the somatic subscale.

Kirkby R.J and Liu J. investigated precompetition anxiety and self-confidence in a sample of 132 male and 103 female Shanghai college athletes. The participants were administered the Competitive State Anxiety Inventory-2 of Martens, et al. 30 to 40 min. before competing in important track and field events or basketball games. Analysis by independent t tests showed that there were no sex differences in scores on the Cognitive Anxiety, Somatic Anxiety, or Self-confidence subscales; however, compared to those in team sports (basketball), athletes competing individually (track and field) scored significantly higher on the Somatic Anxiety subscale and significantly lower on the Self-confidence subscale. Comparisons with data from comparable North American samples indicated that Chinese athletes reported lower scores on Cognitive Anxiety and Somatic Anxiety but similar scores on Self-confidence.

Wiggins M.S and Brustad R.J conducted study to examine expectations of performance and the directionality of anxiety. Directionality refers to the facilitative or debilitative aspects of anxiety. Subjects were 91 athletes competing in soccer, swimming, and track

---

and field. The Competitive State Anxiety Inventory-2 with an added Facilitative/Debilitative scale and Expectation of Performance scale was employed. Analysis showed that athletes with lower scores on cognitive and somatic anxiety, and higher scores on self-confidence perceived their anxiety as more facilitative of performance. These athletes also had significantly higher scores on the Expectation of Performance scale.

Williams D.M, Frank M.L and Lester D.\(^{25}\) investigated the relationship between attitudes toward winning and competitive anxiety was explored in 59 undergraduate students competing on four different New Jersey-based, NCAA Division III sports teams. In a backward multiple regression analysis, cognitive anxiety was predicted significantly only by self-confidence, while somatic anxiety was predicted significantly by self-confidence and the rated importance of the competition.

Lane A., Terry P. and Karageorghis C.\(^{26}\) conducted study to explore the situational antecedents of multidimensional state anxiety


among competitors in the sport of duathlon (run/cycle/run). Subjects (N = 122; Age: M = 28.3 yr., SD = 7.8 yr.) completed the Competitive Sport Anxiety Inventory-2 1 hr. before competition. In addition, they completed a 21-item Prerace Questionnaire modified for duathlon on which scores were factor analysed. Six factors accounted for 73.5% of the variance, similar to those identified by Jones, et al. in 1990. Stepwise multiple regression indicated that race goals and perceived readiness were significant predictors of cognitive anxiety, somatic anxiety, and self-confidence. Self-confidence was also predicted by attitude toward previous performance. This finding supports the proposal that these anxiety subcomponents share common antecedents but challenges the notion that cognitive and somatic anxiety also have unique antecedents.