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## The Effect of Role Ambiguity on Competitive State Anxiety

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The purpose of this study was to examine the relationship between role ambiguity and precompetition state anxiety (A-state). Consistent with multidimensional anxiety theory (Martens, Vealey, & Burton, 1990), it was hypothesized that role ambiguity would be positively related to cognitive but not to somatic A-state. Based on the conceptual model presented by Beauchamp, Bray, Eys, and Carron (2002), role ambiguity in sport was operationalized as a multidimensional construct (i.e., scope of responsibilities, role behaviors, role evaluation, and role consequences) potentially manifested in each of two contexts, offense and defense. Consistent with hypotheses, ambiguity in terms of the scope of offensive role responsibilities predicted cognitive A-state ( $R^2 = .19$ ). However, contrary to hypotheses, offensive role-consequences ambiguity also predicted somatic A-state ( $R^2 = .09$ ). Results highlight the importance of using a multidimensional approach to investigate role ambiguity in sport and are discussed in terms of both theory advancement and possible interventions.

**Key Words:** field hockey, multidimensional, interdependence

The topic of competitive state anxiety (A-state) in sport has received considerable empirical attention in recent years (cf. Burton, 1998; Jones & Hardy, 1990; Martens, Vealey, & Burton, 1990; Woodman & Hardy, 2001). A great deal of this research has utilized the multidimensional framework provided by Martens, Vealey, and Burton (1990) that distinguishes between cognitive and somatic anxiety components as measured by the Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, Vealey, Bump, & Smith, 1990). In their multidimensional anxiety theory, Martens, Vealey, and Burton (1990) proposed that cognitive and somatic anxiety are brought about by different antecedents. Cognitive anxiety is thought to arise from environmental factors related to an athlete's expectation of successful

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performance or negative self-evaluation. Somatic anxiety, on the other hand, is thought to arise from conditioned responses to nonevaluative stimuli, such as the presence of an audience (Jones, 1995; Martens, Vealey, & Burton, 1990; Morris, Davis, & Hutchings, 1981).

Research has found competitive A-state to be influenced by a number of individual difference and situational variables. From an individual difference perspective, A-state has been found to be associated with goal orientations (Ntoumanis & Biddle, 1998), trait anxiety (Crocker, Alderman, & Smith, 1988), performance expectations (Krane, Williams, & Feltz, 1992), evaluation concerns (Bray, Martin, & Widmeyer, 2000), competitive level (Hammermeister & Burton, 1995), and gender (Jones & Cale, 1989). From a situational perspective, A-state has also been found to be related to factors such as task complexity (Krane & Williams, 1994), an opponent's ability (Thuot, Kavouras, & Kenefick, 1998), game location (Terry, Walrond, & Carron, 1998), and sport type (Martens, Vealey, & Burton, 1990).

Although research on situational factors relating to state anxiety has been extensive, it is somewhat surprising that few studies have examined team-related factors that may have an impact on competitive A-state in sport teams. This is particularly surprising, given that group dynamics theorists have long since ascertained that group-related variables contribute to team member affect (cf. Baumeister & Leary, 1995; Schutz, 1958; Shaw, 1981). One possible explanation for the paucity of A-state research in the context of sport teams may be traced to Martens, Burton, et al.'s (1990) suggestion that A-state is less prominent in team sports because the responsibility for negative outcomes is diffused, thereby reducing the evaluative threat to individual team members. In support of this contention, Martens, Burton, et al. documented significantly higher levels of precompetitive state anxiety among individual-sport athletes compared to those participating in team sports.

Although the diffusion of responsibility for poor performance may serve to insulate team-sport athletes from anxiety arising from sources outside the team, these athletes may be vulnerable to thoughts and feelings of anxiety associated with factors inherent to the team or membership within it. Indeed, what little research has been carried out on anxiety in team sport shows there are numerous factors peculiar to membership on a team that may have an impact on state anxiety. For example, in a series of studies with Russian athletes, Hanin (1989) reported that team atmosphere, member experience, and member status were associated with team member A-state.

More recently, Prapavessis and Carron (1996) found that task cohesion was negatively related to competitive state anxiety responses of athletes from a variety of interdependent team sports. Specifically, individuals with higher perceptions of Individual Attractions to the Group-Task (ATG-T) reported lower levels of precompetitive cognitive A-state than athletes who felt less attraction to the group. Mediation analysis also showed that the relationship between ATG-T and cognitive A-state was explained by team members' feelings about the pressure to carry out group responsibilities and satisfy the expectations of other team members. Considered together, the results of the Hanin and Prapavessis and Carron studies indicate that although a diffusion of responsibility may serve to protect members of sport teams from direct performance evaluation, other team dynamics factors may nonetheless influence state anxiety.

There is evidence that *role ambiguity* is a team-dynamics factor with the potential to have an impact on sport competition anxiety. Role ambiguity occurs when an individual perceives a lack of clear information associated with a particular role (Kahn, Wolfe, Quinn, Snoek, & Rosenthal, 1964). In their multidimensional theory of anxiety, Martens, Vealey, and Burton (1990) indicated that *uncertainty* is an important situational antecedent to perceptions of anxiety. While uncertainty and ambiguity are not synonymous constructs, the two perceptions are closely linked insofar as individual roles are concerned (Beehr & Bhagat, 1985; Beehr & Newman, 1978). For example, in their *role episode model*, Kahn et al. (1964) indicated that when individuals experience role ambiguity (i.e., lack of clear information), uncertainty follows.

Also, Martens, Vealey, and Burton (1990) noted that when individuals are subject to perceptions of uncertainty and have no appropriate response for dealing with that uncertainty, distress and anxiety ensue. Consistent with this notion, Kahn et al. (1964) theorized that for role occupants, "the greater the experience of [role] ambiguity, the more the person experiences tension and anxiety" (p. 24). Kahn et al.'s proposition has been empirically supported by the results of over 20 studies in industrial and organizational settings (cf. Jackson & Schuler, 1985). In general, those studies showed a positive relationship between role ambiguity and job related anxiety.

To date, only one study has examined the relationship between role ambiguity and anxiety in competitive sport. In that study, Eys and Carron (2000) reported that role ambiguity was positively related to *trait* competition anxiety in a sample of university basketball players. Specifically, team members who were less clear about the scope of responsibilities associated with their role on the team reported higher levels of one form of trait anxiety—worry. Thus, there is some evidence indicating a relationship between role ambiguity and sport competition anxiety; however, a potential relationship between role ambiguity and competitive state anxiety has yet to be examined.

The purpose of the present study was to investigate the relationship between role ambiguity and precompetition state anxiety for athletes in the team sport of field hockey. Based on the theorizing by Martens, Vealey, and Burton (1990) outlined above and the preliminary evidence reported by Eys and Carron (2000), the general hypothesis tested was that team members' perceptions of role ambiguity would be positively associated with their precompetition A-state. However, because both role ambiguity and precompetition state anxiety are conceptually and operationally defined as multidimensional constructs, a number of specific a priori hypotheses were also advanced that took into account the differences among the dimensions assumed to represent the two constructs.

Insofar as role ambiguity is concerned, Beauchamp, Bray, Eys, and Carron (2002) presented a conceptual model for sport. That model emanated from theorizing by Kahn et al. (1964), as well as earlier work by Eys and Carron (2000, 2001) and by Beauchamp and Bray (2001). Specifically, it was proposed that the main variance in role ambiguity in sport is accounted for by ambiguity related to (a) the scope of one's responsibilities, (b) the behaviors associated with one's role, (c) how one's role is evaluated, and (d) the consequences of failing to fulfill one's role in the two fundamental sport contexts of offense and defense. In their study of male rugby players, Beauchamp et al. (2002) found that ambiguity related to all

four dimensions was independently predictive of role efficacy and role performance effectiveness. Thus, there is some evidence for the potential utility of examining multiple dimensions of role ambiguity in interdependent sport teams in relation to specific psychological and behavioral outcomes.

It was pointed out above that precompetitive state anxiety is also considered to be a multidimensional construct (Martens, Vealey, & Burton, 1990) that is composed of both cognitive and somatic A-state dimensions. Further, it has been conceptually proposed and empirically demonstrated that the antecedents of the dimensions are different (cf. Martens, Vealey, & Burton, 1990). On the one hand, cognitive anxiety is theorized to arise from environmental factors related to performance expectancies (Martens, Vealey, & Burton, 1990). Similarly, role ambiguity is an environmental factor that has been found to be related to task-related efficacy expectancies (Beauchamp & Bray, 2001; Beauchamp et al., 2002; Eys & Carron, 2001) as well as role performance (Beauchamp et al., 2002). Thus, for the present study we hypothesized that role ambiguity would be positively associated with cognitive A-state. On the other hand, somatic anxiety is theorized to arise from conditioned responses to nonevaluative stimuli (Martens, Vealey, & Burton, 1990). Thus we hypothesized that role ambiguity and somatic state anxiety would be unrelated.

The specific hypotheses outlined above are derived from theory and research relating to perceptions of role ambiguity *in general*. There is currently no theoretical basis upon which to hypothesize a pattern of relationships between cognitive state anxiety and the *specific* manifestations of ambiguity. Given that each manifestation of role ambiguity proposed by Beauchamp et al. (2002) represents a form of role stress as defined by Kahn et al. (1964), it was hypothesized that cognitive state anxiety would be positively related to each of the separate dimensions of role ambiguity.

## Method

### *Participants*

Secondary school ( $M$  age = 15.53 years,  $SD$  = 1.52) field hockey players from the United Kingdom participated in the study, 48 boys and 66 girls ( $N$  = 114). They had an average of 6.15 years ( $SD$  = 2.49) of playing experience in competitive field hockey. Players had practiced for 5 weeks and played an average of 4 games with their present team prior to completing the first questionnaire. The level of competition represented in the sample was of a high standard, with many athletes having played on county or divisional representative teams. For example, as part of their regular team engagement, participants took part in structured practices 3 to 5 times per week.

### *Measures*

*Role Identification Process.* Consistent with procedures outlined by Beauchamp and Bray (2001), initial instructions had participants identify their formal interdependent role responsibilities for offensive and defensive play. That is, the athletes were provided with a definition of what a role is. They were then asked to differentiate their offensive and defensive role responsibilities within their overall role on the team. Examples of specific offensive and defensive role responsibilities from field hockey were provided (e.g., beat defenders on either side

and center the ball accurately, close down players quickly and apply pressure). Finally, the participants were asked for a written description of their primary offensive and defensive formal role responsibilities. This created a frame of reference upon which the athletes could base their responses to the questions measuring role ambiguity.

*Role Ambiguity.* Role ambiguity was measured using the scale developed by Beauchamp et al. (2002). This is a multidimensional scale that measures four types of ambiguity experienced by sport-team athletes in relation to their formal interdependent role responsibilities. The instrument focuses on three key features of roles. First, role ambiguity is assessed in relation to perceived (i.e., subjective) ambiguity as defined by Kahn et al. (1964). Second, because formal roles as directly prescribed to team members by the coach dictate the task-related responsibilities associated with task performance (Carron & Hausenblas, 1998), only perceptions relating to team members' formal roles (i.e., as opposed to informal roles; Mabry & Barnes, 1980) are measured. Finally, the measure aims to capture perceived role ambiguity in relation to the major behavioral contexts in which all members of interdependent sport teams have formal roles, namely offense and defense.

The 40-item Role Ambiguity Scale (20 items for offense, 20 items for defense) measures ambiguity in relation to an individual's (a) scope of role responsibilities (5 items), (b) role behaviors (5 items), (c) role evaluation (5 items), and (d) role consequences (5 items) for offense and defense. Ambiguity related to *scope of responsibilities* represents a perceived lack of clear information about the breadth of one's duties and/or responsibilities. An example of an item used to measure this dimension is, "I am clear about the different responsibilities that make up my role." *Role behavior ambiguity* represents a perceived lack of clear information about the behaviors required for performing one's role responsibilities. An example of a role behavior ambiguity item is, "I understand what adjustments to my behavior need to be made to carry out my role." *Role evaluation ambiguity* represents a perceived lack of clear information regarding how one's role-related responsibilities are evaluated. An example of an item used to measure role evaluation ambiguity is, "I understand the criteria by which my role responsibilities are evaluated." Finally, *role consequences ambiguity* refers to a perceived lack of clear information about the consequences of failing to fulfill one's role responsibilities. An example of a role-consequences ambiguity item is, "I know what will happen if I don't perform my role responsibilities."

Athletes rated their agreement with each item on a 9-point Likert scale anchored by 1 ("strongly agree") and 9 ("strongly disagree"), with higher scores reflecting greater role ambiguity and less role clarity. As indicated above, consistent with procedures employed by Beauchamp et al. (2002), role ambiguity was assessed in the major sport-specific contexts in which sport-team members have formal roles, namely offense and defense. Cronbach alpha coefficients for each role ambiguity subscale were acceptable based on Nunnally's (1978) criterion of greater than .70 for the psychological domain. Internal consistencies for each role ambiguity subscale from the sample used in the current study are listed in Table 1.

*Competitive State Anxiety.* The Competitive State Anxiety Inventory-2 (CSAI-2; Martens, Burton, et al., 1990) was used to assess precompetition state anxiety. The CSAI-2 is a 27-item inventory composed of three 9-item subscales

**Table 1** Descriptive Statistics for Role Ambiguity and State Anxiety

		Combined		Boys		Girls		$\alpha$
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
Role ambiguity –Offense	Scope of responsibilities	3.36	1.24	3.08	1.21	3.58	1.23*	.79
	Role behavior	3.25	1.25	2.95	1.16	3.48	1.28*	.81
	Role evaluation	3.70	1.40	3.28	1.19	4.02	1.47**	.87
	Role consequences	3.14	1.34	2.85	1.31	3.37	1.32*	.81
Role ambiguity –Defense	Scope of responsibilities	3.25	1.31	3.20	1.29	3.30	1.34	.82
	Role behavior	3.20	1.39	3.09	1.38	3.29	1.40	.89
	Role evaluation	3.54	1.43	3.33	1.38	3.69	1.46	.91
	Role consequences	2.86	1.37	2.66	1.31	3.03	1.41	.89
A-state	Cognitive	20.89	5.08	19.59	4.70	21.83	5.17*	.81
	Somatic	15.24	5.19	13.77	4.13	16.32	5.64*	.85

*Note:*  $N = 114$  (48 boys, 66 girls). Scores for role ambiguity dimensions can range from 1 to 9; Scores for cognitive and somatic A-state dimensions can range from 9 to 36.

\* $p < .05$ , \*\* $p < .01$

that measure cognitive anxiety, somatic anxiety, and self-confidence. Items are rated on a 4-point scale anchored by 1 (“not at all”) and 4 (“extremely”), with larger scores reflecting greater A-state and self-confidence. Only the cognitive and somatic anxiety subscales were used in the present study. An extensive body of research has provided evidence for the reliability and validity of each of these subscales (Martens, Burton, et al., 1990). For our data, Cronbach alpha coefficients of .81 and .85 were obtained for the cognitive and somatic state anxiety scales, respectively.

### *Procedures*

Athletes were recruited by the first author through initial contact with each team’s head coach. In order to allow time for players’ formal interdependent role responsibilities to become established, questionnaires measuring role ambiguity and a number of demographic and practice behavior variables were administered approximately 5 weeks into the competitive season during a 1-week period. In order to avoid competition-specific bias, questionnaires were completed at a team meeting held neither immediately before nor after competition. The athletes were informed that the study was voluntary; they were assured of confidentiality, and both parental and participant consent was obtained. Two to 3 days after the first

questionnaire was administered, players completed the CSAI-2 approximately 1/2 hour prior to their next game. The instructions of Martens, Burton, et al. (1990) for the administration of the CSAI-2 were carefully followed. Athletes were further assured of confidentiality and thanked for their participation in the research.

## Results

### *Preliminary Analyses*

Given that previous research has found males and females to differ in their experience of competitive A-state (e.g., Jones & Cale, 1989; Krane & Williams, 1994), initially a 2 (male, female)  $\times$  10 (8 role ambiguity scales, 2 precompetition anxiety scales) MANOVA was conducted. The overall main effect for sex was not statistically significant, Wilks' lambda = .86,  $F(10, 97) = 1.61, p = .12$ . However, a closer look at both the mean scores and univariate statistics (see Table 1) suggested a need for caution before collapsing together the scores for boys and girls. That is, although there were no significant differences between the sexes insofar as the defensive role-ambiguity data were concerned, significant differences were recorded for all four offensive role-ambiguity dimensions as well as both A-state dimensions,  $p < .05$ . Thus, as a cautionary procedure, analyses were carried out independently with the male and female samples as well as with these samples combined.

### *Descriptive Statistics*

Descriptive statistics are presented in Table 1. For both sexes, relatively low mean scores were observed for all offensive and defensive role-ambiguity dimensions. As noted above, although no differences were recorded between boys and girls with regard to the defensive role-ambiguity dimensions, girls reported significantly,  $p < .05$ , greater role ambiguity than boys with regard to the four offensive role-ambiguity dimensions. Also, consistent with previous research (e.g., Jones & Cale, 1989), girls reported experiencing significantly,  $p < .05$ , greater cognitive and somatic anxiety than boys prior to competition.

Bivariate correlations between the variables for the overall sample are presented in Table 2. Bivariate correlations for both samples are listed in Table 3. The results in Table 3 show that: (a) different dimensions of offensive role ambiguity are positively associated with both cognitive and somatic A-state for boys; (b) different offensive role-ambiguity dimensions are positively associated with cognitive, but not somatic, A-state for girls; and (c) none of the defensive role-ambiguity dimensions are correlated,  $p > .05$ , with either cognitive or somatic anxiety dimensions for either sex.

### *Relationships Between Role Ambiguity and Cognitive State Anxiety*

In order to determine the relationship between role ambiguity and cognitive state anxiety, we conducted separate regression analyses for boys and girls as well as for the overall sample. It was hypothesized that role ambiguity would be positively related to cognitive A-state. However, there was no theoretical basis for predicting, a priori, the strength of relationship with the separate role-ambiguity dimensions. In short, our research involved "model-building rather than model-



**Table 2 Intercorrelations Between Role Ambiguity and State Anxiety**

	2	3	4	5	6	7	8	9	10
Role ambiguity -Offense									
1. Scope of responsibilities	.78**	.71**	.64**	.45**	.43**	.41**	.36**	.44**	.29**
2. Role behavior	—	.74**	.68**	.45**	.58**	.53**	.49**	.26**	.20*
3. Role evaluation	—	—	.54**	.35**	.46**	.65**	.28**	.38**	.20*
4. Role consequences	—	—	—	.27**	.31**	.31**	.48**	.32**	.30**
Role ambiguity -Defense									
5. Scope of responsibilities	—	—	—	—	.77**	.70**	.66**	.19*	.13
6. Role behavior	—	—	—	—	—	.82**	.64**	.14	.17
7. Role evaluation	—	—	—	—	—	—	.57**	.19*	.17
8. Role consequences	—	—	—	—	—	—	—	.14	.16
A-State									
9. Cognitive	—	—	—	—	—	—	—	—	.65**
10. Somatic	—	—	—	—	—	—	—	—	—

*Note:*  $N = 114$ . \* $p < .05$ , \*\* $p < .01$

Table 3 Intercorrelations Between Role Ambiguity and State Anxiety for Boys and Girls

	1	2	3	4	5	6	7	8	9	10
Role ambiguity -Offense										
1. Scope of responsibilities	—	.75**	.66**	.70**	.23	.20	.16	.22	.44**	.43**
2. Role behavior	.78**	—	.63**	.65**	.22	.32*	.23	.25	.27	.26
3. Role evaluation	.72**	.78**	—	.61**	.15	.29*	.44**	.09	.42**	.37**
4. Role consequences	.57**	.67**	.46**	—	.07	.14	.14	.27	.36*	.44**
Role ambiguity -Defense										
5. Scope of responsibilities	.61**	.61**	.48**	.42**	—	.82**	.74**	.67**	.17	.19
6. Role behavior	.60**	.75**	.56**	.42**	.74**	—	.83**	.65**	.15	.16
7. Role evaluation	.57**	.71**	.77**	.40**	.66**	.82**	—	.56**	.17	.22
8. Role consequences	.43**	.62**	.36**	.60**	.65**	.63**	.57**	—	.07	.12
A-State										
9. Cognitive	.39**	.20	.30*	.25	.20	.12	.17	.15	—	.58**
10. Somatic	.17	.11	.05	.18	.08	.16	.12	.15	.67**	—

Note: Correlations for male ( $n = 48$ ) and female ( $n = 66$ ) samples are presented above and below the diagonal, respectively. \* $p < .05$ ; \*\* $p < .01$

testing" (Tabachnick & Fidell, 1996, p. 156). Therefore we used a stepwise method of regression.

Assessment of both the variance inflation factors (VIF) and the tolerance statistics (Hair, Anderson, Tatham, & Black, 1998) revealed that multicollinearity was not at a level to evoke concern. That is, collinearity did not explain more than 10% of the variance in any independent variable.

For the overall sample, ambiguity concerning scope of offensive responsibilities was the only significant predictor of cognitive A-state, accounting for 19% of the variance,  $F(1, 109) = 25.52, p < .001$ . In order to conserve degrees of freedom (Cohen, 1988), only those role ambiguity dimensions that were correlated with cognitive anxiety were entered into the stepwise regression equations for the separate analyses by gender. Ambiguity concerning scope of offensive responsibilities was also predictive of cognitive anxiety in both sexes, accounting for 19% of the variance in the boys,  $F(1, 46) = 11.00, p < .01$ , and 15% of the variance in the girls,  $F(1, 61) = 11.12, p < .01$ .

### *Relationships Between Role Ambiguity and Somatic State Anxiety*

An identical stepwise regression analysis protocol was used to test the role ambiguity/somatic anxiety relationship. Contrary to our hypothesis, for the overall sample, ambiguity related to role consequences accounted for 9% of the variance in somatic anxiety,  $F(1, 109) = 10.77, p < .01$ . Further analyses of the separate male and female samples revealed that offensive role-consequences ambiguity accounted for 19% of the variance in somatic anxiety,  $F(1, 46) = 10.73, p < .01$ , in the boys. However, as no ambiguity dimensions were correlated with somatic anxiety for girls, no regression model was examined.

The inconsistent results across genders raises the issue as to whether gender may be a moderator of the relationship between role-consequences ambiguity and somatic state anxiety. To investigate this possibility, we carried out a test of moderation (Baron & Kenny, 1986). Baron and Kenny (1986) indicate that moderation occurs when the extent of the relationship between the independent variable and dependent variable is affected by a third variable. In the present case, this general scenario takes the form of gender acting to affect the relationship between offensive role-consequences ambiguity and somatic state anxiety. In statistical terms, the effect of gender on the offensive role-consequences ambiguity/somatic state anxiety relationship is determined by examining the effect of the interaction term, consisting of the moderator variable (gender)  $\times$  independent variable (offensive role-consequences ambiguity), on the dependent variable (somatic state anxiety). The main effects associated with gender and offensive role-consequences ambiguity may or may not be significant. However, if the interaction term is significant, there is evidence supporting moderation.

Consistent with procedures outlined by Baron and Kenny (1986), in order to test for moderation in a case where the dependent and independent variables are both continuous variables and the moderator is a categorical variable, we computed a general linear model with somatic anxiety as the dependent variable, gender as a fixed factor, offensive role-consequences ambiguity as a covariate, and a gender  $\times$  offensive role-consequences ambiguity interaction term. Results revealed a significant main effect for offensive role-consequences ambiguity,  $F(1, 107) =$

8.66,  $p < .01$ , but no main effect for gender,  $p > .10$ . The gender  $\times$  offensive role-consequences ambiguity interaction was also not significant,  $p > .10$ , thus yielding no evidence of moderation.

## Discussion

The purpose of this study was to examine the relationship between role ambiguity and precompetition A-state. Consistent with theory (cf. Kahn et al., 1964) and previous research from the sport domain (Beauchamp et al., 2002; Eys & Carron, 2001), role ambiguity was operationalized as a multidimensional construct (i.e., scope of responsibilities, role behaviors, role evaluation, and role consequences) manifested in each of two contexts, offense and defense. Our results showed three main findings. First, role ambiguity associated with scope of responsibilities on offense was positively related to precompetition cognitive anxiety for both sexes. Second, role ambiguity associated with role consequences on offense was positively related to precompetition somatic anxiety for boys, but not for girls. Finally, role ambiguity on defense was unrelated to either precompetition cognitive anxiety or precompetition somatic anxiety in either sex.

Considered in general, our results support the suggestion of Martens, Vealey, and Burton (1990) that “the primary means for reducing uncertainty is to *obtain information* that, if appropriate, converts uncertainty to certainty” (p. 220). Athletes who reported having clearer information about their offensive role responsibilities (i.e., lower role ambiguity) reported lower levels of anxiety prior to performing these responsibilities in competition. Conversely, the more unclear (i.e., higher role ambiguity) athletes were about their formal offensive role responsibilities, the higher their reported levels of A-state prior to competition.

The role ambiguity/*cognitive* anxiety relationship was consistent with our hypothesis. Ambiguity concerning the scope of one’s *offensive* responsibilities was the primary predictor of precompetition cognitive anxiety, accounting for 19% of the variance in boys and 15% of the variance in girls. Why was ambiguity related to scope of offensive responsibilities the only significant predictor of precompetition cognitive A-state? To shed light on this question, we conducted a post hoc analysis on supplemental data collected in the sample demographics section of our questionnaire that pertained to practice time emphasis and role responsibilities. Specifically, athletes reported that from the perspective of their overall role, offensive role responsibilities (52%) had slightly greater emphasis than defensive role responsibilities (48%). They also reported spending significantly, Wilks’ lambda = .89,  $F(1, 105) = 12.40$ ,  $p < .01$ , more time each week practicing their offensive than their defensive responsibilities ( $M = 127.78$  vs.  $97.82$  min, respectively). This was true for boys (offense:  $M = 105.76$  min; defense:  $M = 79.02$  min) as well as girls (offense:  $M = 145.67$  min; defense:  $M = 111.33$  min), both  $p < .05$ .

The fact that coaches spend significantly more time coaching offensive components of play compared to defensive components would suggest that coaches, either explicitly or implicitly, place more emphasis on offensive play or that offensive execution is inherently more complex and therefore requires greater attention. Whatever the reason, the emphasis on offense may place greater pressure on athletes and/or more uncertainty about their ability to carry out important team responsibilities. Thus, if players are spending much of the precompetition period ruminating over their various offensive role responsibilities and are unclear about

the breadth of those responsibilities, it is likely that uncertainty will ensue and cognitive A-state will follow.

Drawing from the current level of theory and research, a general role ambiguity/cognitive A-state relationship was hypothesized. However, it is clear from our findings that ambiguity concerning the scope of one's responsibilities is the most salient role-ambiguity dimension in relation to cognitive A-state. Recent research has also found that ambiguity concerning the scope of one's responsibilities was the prominent ambiguity dimension relating to task cohesion (Eys & Carron, 2001), role efficacy, and performance (Beauchamp et al., 2002). Taken together, results indicate that this specific manifestation of ambiguity is highly relevant to performance-related cognitions in sport. As a consequence, coaches should ensure that players clearly understand their various role responsibilities.

The significant role ambiguity/*somatic* anxiety relationship was not consistent with our hypothesis. However, this relationship might be explained in light of Borkovec's (1976) proposal that "as cognitive events of an anxiety-eliciting nature continue to occur, physiological arousal may be maintained at high levels" (p. 270). Borkovec suggested that the presence of external cues (e.g., an impending competition) allied with the expectations related to those cues may induce a somatic response. Consistent with this theorizing, it is possible that the sustained presence of ambiguity about potential consequences of not fulfilling one's offensive responsibilities in turn elicits a somatic response.

A possible explanation for why offensive role-consequences ambiguity was the principal predictor of somatic A-state relates to the fact that the consequences of failing to perform effectively are likely to become highly visible in the competitive arena. Thus, if a role incumbent is uncertain about the impact of his/her performance on the effective functioning of the team in competition, the expectation of possible failure may drive an elevated physiological response (i.e., somatic A-state).

Analyses also revealed that the significant offensive role-consequences ambiguity/*somatic* A-state relationship observed for the whole sample was reflective of a significant result for boys but not for girls. While these results pointed to the possibility that gender is a moderator of the offensive role-consequences ambiguity/*somatic* A-state relationship, a test of moderation (Baron & Kenny, 1986) revealed this was not the case. However, given the relatively small sample size and difficulty of detecting interactions in field research (McClelland & Judd, 1993), these results should not be considered conclusive. Based on the current results, gender is not a significant factor affecting the offensive role-consequences ambiguity/*somatic* A-state relationship. Further research on the interrelationships among multidimensional state anxiety and multidimensional role ambiguity among both sexes is clearly needed.

Although the results of the present study provide evidence for a positive relationship between role ambiguity and competitive A-state, a number of limitations should be noted. First, the homogenous nature of the sample (i.e., secondary school field hockey players) means that caution must be exercised before generalizing the results to other populations such as university or professional teams. Future research might examine the relationship between role ambiguity and athletes' affective states within teams from a variety of sports and competitive levels. Second, recent research by Jones and colleagues (Jones & Hanton, 1996; Jones, Hanton, & Swain, 1994; Jones & Swain, 1992; Swain & Jones, 1993) offers support for the suggestion that although scores on the CSAI-2 reflect the *intensity* of

anxiety symptoms, they provide no insight into how athletes interpret those symptoms. Their theorizing prompted Jones and Swain (1992) to modify the CSAI-2 to add a *direction* scale that attempts to determine whether athletes interpret A-state symptoms as being either facilitative or debilitating to performance.

While evidence was obtained in this study for a positive relationship between role ambiguity and the intensity of anxiety symptoms that athletes experience, the way in which athletes interpret these symptoms is not known. In the future, researchers are encouraged to assess the relationship between role ambiguity and the perceived direction associated with anxiety symptoms.

Despite these limitations, the study does make a number of important contributions to theory advancement and research. First, the results provide compelling evidence for a relationship between role ambiguity and competitive state anxiety. Within the conceptual framework of multidimensional anxiety theory, Martens, Vealey, and Burton (1990) proposed that an important means of reducing state anxiety is to provide athletes with the information they need to convert uncertainty to certainty. Although Martens et al. were not directly referring to information related to role responsibilities, it seems apparent that when athletes have clear information about their roles (i.e., lower role ambiguity), they also have lower levels of A-state prior to competition. Thus, the results support their theorizing.

The results of the present study would also appear to reinforce the value of examining psychological constructs in specific contexts. In this study we examined role ambiguity in the major behavioral contexts of offense and defense. However, future research could also examine role ambiguity in relation to leadership or informal role responsibilities. By differentiating between offense and defense in our study, we were able to determine that ambiguity about role responsibilities in one context, offense, was associated with competitive state anxiety while ambiguity arising from responsibilities in another context, defense, was not.

In terms of application and intervention, the results of our study highlight the importance of measuring different manifestations of role ambiguity, rather than utilizing a global or omnibus measure. By knowing which *type* of ambiguity is associated with a particular outcome (e.g., scope of offensive responsibilities/cognitive A-state; offensive role consequences/somatic A-state), the researcher or practitioner should be better equipped to develop an intervention designed to attend to that specific outcome (King & King, 1990). As Van Sell, Brief, and Schuler (1981) noted, "it is reasonable to assume that each dimension, since it describes a rather different situation associated with (the conflict or) ambiguity, will have or require a rather different strategy for coping with or reducing it" (p. 64).

Although precompetitive worry may stem from a variety of sources, understanding one's offensive role responsibilities would seem to be a source that could be readily modifiable. Thus, if a group of rookie athletes on a team seem worried prior to competition, having a coach arrange for the whole team to discuss and clarify the members' different offensive role responsibilities during a midweek practice would, as an intervention, be consistent with empirical evidence. Such an approach could allay the fears of new players who might be uneasy about asking for clarification. Also, such an approach could foster a greater collective understanding of specific team systems. In terms of intervention, the results of our study also appear to lend weight to Prapavessis and Carron's (1996) reminder that, in addition to attending to personal factors, one should consider that group dynamics might also contribute to an athlete's psychological state.

The present study provided evidence for moderate positive relationships between two forms of offensive role-ambiguity and precompetitive A-state. However, role ambiguity may be related to other indices of affect as well. For example, although the relationship between role ambiguity and competitive anxiety is likely to have performance-related implications, role ambiguity may also have an impact on how satisfied individuals are with their role responsibilities and how committed they are to their team. Indeed, previous research from the organizational domain has found role ambiguity to be negatively related to job satisfaction (Babakus, Cravens, Johnston, & Moncrief, 1999; Rhoads, Singh, & Goodell, 1994) and organizational commitment (Agarwal & Ramaswami, 1993; Colarelli & Bishop, 1990; Mayer & Shoorman, 1998); however, role ambiguity was not operationalized multidimensionally in these studies. Future research is needed to examine multidimensional role ambiguity in relation to player satisfaction and team commitment.

In conclusion, the results of the present study indicate that ambiguity concerning the scope of one's offensive responsibilities is predictive of cognitive A-state, while ambiguity concerning the consequences of not carrying out offensive role responsibilities predicts somatic A-state. Future research might use a multidimensional approach to measuring role ambiguity, and should also examine role ambiguity within a variety of contexts including leadership and informal roles, as well as the differentiation used here concerning offense and defense.

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