

The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety

A study of young athletes

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Goal orientation theory and competence motivation theory were used to examine the relationships between young athletes' achievement goals and indices of somatic and cognitive trait sport competition anxiety. Included in these analyses were also the potential mediating and moderating role of the athletes' perceived competence in sport. We examined 136 young athletes aged 13 to 18 years involved in organized sport within a community in northern Norway. Whereas no association was found between an ego oriented achievement goal and indices of anxiety, multiple regression analyses revealed that both a high task goal orientation and high perceived sport competence predicted a reduced tendency to report cognitive anxiety when competing in sport. In addition, athletes who perceived their competence in sport as high were found to be less predisposed to experiencing somatic anxiety in the form of elevated physiological arousal when competing than those who doubt their competence. The results further showed that perceived competence did not mediate or moderate the relationships between achievement goal orientations and somatic and cognitive indices of trait sport competition anxiety. The findings suggest that being task oriented in sport as well as having a sense of being competent are important in order to prevent sport competitions giving rise to elevated cognitive anxiety in young athletes.

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Many youngsters chronically experience stress in the form of anxiety when taking part in competitions (1). Given that organized sports attract a lot of children and youth and the fact that the experience of stress has been shown to be associated with psychological dysfunction and sport dropout (2, 3), the experience of anxiety in sport should be regarded as troublesome. Thus, the examination of potential antecedents of anxiety in sports for children and youth seems valuable in order to promote strategies that may alleviate stress among young people in sport. The main aim of the current study was to identify potential antecedents of sport competition anxiety among young people involved in organized competitive sports, utilizing current theoretical perspectives on precursors of stress and anxiety.

Sport competition anxiety and achievement goals

Previously, sport competition anxiety has been operationalized as a unidimensional construct, usually by means of Martens' (7) Sport Competition Anxiety Test (SCAT). Recent anxiety literature in sport psychology, however, has focused on the multidimensional nature of anxiety (4, 8, 9), suggesting that anxiety in sport consists of relatively independent somatic and cognitive components. Whereas the somatic aspects of anxiety are seen as comprising the autonomic arousal with its physiological responses such as sweating and increased heart rate, cognitive anxiety encompasses worries or concerns about potential failure and the adequacy of one's performance as well as disrupted attention and negative expectations (10). An important distinction between the two forms is

that with respect to somatic anxiety, increased autonomic arousal may, in some athletes, be perceived as increased readiness to compete and perform, thus not eliciting an anxiety response, whereas among others it may be interpreted negatively and trigger worry-like cognitions (19). This difference in individual perception and interpretation of arousal may thus attenuate associations between somatic aspects of anxiety and other cognitive variables such as achievement goals, perceived ability and enjoyment. In contrast, cognitive anxiety is by definition indicative of negative expectations and focused on negative thoughts in the form of worry. Consequently, it is important to identify the potential differential role of cognitive precursors of anxiety upon somatic versus cognitive aspects of anxiety as it may have different motivational consequences for the athletes.

According to achievement goal theory, individuals are focused on demonstrating ability and avoid demonstrating inability in achievement situations, and they attach different individual meaning to the concept of mastery and success (11, 12). A person who is primarily ego oriented is disposed to perceive a sense of mastery only in cases of demonstrating being more able than others, leading the person to a situation in which a sense of mastery and competence is, by definition, less under personal control. In particular, ego oriented athletes with low perceived competence should be vulnerable to experiencing that their self-worth comes under threat, in turn eliciting anxiety. By contrast, an athlete holding primarily a task oriented achievement goal is focused on task mastery and learning for purely intrinsic reasons and derives a sense of mastery based on personal progress, high effort and by learning something new. Consequently, by using self-referenced criteria, a sense of mastery and competence should, by definition, be regarded as more personally controllable and attainable for those who are task oriented. Accordingly, for task oriented athletes, the perceived uncertainty of achieving a particular outcome should also be reduced. Indeed, higher perceived uncertainty of outcome directly influences perceived psychological threat in the revised theory of competitive anxiety (4). Holding a task oriented achievement goal also implies that one is more intrinsically interested in the task at hand and in learning. As a consequence, whether one perceives oneself to be more or less able than others should add or detract little from one's sense of self-worth (14).

Based on achievement goal theory (13), supplemented by a control-process perspective on anxiety (15), a theory of self-worth (14) as well as cognitive evaluation theory (16), predictions about the relationships between different achievement goals and levels of anxiety can be made. First, individuals holding a task oriented achievement goal should be less vulner-

able to experiencing competitions as psychologically threatening, and thus cognitive anxiety provoking, because their possibility of achieving a sense of mastery should be both more readily attainable and more personally controllable. More specifically, Carver and Scheier (15) hold that athletes who have great confidence in their ability to control the environment (i.e., their performance) in order to achieve their goals will experience less anxiety. Moreover, less anxiety is also more likely among task oriented athletes because their self-worth should be less under threat due to a goal focus which is based on personal mastery and learning, rather than on demonstrating superior ability and on obtaining a favourable competitive outcome (14). Also, when being task oriented, failure is seen as a natural part of learning (17). Accordingly, worrying about making mistakes in competitions should be less likely among those who are task oriented. Those highly ego oriented, by contrast, would seem more susceptible to experiencing cognitive anxiety in competitions, given that they perceive their own success in sport to be dependent upon the performance of others (i.e., more uncontrollable factors such as others' ability and external factors). Moreover, athletes holding an ego oriented goal should be more apt to associate a lack of superior ability with reduced self-worth and view failure as indicative of low ability (13, 15–18). Thus, a high task orientation was expected to negatively predict cognitive anxiety, whereas a high ego orientation was expected to be positively predictive of cognitive anxiety.

Somatic indices of anxiety are usually operationalized as a sense of increased physiological arousal (4). As previously mentioned, such arousal is not necessarily indicative of elevated anxiety in the negative and true sense of the word. Instead it is the athletes' cognitive interpretation of the arousal or activation which will determine whether the physiological reactions are experienced as anxiety. As Hall and Kerr (19) state: "... somatic anxiety (as defined by elevated pulse, sweating etc.) may well be experienced whether athletes are predisposed toward either a task or ego orientation. Irrespective of the athlete's predispositional goal, the situation has the potential to elicit physiological responses which may indicate perceived readiness to perform in some athletes, or it may indicate an anxiety response" (p. 28). Accordingly, symptoms of physiological arousal (i.e., somatic anxiety) may be cognitively appraised quite differently among task oriented versus ego oriented athletes. Among those who are task oriented, competitive situations may not necessarily give rise to elevated pulse and/or other signs of arousal. Should task oriented athletes report indices of somatic anxiety such as, for example, that their heart beats faster than usual, this may well happen because arousal for them may reflect increased psychological

readiness and positive expectations when competing rather than signaling somatic anxiety in the negative and true sense of the word in being bodily reflections of negative emotions and thoughts. Consequently, no particular association between a task oriented achievement goal and somatic anxiety should be expected. By contrast, highly ego oriented athletes should be expected to report indications of not only cognitive anxiety but also somatic anxiety because for these athletes, the physiological symptoms in the form of elevated pulse and so on is likely to parallel and follow from their increased cognitive anxiety (i.e. worrying).

Anxiety may negatively influence attentional focus, thus reducing learning possibilities in sport (23). Further, being predisposed to react with increased anxiousness in evaluative situations may reduce motivation and facilitate dropout from sport among young athletes (2, 3). Based on these arguments and the fact that trait sport anxiety is predictive of state anxiety in sport, it seems important to identify the antecedents of sport trait anxiety also among younger athletes. Thus, the present study extends previous research (i.e. 9, 19, 20) by examining achievement goals in relation to both somatic and cognitive aspects of sport competition trait anxiety among young athletes.

Perceived competence and sport competition anxiety

Individual perceptions of competence in achievement oriented areas feature as a significant precursor of achievement cognitions, affect and behaviour in several theoretical approaches to learning and motivation (i.e., 14, 24–26). Harter (24) argues that due to an innate motive for demonstrating competence, individuals will respond with increased levels of negative affect if their attempts at gaining competence are not being met. In a similar vein, self-determination theory posits that athletes' intrinsic motivation including positive affect is dependent on meeting their need for being effective in their interactions with the environment (26). To the extent that the social context undermines the need for competence, dissatisfaction will be manifested, including also negative emotion such as anxiety (24, 26). According to a cognitive-affective model of anxiety (27), perception of stress and heightened levels of experienced anxiety follow when the perceived demands of the situation exceeds the individual's perceived response capability.

Thus, according to these complementary views about the role of perceived competence, athletes perceiving their sport-specific competence as low, should be more likely to respond towards competitive situations with increased levels of symptoms of cognitive anxiety such as worry. In fact, Covington (14) argues that the concept of perceived competence is critical

with respect to understanding the antecedents of anxiety in achievement oriented situations. In the academic domain it has been found that a decrease in perceived ability is a precursor of anxiety (28, 29). A second purpose of the current study, therefore, was to examine the role of perceived competence upon somatic and cognitive indices of sport competition anxiety. In line with Hall and Kerr's (19) assumptions concerning achievement goals as antecedents of state anxiety in sport, it was hypothesized that perceived competence was negatively related to both somatic and cognitive indices of sport competition trait anxiety.

Achievement goals and sport competition anxiety: the mediating and moderating role of perceived competence

Given the hypothesized predictive value of perceived competence upon anxiety (i.e., 14, 24–27), the potential interplay of perceived competence and achievement goals on sport competition anxiety should also be important to identify. More specifically, the potential mediating effect of perceived competence in the relationship between achievement goals and indices of sport competition anxiety should be considered. For example, Duda (30) has argued that the assumed positive effect of holding a task oriented achievement goal upon reduced anxiety may be an indirect one. That is, a high task orientation may give rise to an increase in perceived competence, which in turn counteracts the experience of anxiety. Accordingly, the relationships between achievement goals and anxiety should be examined also controlling for the potential mediating effect of perceived competence in this relationship.

Dweck and Leggett (17) and Nicholls (31) have further argued that holding an ego oriented achievement goal may be particularly detrimental with respect to subsequent affect in achievement activities among those doubting their perceived ability. By contrast, irrespective of their perceived ability, those who are primarily task involved are supposed not to suffer from negative affective states when met with potentially psychologically demanding and stress-inducing situations. Thus, the current study also examined the interactive or moderating role of perceived competence both in the relationship first between an ego oriented achievement goal and reported symptoms of somatic and cognitive anxiety as well as in the relationship between a task oriented achievement goal and reported symptoms of cognitive anxiety. Perceived competence was hypothesized to moderate somatic and cognitive anxiety among the ego involved, whereas the task involved were assumed to react with less anxiety, independent of variations in perceived competence.

Method

Participants

A random sample consisting of 250 children and adolescents within a community in the northern part of Norway provided the data for the study. Of all of those sampled, 100% volunteered to participate in the study. For the purpose of the present study, the 136 athletes (girls, $N=74$ and boys, $N=62$) reporting to be currently involved in competitive sports, and having been so for at least the last two years, comprised the sample. These athletes ranged in age from 11 to 18 years ($M=13.8$ years, $SD=2.2$ years) and they were involved in either one or several organized sports, with a clear majority having soccer as their main sport activity.

Procedure

After informed consent had been obtained, the subjects were sent a mailed questionnaire dealing with several aspects of their organized sport experience as well as background information. Questionnaires were completed at home. The questionnaire was pilot tested on a different sample consisting of 20 children and adolescents within the same age range. The investigators were present when the pilot questionnaire was filled in, and no problems were encountered in understanding the nature of the questionnaire and completing the questionnaire.

Instrumentation

Somatic and cognitive trait anxiety in sport. Indices of somatic and cognitive trait anxiety in sport were measured based on items from the sport competition anxiety test (7). Originally, the SCAT inventory was not constructed to distinguish between somatic and cognitive indices of trait sport anxiety. However, even if Smith et al. (32) contend that SCAT is primarily a measure of somatic anxiety and not an adequate measure of the cognitive dimensions of sport-specific anxiety, Martens et al. (4) suggested that a modification of the SCAT to account for both cognitive and somatic indices of competitive A-trait may prove useful. As emphasized by Lewthwaite (33), the SCAT clearly includes a mixture of somatic and cognitive indices which may make it useful to modify by means of exploration of potential subdomains. According to Lewthwaite, the 10 total items of the SCAT seem to comprise 8 somatically oriented items and 2 cognitively oriented items (33). Accordingly, for the purpose of the current study, factor analysis of the SCAT was performed in order to empirically test whether a 2-factor multidimensionality within the SCAT instrument could be found. A principal component factor analysis of the 10 SCAT items revealed 2 factors with

an eigenvalue >1 , accounting altogether for 56% of variance. As hypothesized by Lewthwaite (33), the 8 somatically oriented factors loaded on factor 1, which was labeled SOMSCAT, with loadings ranging from 0.80 to 0.46. This factor accounted for 43.5% of the variance. All items had lower loadings than 0.30 on the factor other than the predicted one. Examples of the somatically oriented items are: "Just before competing I notice my heart beats faster than usual", "Before I compete I get a funny feeling in my stomach". The second factor, which was labeled COGSCAT, accounted for 13% of the variance and comprised the two hypothesized cognitively oriented items with loading ranging from 0.87 to 0.75. These two items were: "Before I compete I worry about not performing well" and "When I compete I worry about making mistakes". Responses to each item can range from 1="hardly ever" to 3="often". Sumscores of the items loading on each factor were created and used for further computations. The score indicating somatic competitive A-trait yielded a Cronbach's alpha of 0.80, whereas the second (2 items), measuring cognitive sport competition trait anxiety, obtained an intercorrelation of $=0.49$.

Achievement goals. To assess task and ego oriented achievement goals in the domain of sport, a Norwegian version of the Perception of Success Questionnaire (POSQ) (34) was used. When completing the questionnaire, the athletes were asked to think of when they felt most successful in their respective sports and respond to several items, reflecting task- and ego-referenced criteria, respectively. The Norwegian version of the questionnaire was developed by means of an extensive translation and backtranslation process. The results of the factor analysis and the psychometric properties of the Norwegian version of the POSQ tested on a sample of university athletes are reported elsewhere (34, 35). In that sample, the factor analysis of the Norwegian version revealed two clearly predominant and distinct sets of items conceptually consistent with the original American version of the POSQ scale and had acceptable internal consistency. In addition, a third factor consisting of two of the original task orientation items were also revealed. This factor, however, was not used for further computations due to low internal consistency (see Roberts and Ommundsen (34)).

In order to test the factorial validity of the POSQ scale on this younger sample, the 12 items comprising the POSQ were factor analysed by means of principal component factor analysis with varimax and oblique rotation. The factor correlation matrix revealed a factor correlation of -0.24 , stating the orthogonality of the two factors (36). Thus, the varimax solution was considered appropriate for further use. The varimax rotation revealed two distinct factors reflecting the task and ego orientation,

respectively, both with an eigenvalue >1. On the first factor, labeled TASK, all the original task oriented items loaded, with loading ranging from 0.78 to 0.44. On the second factor, labeled EGO, all the original ego oriented items loaded, with loadings ranging from 0.82 to 0.57. All items had lower loadings than 0.30 on the factor other than the predicted one. Factor 1 accounted for 38% of the variance, whereas the second factor accounted for 15% of the variance. All responses on the two achievement goal scales were recorded on a 5-point Likert-type scale (i.e., strongly disagree=1 and strongly agree=5). The regression method was used to estimate and retain factor scores to be used in further analysis. This method was deemed appropriate as it secures maximum orthogonality in the computation of the task and ego factor scores (36).

Perceived competence (PC). PC was assessed using the Athletic Competence subscale of the Self-Perception Profile for children (37). This scale assesses the degree to which individuals view themselves as competent in games and sport skills, and it consists of 6 items organized in a structured alternative response format. First, respondents are asked to choose which of two types of children/adolescents they most resemble (e.g., “Some kids do very well at all kinds of sports, but other kids don’t feel that they are very good when it comes to sports”, and then mark whether this statement is partially or wholly true for them. Scores for each item range from 1 (low PC) to 4 (high PC). The scale has been extensively tested for validity and reliability, and has been validated in several sport-specific studies (see Weiss and Ebbeck (38)). The Chronbach’s alpha of the PC scale in the present study was 0.66.

Data analysis

Descriptive statistics for dependent and independent variables were computed and a zero-order correlation analysis was carried out to examine relations between the variables in the study. Several regression analyses were then conducted to examine the predictive effects of achievement goals on somatic and cognitive

anxiety, taking into account also the potential mediating and moderating role of perceived competence in these relationships (39, 40).

Results

Descriptive statistics and correlations

Table 1 shows the correlations, means, and standard deviations for each of the variables.

As can be seen from Table 1, somatic and cognitive anxiety are significantly correlated. Moreover, a task oriented achievement goal is negatively related to cognitive anxiety and uncorrelated to somatic anxiety, whereas perceived competence is negatively related to both cognitive and somatic anxiety. No associations between an ego oriented achievement goal and somatic and cognitive anxiety were revealed.

Mediating role of perceived competence

In order to examine potential mediating effects of perceived competence, several hierarchical regression analyses were conducted. According to Barron and Kenny (39), a variable functions as a mediator when it meets the following conditions: (a) The independent variable (ego and task orientation) must affect the mediator variable (perceived competence); (b) the independent variable (ego and task orientation) must affect the dependent variable (somatic and cognitive anxiety) and (c) the mediator (perceived competence) must affect the dependent variable (somatic and cognitive anxiety). If these conditions hold, a mediating effect is indicated when the effect of the independent variable on the dependent variable is less when regressed with the mediator included than without the mediator included. According to Baron and Kenny (39), a significant reduction in the variance in the dependent variable accounted for by the independent variable, when the mediator is introduced in the equation, demonstrates that the mediator is indeed operative and potent.

Correlational results (Table 1) showed, however, that the above conditions were only partially met, both with respect to somatic anxiety and cognitive

Table 1. Descriptive statistics and correlations for the dependent and independent variables

Variables	SOMSCAT	COGSCAT	PC	TASK	EGO
1. SOMSCAT	–				
2. COGSCAT	0.44***	–			
3. PC	–0.29***	–0.21*	–		
4. TASK	–0.04	–0.24**	0.007	–	
5. EGO	0.08	–0.03	–0.09	0.000	–
M	11.7	3.6	14.4	17.9	15.4
SD	3.1	1.2	3.2	3.6	5.2

*** P<0.001; ** P<0.01; * P<0.05.

anxiety as dependent variables. With respect to the mediating role of PC in the relationship between ego orientation and somatic anxiety, as can be seen from Table 1, only condition c (perceived competence – somatic anxiety) was met ($r = -0.29, P < 0.001$), whereas neither SOMSCAT and ego orientation nor PC and ego orientation were significantly correlated. Thus, the mediating role of PC in the relationship between ego orientation and somatic anxiety is excluded. As also can be seen from Table 1, quite parallel findings were revealed, and thus the same conclusion can be made in the case of cognitive anxiety. With respect to the potential mediating role of PC in the hypothesized inverse relationship between a task orientation and cognitive anxiety, the criteria forwarded by Baron and Kenny were also only partially met. More specifically, whereas conditions b (task goal – cognitive anxiety) and c (perceived competence – cognitive anxiety) were met ($r = -0.24, P < 0.001$ and $r = -0.21, P < 0.05$, respectively), condition a (task goal – perceived competence) was not ($r = 0.007, P = n.s.$). Accordingly, the possibility of PC being a mediating factor in the relationship between a high task orientation and low cognitive anxiety is excluded as well. The results showing that PC and task orientation both correlated with cognitive anxiety, with no mediating effect of PC being revealed in this relationship, suggest that PC and task orientation influence cognitive anxiety in an additive manner. In order to pursue this suggestion, both PC and task orientation were entered simultaneously in a multiple regression analysis with cognitive anxiety as dependent variable. Included also was an examination of the total amount of variance in somatic anxiety accounted for by PC, as PC was shown to be the only significant correlate to somatic anxiety (see Table 1). The results of these analyses are shown in Table 2.

As can be seen from Table 2, a task orientation ($\beta = -0.22, P < 0.01$) and perceived competence ($\beta = -0.21, P < 0.01$) accounted altogether for 10% of the variance in cognitive anxiety, indicating that a high task orientation and high perceived competence both to some extent predict a reduced tendency to approach sport competitions with worry-like cognitions.

Table 2. Regression coefficients for equations predicting somatic and cognitive anxiety

Predictor	Somatic anxiety	Cognitive anxiety
Perceived competence	-0.28***	-0.21**
Task goal		-0.22**
Multiple R	0.29	0.31
R-squared	0.09	0.10

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Table 3. Regression coefficients for equations predicting somatic and cognitive anxiety

Predictor	Somatic anxiety	Cognitive anxiety
Ego goal	0.17	-0.05
Perceived competence	-0.28***	-0.21**
Ego goal × Perceived competence	-0.12	-0.004
Multiple R main effect set alone	0.28	0.21
R-squared main effect set alone	0.08	0.04
Multiple R total set	0.29	0.21
R-squared total set	0.08	0.04

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

Furthermore, athletes who perceive their competence in sport as high seem less predisposed to experiencing somatic anxiety in the form of elevated physiological arousal in competitive sport situations than those who doubt their competence (perceived competence, $\beta = -0.28, P < 0.001$). Whether one is task oriented or ego oriented does not seem to make any difference as far as the probability for reporting somatic anxiety is concerned (task goal, $\beta = 0.06, P = n.s.$ and ego goal, $\beta = -0.03, P = n.s.$).

Moderating role of perceived competence

In order to test the multiplicative assumption with respect to the role of a high ego orientation, a high task orientation and low perceived competence on increased levels of somatic and cognitive anxiety, several 3-step hierarchical multiple regression analyses were performed with somatic and cognitive anxiety as dependent variables. In statistical terms, a possible moderating role of perceived competence in the relationship between each of the two goal orientations and each of the two indices of anxiety is a question of interaction (39). Accordingly, the first two interaction terms were computed by multiplying the PC score with each of the goal orientation scores. Then these two interaction terms were added to the regression equations in a third step, after entering goal orientations in step 1, and perceived competence in step 2. For interaction effects to be present, each interaction term should contribute with a significant amount of additional variance in anxiety, beyond that accounted for by the main effects alone (i.e., perceived competence and ego and task orientation) (40). The results of these analyses are shown in Tables 3 and 4.

As shown in Table 3, when somatic anxiety was regressed on ego goal and perceived competence, this main effect set (i.e., ego orientation and PC) accounted for 8% of the variance in somatic anxiety, and as also previously shown (Table 2), only perceived competence significantly, albeit modestly, predicted somatic anxiety. Inspection of the interaction set revealed that no significant additional variance in

Table 4. Regression coefficients for equations predicting cognitive anxiety

Predictor	Cognitive anxiety
Task goal	-0.24***
Perceived competence	-0.20**
Task goal×Perceived competence	0.006
Multiple R main effect set alone	0.31
R-squared main effect set alone	0.10
Multiple R total set	0.32
R-squared total set	0.10

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

somatic anxiety was accounted for by the ego orientation×PC interaction term (ego orientation×PC beta=-0.12, $P=n.s.$). A quite similar pattern of results was obtained when cognitive anxiety was regressed on the same variable set, showing that while PC was predictive of cognitive anxiety, no additional variance in cognitive anxiety was accounted for by the ego orientation×PC interaction term (ego orientation×PC beta=-0.004, $P=n.s.$).

As shown in Table 4, when cognitive anxiety was regressed on task goal, perceived competence and the interaction term of task goal×PC, no significant additional variance in cognitive anxiety was accounted for by the task orientation×PC interaction term (task orientation×PC beta=0.006, $P=n.s.$) not already accounted for by the main effect set ($R^2=0.10$).

Clearly, then, the results suggest that perceived competence has no moderating or interactive effect on the relationship between a high ego orientation and somatic and cognitive anxiety. Put differently, ego oriented athletes with a low score on perceived competence seem no more susceptible to experience indices of somatic and cognitive anxiety than are ego oriented athletes perceiving their sport competence as high. Furthermore, the relationship between a high task orientation and low cognitive sport trait anxiety do not seem to be moderated by variations in perceived competence.

Discussion

The current study sought to investigate the influence of motivational achievement goals and perceived sport competence on somatic and cognitive indices of sport competition trait anxiety in young athletes. Based on theoretical reasoning within an achievement goal approach to motivation (13, 30), as well as a control-process perspective on anxiety (15) and a theory of self-worth (14), we expected that a high ego orientation would predict elevated levels of reported somatic and cognitive sport trait anxiety, whereas a high task orientation was hypothesized to be associated with reduced levels of cognitive anxiety while

being unrelated to somatic anxiety. The findings partially support these hypotheses. As predicted, a high task orientation was shown to be a predictor of low levels of cognitive anxiety. Although this relationship was not a strong one, the result indirectly supports previous research (i.e., Vealey and Campbell (22), Hall and Kerr (19) and Newton and Duda (21)), showing that state competition anxiety was negatively related to task orientation in groups of adolescent skaters, young fencers and bowlers, respectively. The result also concurs with findings from studies in which antecedents of trait sport competition anxiety among skiers have been examined (i.e., 41).

Thus, it appears that young athletes who make use of self-referenced and more personally controllable criteria for defining mastery and success in sport (13, 15) are to some extent less disposed to experiencing competitions as psychologically threatening. This seems to be the case also when variations in ego orientation were statistically controlled for. Even though the strength of the results is not impressive, they are at least encouraging. A high task orientation may outweigh potential tendencies to experience anxiety in competitions and make young athletes resilient to stress experiences, despite a high ego orientation (42, 43). Given the correspondence between trait sport anxiety and state sport anxiety found in previous research (7), the finding has important practical implications for achieving appropriate preperformance states, such as reduced state competition anxiety. The result adds some weight to the argument that it may be valuable to have goal setting strategies which focus on setting goals that are perceived as attainable and within the young athletes' personal control. In particular, young athletes should be taught to value effort and progress while competing. By inducing a task oriented motivational climate among young athletes, their achievement goal may change (44), and less performance worry may be experienced (45).

The result that a high task orientation acts as a buffer against worry-like cognitions, also when variations in perceived competence were statistically controlled for, is encouraging as well. This finding adds some weight to Dweck and Leggett's (17) and Nicholls' (13, 31) proposal that a task oriented goal, irrespective of variations in perceived competence, may make athletes resilient to developing negative affective states. Thus, the finding suggests that low perceived competence does not induce a perception of psychological threat in competitions as long as the athletes' goal involves acquisition of ability rather than a display of ability. Instead, high perceived competence supplemented a high task orientation in the prediction of low cognitive anxiety. Thus, perceiving oneself to be competent in sport while simultaneously emphasizing progress and effort as criteria for defin-

ing mastery seems particularly beneficial in terms of not perceiving competitions as psychological threatening.

A high task orientation was unrelated to somatic anxiety operationalized as self-reported signs of elevated physiological arousal. This was what we expected. This finding indicates that being task oriented does not rule out the possibility of reporting indications of elevated physiological arousal. This result is in line with previous findings (i.e., 19), suggesting that being task oriented does not rule out the possibility of reporting signs of somatic anxiety in the form of elevated physiological arousal. This finding to some extent supports previous evidence and reasoning arguing that task oriented athletes may not necessarily be prevented from reporting physiological symptoms of somatic anxiety because they, as opposed to those who are ego oriented, possibly interpret bodily symptoms of elevated activation such as becoming anxious or elevated pulse positively as increased psychological readiness. Indeed, others (i.e., 46) have argued that somatic and cognitive anxiety have different antecedents, with cognitive anxiety being more closely related to evaluative aspects, such as expectations of success and performance worry. The difference in the relationships between a task orientation and somatic and cognitive anxiety adds some weight to the proposed value of taking a multidimensional approach when studying anxiety in the context of competitive sport for young athletes (4, 46).

Neither somatic nor cognitive indices of sport competition trait anxiety were predicted by a high ego orientation in these young athletes. These results run counter to previous research (19, 20) and theoretical reasoning stating that athletes should be more likely to encounter anxiety if they perceive sport success to be a function of normative criteria or to be dependent upon less controllable factors such as others' ability and/or external factors (13, 47). It has, however, been argued that affective experiences among ego oriented athletes will vary, dependent upon their perceptions of ability (13, 17, 48). That is, concern with one's ability relative to others combined with doubts about the adequacy of one's own ability should create a particular vulnerability as far as negative affect is concerned. Thus, the ego involved who simultaneously perceive their competence to be low, seem to be particularly vulnerable to experience increased levels of anxiety (19). However, additional analyses, in which the potential interactive effect of different levels of perceived competence and a high ego orientation on anxiety were examined, revealed no interactive/moderating effects of perceived competence.

Task and ego orientation were found to be orthogonal in the current study. Several researchers have argued that in cases of orthogonality it is necessary to

divide groups into different combinations of ego and task orientation (i.e., 49) before examining correlates of achievement goals. Even though such an approach has been questioned on statistical grounds (50), for exploratory purposes, the athletes included in the current study were divided into four groups based on median splits on task and ego orientation and were then tested with respect to potential mean differences in anxiety scores based on a one-way analyses of variance. No significant differences on indices of anxiety between the four subgroups of athletes (i.e., task/ego=hi/hi, hi/lo, lo/hi and lo/lo, respectively) were found.

Having ruled out these possible explanations by means of additional analyses, we can only speculate as to why an ego orientation was not predictive of increased cognitive and somatic anxiety. In the present study, the athletes were higher in task orientation than in ego orientation. Accordingly, a task goal rather than an ego goal may have been a more salient construct when the athletes were evaluating their anxiety levels, thus attenuating associations between an ego oriented goal and indices of anxiety.

Another possibility may be that the ego oriented athletes in this study mainly represent what Skaalvik (51) has labeled a self-enhancing ego orientation as opposed to a self-defeating ego orientation. Whereas the goal of self-enhancing ego oriented individuals is to demonstrate superior abilities, those with a strong self-defeating ego orientation are seen as being preoccupied with concealing lack of ability and avoiding being negatively judged by others ("at school it is important for me to avoid looking stupid"). Traditionally, whereas in fact both self-enhancing as well as aspects of self-defeating ego orientation have been included in the concept of ego orientation at a theoretical level (i.e., 13), ego orientation has for some reason been empirically investigated operationalized mainly as reflecting a self-enhancing ego orientation (i.e., 13, 52). This was also the case within the current study (i.e. "I feel successful in sport when I do better than other athletes"). Interestingly, Skaalvik in a study among 6th and 8th grade Norwegian students found that self-defeating ego orientation (i.e. being concerned with not looking stupid and with what others think about one's performance) was predictive of increased levels of school subject-specific trait anxiety, whereas a self-enhancing ego orientation (i.e. being focused on doing better than others) was not (51). Accordingly, one could speculate that the lack of negative relation between a high ego orientation and indices of anxiety in the current study reflects the fact that these athletes are high in self-enhancing ego orientation. This aspect deserves further attention in future research. In particular, future studies may take advantage of examining both self-enhancing as well as self-defeating dimensions of an ego goal as poten-

tially differential antecedents of negative affect in sport.

Yet another reason for the insignificant relationship between a high ego orientation and elevated cognitive and somatic anxiety may be that the athletes involved in the current study perceive the motivational climate in their respective sports to be primarily mastery or task oriented. If so, more uncontrollable, social comparison oriented criteria for defining success may not have been emphasized within the situational competitive sport context in which the athletes operate. Indeed, previous research has revealed that the perception of the motivational climate as mastery/task oriented influences affective experiences (35, 48, 53). The perception of the motivational climate may even outweigh or override the effects of ego oriented dispositional goal orientations in terms of negative affect (54). If so, high ego oriented athletes may be no more apt than those who are task involved to react toward competitions with signs of somatic and cognitive anxiety. In forthcoming studies, the interactive effects of dispositional goal orientations and motivational climate on somatic and cognitive competitive anxiety in youth sport should be examined.

It was hypothesized that perceived competence would be negatively related to somatic and cognitive anxiety. The correlational results clearly supported this hypothesis. Moreover, the regression analyses showed that high perceived competence buffers against cognitive anxiety above the anxiety reducing effect of being disposed towards a task oriented achievement goal. According to a cognitive-affective model of stress and anxiety (27), heightened levels of stress and anxiety result when individuals do not view their response capabilities as adequate to meet the demands of the situation. Supporting this view, it seems that young athletes with low perceived competence worry more about making mistakes and report elevated levels of physiological symptoms of stress than their counterparts. Thus, in order to reduce the tendency among athletes to experience competitions as psychologically threatening, effort should be put into raising young athletes' ability perceptions. Since task oriented individuals tend to construe competence based on self-referenced criteria and they are primarily concerned with task mastery, they should be more likely to develop perceived competence over time (17). Thus, even though a task orientation was uncorrelated with perceived competence in the current study, it nevertheless seems valuable to work towards installing self-referenced criteria for defining competence among young athletes. An additional strategy would be to convince young athletes that ability is an acquirable skill. In support for this, it has been found that performing a motor task under the conception that ability is a fixed trait resulted in less

increment in perceived self-efficacy and also more negative self-reactions than under a condition in which ability was seen as an acquirable skill (55). In particular, it seems valuable to raise competence perceptions in the initial phases of acquiring new athletic skills both by encouraging a task orientation (56) as well as giving instructions that make the learner focus on process goals such as fundamental aspects of the movements required for a good performance execution (57).

This study has several limitations. First, the variance accounted for by the independent variables is rather modest. Second, the data are correlational, thus conclusions concerning causal relations cannot be drawn. Third, the scales used to measure somatic and cognitive aspects of sport competition trait anxiety were exploratory, originally not intended to differentiate between those two aspects of anxiety. Even though the factor structure of the scale supported our modified use, future studies should take advantage of scales developed specifically for the measurement of different aspects of sport anxiety.

In conclusion, several findings support, albeit modestly, the view that an examination of potential antecedents of sport competition trait anxiety may take advantage of using an achievement goal approach and competence motivation theory when examining potential antecedents of sport competition trait anxiety. Using multidimensional approaches to anxiety also seems promising in this respect. The assumption that young athletes would show decreased levels of cognitive sport competition trait anxiety, but not of somatic sport competition trait anxiety if they were task oriented was supported. Moreover, a high task orientation related to less self-reported cognitive anxiety, irrespective of variations in the athletes' perceived competence and low perceived competence, negatively predicted both increased somatic and cognitive anxiety. Thus, it appears that both theories dealing with athletes' beliefs about the extent of their ability and theories dealing with the way they construe this ability may represent a base for intervention work aimed at making competitions less anxiety provoking for young athletes.

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