

ANTECEDENTS OF STATE ANXIETY IN RUGBY¹

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Summary. -- The purpose of this study was to extend research investigating the antecedents of multidimensional state anxiety into the sport of rugby. Participants ($N=86$; Age: $M=23.7$ yr., $SD=4.8$ yr.) completed a 10-item Prematch Questionnaire developed to assess the antecedents of anxiety and the Competitive State Anxiety Inventory-2 1 hr. prior to competition. Factor analysis of intercorrelations of scores on the Prematch Questionnaire indicated that three factors accounted for 63.3% of the variance. These were labelled Perceived Readiness, Match Conditions, and Coach Influence. Stepwise multiple regression indicated that Perceived Readiness predicted rated Self-confidence and Somatic Anxiety. Game conditions also predicted Self-confidence. Collectively, these factors accounted for 30% of Self-confidence and 11% of Somatic Anxiety. No factor predicted Cognitive Anxiety. Findings support the notion that each sport has unique stressors and that researchers should seek sport-specific measures of the antecedents of anxiety (Lane, Terry, & Karageorghis, 1995a, 1995b).

It has been argued that anxiety should be viewed as a multidimensional construct. Martens, Vealey, and Burton (1990) based this argument on the proposals of Morris, Davis, and Hutchings (1981) that subcomponents of anxiety are affected by different antecedents and relate to performance in differently. Much of recent research has focused on anxiety and performance relationships, however the antecedents of anxiety have not received adequate attention (Jones, 1995). It has been suggested that the identification of the antecedents of anxiety may not only aid in conceptual clarity, but also help in the design of interventions for stress management (Hardy & Jones, 1994; Martens *et al.*, 1990).

Cognitive anxiety is typified by worry and negative expectations about performance, while self-confidence is typified by strong beliefs in ability to achieve a desired outcome. Research concurs with the proposal that self-confidence and cognitive anxiety are both related to factors in the environment which influence perceptions of success or failure (Gould, Petchlikoff, & Weinberg, 1984; Hanton & Jones, 1994; Jones, Swain, & Cale, 1990; 1991; Lane, Terry, & Karageorghis, 1995a; 1995b). Somatic anxiety, the physical manifestations of anxiety, is hypothesized to relate to nonevaluative cues such as pre-event warmup routines and has produced equivocal findings (Jones, *et al.*, 1991; Lane, *et al.*, 1995a; 1995b). Lane, *et al.* (1995a; 1995b) suggested that the significant relationship between cognitive and somatic anxiety increases the likelihood of identifying common antecedents.

Recent research has used the Prerace Questionnaire (Jones, *et al.*, 1990) to facilitate a comparison of the antecedents of anxiety in sports of middle-distance running (Jones, *et al.*, 1990), swimming (Hanton & Jones, 1994), duathlon (Lane, *et al.*, 1995a), and triathlon (Lane, *et al.*, 1995b). Findings indicate that in sports which appear similar in nature, subcomponents of anxiety are influenced by factors which are specific to the sport under investigation. Furthermore, a comparison of the factor structure of the Prerace Questionnaire across different sports indicates that participants conceptualize the experience in ways unique to each sport (Lane, *et al.*, 1995a, 1995b).

There is a dearth of research into the antecedents of anxiety in team sports. From a study of 28 male and 28 female hockey and rugby players, Jones, *et al.* (1991) found that

sex influences the antecedents of anxiety, in that anxiety in males is influenced by perceptions of winning and losing, whereas females were more influenced by the importance of performing well in the competition in relation to previous performances. The relatively small sample size and the use of a single item to assess each antecedent of anxiety precludes meaningful comparisons of these findings with previous research.

The primary purpose of the present study was to extend the investigation of the antecedents of anxiety to a team sport. The secondary purpose was to examine the extent to which participants develop sport-specific constructs expectations about performance in rugby league. We chose rugby league because it is a team game consisting of 13 players per side. It is a fast moving interactive contact sport played mainly in England and in the Southern Hemisphere. It should not be confused with rugby union which is a 15-a-side game involving a higher proportion of physical contact.

Participants

Participants were 86 male rugby players ranging from 16 to 35 years old ($M=23.7$ yr., $SD=4.8$). They were moderately experienced with an average of 9 years of playing experience ($SD=6.3$ yrs.). Participants were drawn from three university teams and six Southern England clubs.

Measurement of Anxiety Antecedents

The antecedents of anxiety were assessed using a 10-item Prematch Questionnaire which was based on the Prerace Questionnaire (Jones, *et al.*, 1990). The original Prerace Questionnaire included 19-items from which factor analysis produced four factors: Perceived Readiness, Position Goal, Coach Influence, and External Environment. Lane, *et al.* (1995a, 1995b) modified the Prerace Questionnaire for use with duathletes (21 items) and triathletes (23 items). Factor analysis of the Prerace Questionnaire in duathletes and triathletes indicated that Perceived Readiness items split into two factors: Perceived Readiness and Recent Form. All three factor analytic studies have consistently supported the Coach's Influence and Environment Conditions factors.

The Prerace Questionnaire was modified for use with rugby using interviews with rugby players who indicated the situational variables which they felt influenced anxiety immediately prior to competition. Modifications included removing items which related

to finish time and position and items regarding both the last race and the next race. Rugby players identified performance goals specific to their sport. This resulted in a 10-item questionnaire structured under two headings. The first section headed “About the last few weeks” included items which rate performance in training. Examples include, “How well have you been performing in matches in the last 4 weeks?” and “How do you feel your coach has influenced your performance in the last 4 weeks?”. The second section headed, “The Next Game”, included items such as “Do you feel mentally ready for this next match?” and “Do you feel physically ready for this next match?”. Examples of match goals included “Not to miss any tackles” and to “Maintain discipline”. All items were rated on a 9-point scale anchored by phrases such as 1 (“extremely poorly”) to 9 (“extremely well”) or 1 (“not at all”) to 9 (“Very much so”).

Measurement of State Anxiety

State anxiety was measured using the Competitive State Anxiety Inventory-2 (Martens, Burton, Vealey, Bump, & Smith, 1990) which has 27-items, with nine items in each of the three subscales, Cognitive Anxiety, Somatic Anxiety, and Self-confidence. Examples of items in Cognitive Anxiety include “I am concerned about this competition” and “I’m concerned that I won’t be able to concentrate”, while Somatic Anxiety items include “I feel nervous” and “My body feels tight”. Self-confidence items include “I feel self-confident” and “I am confident I can meet the challenge”. Items are rated on a 4-point scale anchored by 1 (“Not at all”) and 4 (“Very much so”). Martens, *et al.* (1990) reported internal consistency coefficients ranging from .79 to .90.

Procedure

The two scales were administered 1 hr. prior to competition using the protocol, “How are you feeling right now?”. Prior to completing the two scales the Martens (1990) “anti-social desirability” statement which was read out aloud which assures confidentiality and encourages the respondent to answer honestly. To assess the suitability of the factor structure of the Prematch Questionnaire for use with Rugby players, data were subjected to principal components analysis and then rotated by varimax. The Cronbach alpha (1951) estimate for internal consistency was calculated for the resultant factors. After three multivariate outliers were identified and removed (see Tabachnick & Fidell, 1996), data

were analyzed using three stepwise multiple regression equations with scores on the subscales of the Competitive State Anxiety-2 as the dependent measures and scores on the Prematch Questionnaire factor scores as the independent measures.

RESULTS AND DISCUSSION

Insert Table 1 about here

Factor Analysis of the Prematch Questionnaire

Factor analysis of responses to the Prematch Questionnaire produced three factors which accounted for 63.3% of the variance (see Table 1). Factor 1, Perceived Readiness, contained five items which related to confidence in winning the next game, mental readiness, physical readiness, rated performance in training, and rated performance in matches in the last four weeks. The context of the factor Perceived Readiness suggests that in rugby, expectations of positive performance are contained in a single factor. The factor Perceived Readiness in rugby is similar to the factor identified in middle-distance runners (Jones, *et al.*, 1990).

Factor 2, Match Conditions, contained two items related to weather and pitch conditions. Factor 3, Coach's Influence, contained two items relating to the perceived influence of the coach on performance. The factors Match Conditions and Coach Influence are similar to those identified by duathletes, middle-distance runners and triathletes. Internal consistency coefficients for the three factors indicate reliability (see Table 2).

Factor analysis of responses to the Prematch Questionnaire indicated the extent to which each sport has unique constructs of performance expectation. In contrast to the factor structure in duathlon, triathlon, and middle-distance running, items regarding individual goals failed to emerge as an independent factor. This supports the proposal of Lane, *et al.* (1995a) that researchers should seek sport-specific measurements of the antecedents of anxiety rather than applying the same constructs across sports.

Insert Table 2 about here

Prediction of State Anxiety

Stepwise multiple regression to predict subcomponents of state anxiety from Prematch Questionnaire scores is contained in Table 3. The results indicated that Perceived Readiness significantly predicted Self-confidence and Somatic Anxiety. Self-confidence was also predicted by Match Conditions. Collectively, these factors accounted for 30% of the variance in scores on Self-confidence and 11% of variance in Somatic Anxiety. No scores on the Prematch Questionnaire significantly predicted Cognitive Anxiety. As scores on Perceived Readiness increased, scores on Self-confidence increased and those on Somatic Anxiety decreased. As Match Conditions were viewed as more favourable ratings of Self-confidence increased.

Insert Table 3 about here

The findings that Perceived Readiness and Match Conditions emerged as antecedents of Self-confidence support the proposal that self-confidence is related to environmental cues which influence perceptions of success or failure (Gould, et al., 1984; Hanton & Jones, 1994; Lane et al., 1995, 1995b; Martens, et al., 1990). The finding that scores on a self-evaluative construct such as Perceived Readiness are related to Somatic Anxiety contrasts with theoretical proposals on the nature of somatic anxiety (Martens, et al., 1990). Although self-confidence and somatic responses are hypothesized to be conceptually independent, Morris, et al. (1990) noted that they can be experienced simultaneously in certain situations. Sports research has consistently found significant relationships among subcomponents of anxiety, hence, this increases the likelihood of finding common antecedents (Lane, et al., 1995a; 1995b; Martens, et al., 1990).

A second possible explanation for finding a common antecedent may be that the influence of self-confidence triggers responses of somatic anxiety (Borkovec, 1976). Low self-confidence which derives from negative talk and self-images may intensify somatic anxiety responses. Research into interventions to control anxiety indicates that subcomponents of anxiety are influenced by common strategies for intervention (Terry,

Coakley, & Karageorghis, 1995). Collectively, findings suggest that factors which influence the ratings on one subscale are associated with changes in scores on the other subscales, indicating that although cognitive and somatic subcomponents are conceptually independent, researchers need to consider the interactions among them.

In the present study, no factor predicted Cognitive Anxiety. This contrasts with previous research which concurs that across a range of different sports, an outcome goal (e.g., position goal) relates to Cognitive Anxiety (Hanton & Jones, 1994; Jones, *et al.*, 1990; Lane, *et al.*, 1995a, 1995b). As rugby is a team game, it is suggested that Cognitive Anxiety may be related to the collective efficacy of the team toward achieving a win. Hence, it can be argued that Cognitive Anxiety is mediated by team cohesiveness (see, Prapavessis & Carron, 1996).

Conclusions

The identification of Perceived Readiness and Match Conditions as predictors of self-confidence is consistent with theoretical proposals that self-confidence is related to factors which influence perceptions of success or failure (Martens, *et al.*, 1990). It is suggested that researchers should continue the investigation of state anxiety antecedents across different sports. It is also recommended that researchers develop measures of the antecedents of anxiety which are specific to the sport under investigation rather than applying the same constructs across sports.

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matching hypothesis. Perceptual and Motor Skills, 81, 287-296.

Table 1

Factor Loadings of the Prematch Questionnaire after Varimax Rotation

Variable	1	2	3
Do you feel mentally ready for this next match?	.79		
Do you feel physically ready for this next match?	.79		
How well have you been performing in matches in the last 4 weeks?	.67		
How well have been performing in training in the last 4 weeks?	.65		
How confident are you that your team will win this match?	.59		
How suitable are running conditions for you in this next match?		.92	
How suitable are weather conditions for you in this next match?		.91	
How do you feel your coach influence your performance in the last game?			.86
How do you feel your coach has influenced your performance in training the last 4 weeks?			.77
Eigenvalue	3.04	1.70	1.59
% of variance	30.4	17.0	15.9
Cumulative % variance	30.4	47.4	63.3

Table 2

Cronbach Alpha Estimate for Internal Consistency of Prematch Questionnaire Factors

Factor	Coefficient Alpha
Perceived readiness	.75
Game conditions	.88
Coach influence	.70

Table 3

Stepwise Multiple Regression Summary: Significant Predictors of Cognitive Anxiety, Somatic Anxiety, and Self-confidence

Competitive State Anxiety Inventory-2	Factor	Multiple <u>R</u>	<u>R</u> ²
Cognitive Anxiety	No significant predictors		
Somatic Anxiety			
Step 1	Perceived readiness	.34*	.11
Self-confidence			
Step 1	Perceived readiness	.51*	.25
Step 2	Game conditions	.57*	.30

* $p < .01$

Note.- Multiple R is cumulative