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Please note James Adie was working at the University of Birmingham at the time of publication.

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# Achievement Goals, Competition Appraisals, and the Psychological and Emotional Welfare of Sport Participants

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Grounded in the  $2 \times 2$  achievement goal framework (Elliot & McGregor, 2001), a model was tested examining the hypothesized relationships between approach and avoidance (mastery and performance) goals, challenge and threat appraisals of sport competition, and positive and negative indices of well-being (i.e., self-esteem, positive, and negative affect). A further aim was to determine the degree to which the cognitive appraisals mediated the relationship between the four achievement goals and the indicators of athletes' welfare. Finally, measurement and structural invariance was tested with respect to gender in the hypothesized model. An alternative model was also estimated specifying self-esteem as an antecedent of the four goals and cognitive appraisals. Four hundred and twenty-four team sport participants ( $M_{\text{age}} = 24.25$ ) responded to a multisection questionnaire. Structural equation modeling analyses provided support for the hypothesized model only. Challenge and threat appraisals partially mediated the relationships observed between mastery-based goals and the well-being indicators. Lastly, the hypothesized model was found to be invariant across gender.

**Keywords:** approach and avoidance goals, cognitive appraisals, well-being, structural equation modeling, mediation analyses, gender invariance

Engagement in sport programs is assumed to hold ramifications for participants' psychological and emotional well-being. Previous research in the sport domain has shown the benefits aligned with sport engagement to be partly a function of the motivational climates created by significant others (e.g., coaches; Reinboth & Duda, 2004). The literature also suggests that there are important individual differences in approaches to sport achievement that hold implications for whether athletic participation will lead to positive and/or negative health-related consequences (Duda, 2001). Grounded in a contemporary achievement goal framework (Elliot, 2005; Elliot & McGregor, 2001), this study investigated the relationships between approach and avoidance achievement goals, cognitive appraisals of sport competition, and indices of well-being among male and female sport participants.

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Achievement goals represent the perceptual lens individuals adopt to interpret the achievement context at hand (Kaplan & Maehr, 2007). In line with this conceptualization, researchers have traditionally assumed the salience of two achievement goals (Dweck, 1999; Nicholls, 1984). According to the dichotomous perspective, a task (or mastery) goal is defined in terms of self-referenced criteria, whereas an ego (or performance) goal corresponds to an emphasis on other-referenced standards of competence. A mastery goal is pursued with the intention of developing competence, experiencing personal improvement, and witnessing task mastery. The purpose of a performance goal is to demonstrate superior ability through performing better than others with equal effort, or performing equally to others with less effort. In the extensive literature grounded in the dichotomous model (Dweck, 1999; Nicholls, 1984), mastery/task goals have typically predicted adaptive achievement-related patterns (Duda, 2001; Ntoumanis & Biddle, 1999), whereas the findings concerning performance/ego goals have been equivocal (see Biddle, Wang, Kavussanu, & Spray, 2003).

With an emphasis on the ambiguous findings emanating from the conventional two-goal model (see Elliot, 1999; 2005), the approach–avoidance distinction was applied to the mastery–performance goal dichotomy to form initially the trichotomous framework (e.g., Elliot & Church, 1997) before the advancement of the  $2 \times 2$  achievement goal model (Elliot & McGregor, 2001). The latter framework has been argued to be the most parsimonious in the achievement goal literature (Moller & Elliot, 2006), and assumes that four achievement goals operate in achievement contexts (Elliot, 1999; 2005). The four goals are termed *mastery approach* (MAp; concerned with the attainment of self/task-referenced competence), *mastery avoidance* (MAv; striving to avoid self/task-referenced incompetence), *performance approach* (PAp; focused on attaining normative competence), and *performance avoidance* (PAv; centered on avoiding normative incompetence).

According to Elliot (2005), the adoption of MAp goals will lead to adaptive achievement-related processes and outcomes, whereas it is argued that the valence dimension of competence (i.e., the approach–avoidance distinction) accounts for observed differential achievement patterns of performance-based goals (Elliot, 1999). It has been suggested that MAv goal adoption would correspond to less adaptive responses than MAp goals, but be associated with less negative consequences than PAv goals (Elliot & Conroy, 2005).

The research in the physical domain stemming from the revised goal perspective has been primarily grounded in the trichotomous framework (MAp, PAp, and PAv goals; Elliot & Church, 1997). Studies conducted in sport and physical education (PE) settings have shown the three goals to be differentially related to intrinsic motivation (e.g., Cury, Elliot, Sarrazin, Da Fonseca, & Rufo, 2002), performance (e.g., Elliot, Cury, Fryer, & Huguet, 2006; Nien & Duda, 2007), and self-handicapping (Ommundsen, 2004). For example, Cury, Elliot, and colleagues (2002) randomly assigned French adolescent physical education students to one of three achievement goal-inducing conditions. The results indicated that individuals in the MAp and PAp goal conditions were comparable in levels of intrinsic motivation (operationalized in terms of free choice behavior on a basketball dribbling task), whereas intrinsic motivation was compromised for the participants in the PAv goal group. The observed effects were mediated by competence valuation, state anxiety, and task absorption processes. Utilizing a similar design, Elliot et al. (2006) found that

PE students in the M<sub>AP</sub> and P<sub>AP</sub> goal groups performed to a comparable level in a basketball dribbling task, whereas participants in the P<sub>AV</sub> goal condition performed considerably worse than participants in the other two conditions. Further analyses supported the mediational role of self-handicapping strategies in explaining the relationship from P<sub>AV</sub> goal adoption to basketball dribbling performance.

Sport research investigating the predictive utility of the 2 × 2 model, and in particular the role of the M<sub>AV</sub> goal, is still in its infancy (e.g., Nien & Duda, *in press*). To date in this work, the tenets of the revised goal theory concerning the M<sub>AV</sub> goal are not fully supported (Elliot & Conroy, 2005). The M<sub>AV</sub> goal has positively correlated with only maladaptive antecedents and consequences, which include fear of failure (Conroy, Elliot, & Hofer, 2003; Nien & Duda, *in press*), amotivation (Conroy, Kaye, & Coatsworth, 2006; Nien & Duda, *in press*), and negative reactions to imperfection (Stoeber, Stoll, Pescheck, & Otto, *in press*). For example, a recent study by Conroy et al. (2006) observed participants' situational motivation during a summer swim league. The findings showed that residual changes in M<sub>AV</sub> goal adoption were positively associated with increases in the amotivation of the participants over the season.

Duda (2001) has argued that beyond predicting motivation and achievement-related outcomes, variations in achievement goals also provide insight into variability in sport participants' psychological and emotional well-being. In the psychological literature, well-being is not simply defined as an absence of ill-health, but rather is held to represent the degree to which a person is witnessing psychological growth and functioning optimally in the context in question (see Ryan & Deci, 2001). Self-esteem, the extent to which a person feels positively about the self, is widely accepted as a key indicator of psychological well-being and adjustment to life demands (Fox, 2000). In addition to self-esteem, we also measured positive and negative affect (Watson, Clark, & Tellegen, 1988) as indicators of psychological and emotional well- and ill-being in the current study.

To date, the majority of sport research that has examined the relationship of achievement goals to indices of psychological/emotional functioning has done so using the dichotomous model (e.g., Kavussanu & Harnisch, 2000; Ntoumanis & Biddle, 1999). Kavussanu and Harnisch (2000) found that youth sport participants characterized by a high task orientation exhibited significantly higher self-esteem than participants low in a task orientation. Ntoumanis and Biddle (1999) conducted a meta-analysis of the links between task and ego goal orientations and emotion. The theoretical predictions concerning task orientation were supported. An ego orientation was positively and weakly associated with both positive and negative affect. Ntoumanis and Biddle (1999) suggested that the latter weak and seemingly conflicting findings for ego orientation could be potentially more robust and clearer if this goal was differentiated in terms of approach and avoidance motivation.

To our knowledge, the relevance of approach and avoidance (mastery/performance) goals to the prediction of dimensions of well-being in sport has not received empirical investigation. Preliminary research conducted in the academic domain found students who pursued avoidance (relative to approach) personal goals reported lower subjective well-being (indexed by positive affect, negative affect, and life satisfaction) over the course of a semester (e.g., Elliot, Sheldon, & Church, 1997). One limitation of this work was that the mastery/performance

components of avoidance (as well as approach) achievement goals were not considered. Grounded in the  $2 \times 2$  achievement goal framework (Elliot & McGregor, 2001), the current study examined the relationship of the four goals to indices of well-being among sport participants.

Little is known regarding the mechanisms by which achievement goal adoption may impact on the experience of well-being among sport participants. One potential process by which achievement goals might influence athletes' psychological and emotional welfare concerns variability in their cognitive appraisals of stressful events in the sport domain. According to Lazarus and Folkman (1984), there are individual differences in the tendency to cognitively appraise the demands presented in the objective environment as more or less challenging or threatening. Challenge appraisals correspond to perceiving the environmental demands as an opportunity for growth, mastery, or gain, whereas threat appraisals relate to the anticipation of the stressful event as being potentially harmful to one's sense of self. Based on the cognitive-mediational theory of stress (Lazarus & Folkman, 1984; Lazarus, 1999), it is assumed and empirically supported in sport settings that cognitive appraisals are relevant to personal well-being (e.g., Giacobbi, Tuccitto, & Frye, 2007; Ntoumanis & Biddle, 1998).

Research investigating the determinants of variability in cognitive appraisals of a stressful event has received less attention in the sport psychology literature. Roberts (1986) argued that individual differences in achievement goal emphases might explain variation in athletes' interpretation of stressful encounters. This hypothesis has only received empirical attention in sport research grounded in the dichotomous goal framework (e.g., Kim & Duda, 2007). No previous studies have examined the relevance of approach and avoidance achievement goals in predicting variation in cognitive appraisals among athletic participants.

This is not the case in the academic domain. McGregor and Elliot (2002) found students endorsing M<sub>Ap</sub> and P<sub>Ap</sub> goals to be more inclined to construe the anticipatory time to their exam as a challenge, whereas students pursuing P<sub>Av</sub> goals were prone to interpreting the exam as threatening. Two shortcomings concerning this study were that M<sub>Av</sub> goals were not investigated, and the implications of cognitive appraisals on individuals' reported well-being were not examined. In the current study, participants' tendencies to cognitively appraise a hypothetical sports competition as a challenge and/or threat were examined as predictors of indicators of athletes' welfare. Extending the work of McGregor and Elliot (2002), the current study examined whether competition appraisals mediated the hypothesized relationships of the four goals to indices of psychological and emotional welfare in regard to adult athletes.

In sum, the first aim of the study was to test a model describing a hypothesized sequence from approach and avoidance goals to cognitive appraisals and positive and negative indicators of well-being. Based on the tenets of the  $2 \times 2$  achievement goal framework and along with previous findings (Elliot, 2005; McGregor & Elliot, 2002), M<sub>Ap</sub> goals were hypothesized to positively predict challenge appraisals, and negatively predict threat appraisals. P<sub>Ap</sub> goals were expected to positively relate to both challenge and threat appraisals. This latter prediction stems from the assumption that the P<sub>Ap</sub> goal is held to be underpinned by both aversive (i.e., fear of failure) and positive (i.e., motive to achieve) antecedents (Elliot & Church,

1997). The positive and potential negative outcomes of PAP goals among athletes is also assumed to be a result of the objectively comparative nature of sport (Elliot & Conroy, 2005).

PAv goals were theorized to positively predict threat appraisals and to negatively link to challenge appraisals. Despite the limited research concerning a MAV goal, preliminary evidence has indicated that there are negative ramifications of adopting this goal in sport (Conroy et al., 2006; Nien & Duda, in press). Thus, we tentatively postulated that a MAV goal would negatively predict challenge appraisals and be positively associated with threat appraisals. Aligned with Lazarus's theory of stress (e.g., Lazarus, 1999) and previous empirical findings (e.g., Giacobbi et al., 2007), challenge appraisals were hypothesized to positively correspond with indices of well-being (i.e., self-esteem, positive affect), but be unrelated to negative affect (the targeted indicator of ill-being). Threat appraisals were posited to positively predict negative affect, be negatively related to self-esteem and not significantly linked to positive affect. Based on the theoretical tenets of the  $2 \times 2$  model (Elliot & McGregor, 2001), we hypothesized relationships among the four goals except the correlation between MAv and PAv.

The second aim was to discern the mediational role of cognitive appraisals of sports competition in explaining the theoretically predicted relationships between the four goals and indices of well-being. Mediation was tested via structural equation modeling (SEM) to control for measurement error (see Holmbeck, 1997).

Our third purpose was to test the degree to which the relationships estimated in the hypothesized model were equivalent for male and female athletes. Gender invariance of the hypothesized model was investigated based on the postulate that variation in achievement goal adoption is influenced by gender (Elliot, 1999). Previous work has revealed mean differences in the emphasis placed on approach and avoidance goals between males and females (e.g., McGregor & Elliot, 2002). Based on these mean differences, studies such as McGregor and Elliot (2002) have controlled for gender effects when examining the relationship of goals on various outcomes. Controlling for such variables does not provide insight as to whether the network of relationships emanating from Elliot and McGregor's (2001)  $2 \times 2$  goal framework hold across groups and contexts. To address this issue, researchers should conduct invariance testing.

Two studies have tested gender invariance of the  $2 \times 2$  model in the physical domain. Research by Wang, Biddle, and Elliot, (2007) supported the factorial invariance of the  $2 \times 2$  achievement goal questionnaire adapted for physical education in a sample of male and female Singaporean adolescents. Nien and Duda (in press) found evidence for partial invariance of a structural model capturing the theoretically assumed antecedents and consequences of the four goals among male and female sport participants. In the current study, we hypothesized that the processes by which the four goals differentially predict well-being would be comparative for males and female athletes.

The final purpose of the study was to examine an alternative model depicting a sequence of relationships from self-esteem to achievement goals to cognitive appraisals and ensuing well- and ill-being (see Figure 2). Elliot (1999) proposed that self-esteem, a personality variable, might be a determinant of goal adoption. Research in the education domain has supported this proposition by finding evidence to suggest self-esteem is a predictor, albeit weakly, of avoidance (relative

to approach) goal adoption (Heimpele, Elliot, & Wood, 2006). Past work has also supported the theoretical predictions implicating self-esteem as a source of individual differences in cognitive appraisals of a stressful encounter (e.g., Lazarus & Folkman, 1984; Major, Richards, Cooper, Cozzarelli, & Zubek, 1998). It is possible that self-esteem is viewed as a personality characteristic important to providing a resilience to interpreting a stressful event as a threat, and instead, contributes to a tendency to perceiving such an event as a challenge. Thus, we also estimated direct paths from self-esteem to challenge and threat appraisals. The objective behind examining the two competing models (i.e., the hypothesized and alternative) was to delineate which model was more representative of the data.

## Method

### Participants

Four hundred and twenty-four male and female participants ( $M = 235$ ;  $F = 189$ ;  $M_{\text{age}} = 24.25$ ;  $SD = 6.24$ ) from the West Midlands, U.K., volunteered for the study. The sample comprised participants from six team sports (cricket:  $n = 128$ ; hockey:  $n = 108$ ; netball:  $n = 83$ ; football:  $n = 43$ ; basketball:  $n = 40$ ; rugby:  $n = 22$ ). The participants competed predominantly at club level ( $n = 325$ ), with fewer participants competing at a higher level (county:  $n = 36$ ; regional:  $n = 39$ ; national:  $n = 19$ ; international:  $n = 4$ ; unreported:  $n = 1$ ). On average, study volunteers had 12 years of experience in their chosen sport and practiced for approximately seven hours per week.

### Design and Procedure

Ethical approval to conduct this study was granted by the investigators' University School ethics committee. Participants provided informed consent to volunteer for the study. A multisection questionnaire was then distributed either before or after training. When completing the questionnaire, participants were instructed that there were no right or wrong answers, and were asked to work independently, responding to all the questions as honestly as possible. Completion of the questionnaire took approximately 15 min.

### Measures

**Achievement Goals.** The Achievement Goal Questionnaire for Sport (AGQ-S; Conroy et al., 2003) was designed to measure the degree to which participants endorse different achievement goals in their chosen sport. The AGQ-S measures four goals, each with three items: Mastery approach (MAp; e.g., "It is important to me to play as well as I possibly can"), Mastery avoidance (MAv; e.g., "I worry that I may not play as well as I possibly can"), Performance approach (PAp; e.g., "It is important to me to do well compared to other players"), and Performance avoidance (PAv; e.g., "I just want to avoid playing worse than other players"). Participants responded on a 7-point scale ranging from *not at all like me* (1) to *completely like me* (7). The psychometric properties of the AGQ-S have been supported in previous sport and PE research (Conroy et al., 2003; Nien & Duda, in press).

**Cognitive Appraisals of Sport Competition.** Based on the challenge and threat construal measure (McGregor & Elliot, 2002), which taps students' appraisals before a classroom examination, a 10-item adapted version was employed to assess participants' dispositional appraisals of a hypothetical sport competition. Participants were asked to imagine an upcoming important competition against a tough opponent/team where the stakes had been evenly contested in the past (i.e., won once, beaten once). Definitions of appraisals were provided concerning how individuals might respond to such a situation. Next, participants were asked to recall when they had encountered similar circumstances in their sport and to respond to the stem "How would you typically think before such a competition?" A sample item for the challenge scale is "I view the [e.g., football] match as a positive challenge," and one from the threat scale is "I think the [e.g., football] match could be threatening to me." The challenge and threat construal measure has yielded high internal consistency and predictive validity in the classroom setting (McGregor & Elliot, 2002). All responses were indicated on a 7-point Likert scale ranging from *not at all true of me* (1) to *very true of me* (7).

**Self-Esteem.** The 8-item self-esteem subscale of the Physical Self-Description Questionnaire (PSDQ; Marsh, Richards, Johnson, Roche, & Tremayne, 1994) was employed to assess participants' level of self-esteem. Three items of the subscale are positively worded and five items are negatively so (e.g., "Overall, I have a lot to be proud of" and "I feel that my life is not very useful"). Participants responded on a 6-point Likert scale ranging from 1 = *false* to 6 = *true*. The psychometric properties of this scale have been supported in education (e.g., Marsh et al., 1994) and in the sport setting (e.g., Reinboth & Duda, 2004).

**Positive and Negative Affect.** Nine items were used to measure the frequency by which participants were experiencing positive and negative affect (Diener & Emmons, 1984) in a sport setting. The positive affect scale comprised four items (e.g., happy, pleased, joyful, enjoyment/fun), and the negative affect scale contained five items (e.g., unhappy, angry/hostile, frustrated, anxious, depressed). Participants responded to the stem "When playing my sport, I feel . . ." and indicated their answers on a Likert scale of 1 = *not very often* to 7 = *all the time*. The internal reliability of this measure has been supported in previous sport research (e.g., Ebbeck & Weiss, 1998).

## Results

### Factorial Structure of the Scales

Before testing the structural component of the hypothesized model, we examined the factorial structure of each scale. The robust maximum likelihood method provided by EQS 6.1 (Bentler & Wu, 2002) was used to analyze the data. Because the robust  $\chi^2$  statistic (Satorra & Bentler, 1988) is widely known to be sensitive to sample size, we also evaluated model fit using the robust comparative fit index (R-CFI), the standardized root mean square residual (SRMR) and the robust root mean square error of approximation (R-RMSEA) with its 90% confidence interval (90% CI). According to Hu and Bentler (1999), a good model fit is indicated by



a CFI value close to or above .95, and when the SRMR and RMSEA values are ideally below .08 and .06, respectively.

Confirmatory factor analyses (CFA) indicated that the scales tapping the following constructs should be revised: threat appraisals, scaled  $\chi^2 = 54.15$  (5),  $p < .001$ ; R-CFI = .92; SRMR = .06; R-RMSEA = .15 (90% CI = .12–.19); self-esteem, scaled  $\chi^2 = 191.50$  (20),  $p < .001$ ; R-CFI = .73; SRMR = .12; R-RMSEA = .14 (90% CI = .12–.16); and negative affect, scaled  $\chi^2 = 44.67$  (5),  $p < .001$ ; R-CFI = .90; SRMR = .06; R-RMSEA = .14 (90% CI = .10–.18). Based on inspection of the standardized residual matrix and the modification indices, problematic items were removed one at a time and the three separate factor models were reevaluated in each instance. Hofmann (1995) proposed this stepwise technique as it maintains the factorial structure of a scale while retaining only the best available indicators. The five items omitted were a threat appraisal item (e.g., “I believe the [football] match could have negative outcomes for me”), one negative affect item (“frustrated/annoyed”), and three items from the self-esteem scale (“Overall, I have a lot to be proud of,” “Most things I do, I do well,” and “Overall, most things I do turn out well”). It is important to note that the removal of these items from each scale can also be supported from a conceptual standpoint. For example, the removed threat appraisal item captures the potential aversive consequences that participants might expect as a result of participating in a sport competition (e.g., tiredness) as opposed to appraising the competition as a threat per se. The omitted items of the self-esteem scale might have been construed by participants as being achievement-related, and not measuring overall feelings of self-worth. Following these revisions, the three modified scales along with the other scales used in the study provided acceptable fit indices (see Table 1). The factor loadings associated with the revised and full scales were all significant and satisfactory (median factor loading = .76). These results are available on request from the first author. After dropping the problematic items, the full measurement model was tested and reported adequate fit indices:

**Table 1 Goodness of Fit Indices of the Latent Factors**

Latent factor	Scaled $\chi^2$	df	R-CFI	SRMR	R-RMSEA (CI)
Mastery approach	1.58	1	1.00	.06	.04 (.00–.14)
Mastery avoidance	.86	1	1.00	.02	.00 (.00–.13)
Performance approach	4.52*	1	.99	.04	.09 (.02–.18)
Performance avoidance	3.21	1	1.00	.02	.07 (.00–.17)
Challenge appraisals	8.70	5	.99	.03	.04 (.00–.09)
Threat appraisals (4 items)	8.54*	2	.98	.03	.09 (.04–.15)
Self-esteem (5 items)	13.98*	5	.96	.04	.07 (.03–.11)
Positive affect	11.25**	2	.96	.04	.11 (.05–.17)
Negative affect (4 items)	.44	2	1.00	.01	.00 (.00–.06)

*Note.* R-CFI = robust comparative fit index; SRMR = standardized root mean residual; R-RMSEA = robust root mean square error of approximation; CI = 90% confidence interval.

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

scaled  $\chi^2 = 907.42$  (491),  $p < .001$ ; R-CFI = .91; SRMR = .065; R-RMSEA = .045 (90% CI = .040–.049).

## Descriptive Statistics, Internal Reliabilities, and Pearson Correlations

The descriptive statistics, Pearson correlations, and internal consistencies of the scales used in the study are presented in Table 2. The results showed participants had moderate mean scores (i.e., close to the midpoint) for PAv goals, threat appraisals, and negative affect, whereas the other scales had high mean scores (i.e., above the midpoint). The internal reliability of all the scales was above .70.

## The Hypothesized Model

In the hypothesized model, Mardia's coefficient was relatively large (normalized estimate = 38.18) indicating non-normality in the data. One method assumed to improve normality and reliability is parceling, which reduces the number of observed variables in the model (e.g., Marsh et al., 1994). Based on the previous CFA results, parcels were formed by averaging the sum of the items with the highest and lowest factor loadings together in alignment with the recommendations of Little, Cunningham, Shahar, and Widaman (2002). In sum, the appraisal (i.e., challenge and threat) and well-being (self-esteem, affect) factors were each represented by two observed (parceled) indicators, whereas the goals had three (nonparceled).

Examination of the hypothesized model showed a satisfactory fit: scaled  $\chi^2 = 404.61$  (190),  $p < .001$ ; R-CFI = .94; SRMR = .059; R-RMSEA = .052 (90% CI = .045–.059). The Wald test, however, suggested removing two nonsignificant regression paths (i.e., the paths from a MAv goal to challenge appraisals, and a PAv goal to threat appraisals). Following these slight revisions, the model was re-estimated, and produced a similar and acceptable fit to the data: scaled  $\chi^2 = 408.35$  (192),  $p < .001$ ; R-CFI = .94; SRMR = .057; R-RMSEA = .052 (90% CI = .045–.058). The slightly revised model is presented in Figure 1.

## Mediational Effects

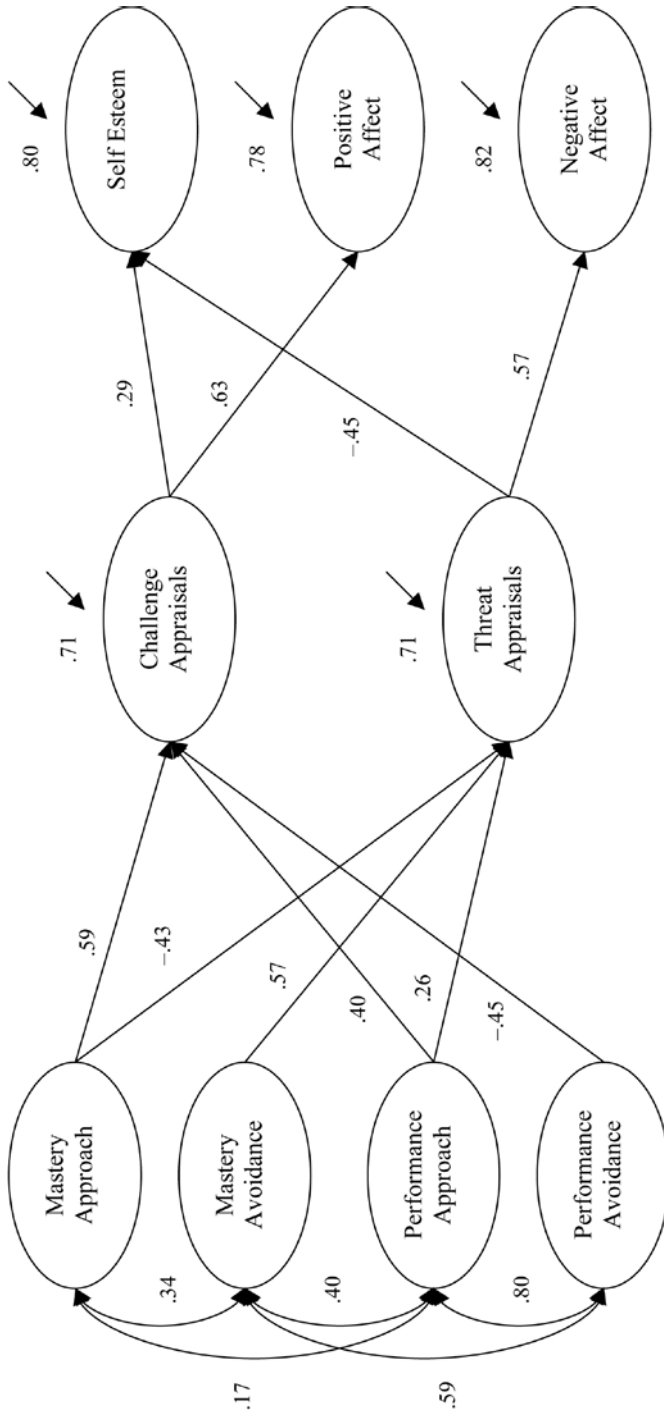
Following the recommendations of Holmbeck (1997), three separate models were tested to ascertain whether appraisals of sport competition mediated the hypothesized relationships between achievement goals and indices of well-being. The first model tested captured the direct hypothesized relationships from achievement goals to the well-being indicators. The fit of the first model was acceptable, scaled  $\chi^2 = 262.78$  (117),  $p < .001$ ; R-CFI = .95; SRMR = .052; R-RMSEA = .054 (90% CI = .045–.063). However, the paths from PAp and PAv goals to self-esteem, positive affect, and negative affect were all nonsignificant. Following Holmbeck's (1997) distinction between mediated (which require a significant path in Model 1) and indirect effects (which do not require such a path), we focused our mediation tests with respect to the paths from the mastery-based goals to self-esteem, positive affect, and negative affect.

The next model to test is the constrained model examining the hypothesized relationships from the predictor variables to the mediators and from the mediators

**Table 2 Descriptive Statistics and Bivariate Correlations for the Study Variables**

Variable	<i>M</i>	<i>SD</i>	$\alpha$	1	2	3	4	5	6	7	8	9
1) Mastery approach	6.02	0.88	.73	—	.26**	.12*	-.04	.51**	-.14**	.33**	.45**	-.13*
2) Mastery avoidance	4.79	1.39	.82	—	—	.33**	.47**	.02	.40**	-.18**	.02	.30**
3) Performance approach	4.26	1.44	.81	—	—	—	.65**	.09	.33**	-.16**	.06	.19**
4) Performance avoidance	3.59	1.60	.85	—	—	—	—	-.13**	.45**	-.30**	-.11*	.24**
5) Challenge appraisals	5.73	0.89	.78	—	—	—	—	—	-.26**	.35**	.51**	-.17**
6) Threat appraisals	2.98	1.16	.73	—	—	—	—	—	—	-.41**	-.18**	.37**
7) Self-esteem	5.33	0.78	.85	—	—	—	—	—	—	—	.29**	-.40**
8) Positive affect	5.54	0.90	.82	—	—	—	—	—	—	—	—	-.38**
9) Negative Affect	3.31	0.81	.70	—	—	—	—	—	—	—	—	—

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



**Figure 1** — The slightly revised model showing the relationships between achievement goals, appraisals of competition, and indices of well-being. *Note.* All coefficients presented are standardized and significant ( $z > 1.96$ ). Not visually presented are the correlated disturbances of challenge and threat appraisals ( $-.24$ ), and positive and negative affect ( $-.50$ ).

to the outcome variables (Holmbeck, 1997). This step was tested previously via the hypothesized model and produced an acceptable fit to the data. As can be seen from Figure 1, and aligned with the guidelines of Baron and Kenny (1986), it was only possible to test the mediational effects of challenge appraisals from the M<sub>AP</sub> goal to positive affect, whereas only threat appraisals could potentially mediate the relationships from M<sub>AP</sub> and M<sub>AV</sub> goals to negative affect. Based on Baron and Kenny's (1986) guidelines, challenge and threat appraisals could both serve as mediators of the paths from M<sub>AP</sub> and M<sub>AV</sub> goals to self-esteem.

The third and final model to test is the unconstrained model which is a replication of Model 2 but has the added significant paths (as established in the first model) from the predictor to the outcome variables. The unconstrained model produced a good fit to the data, (scaled  $\chi^2 = 383.58$  (187),  $p < .001$ ; R-CFI = .94; SRMR = .053; R-RMSEA = .050 (90% CI = .043–.057). The path from challenge appraisals to self-esteem was not significant ( $p > .05$ ) in the unconstrained model. Therefore, it was not possible to establish mediation through challenge appraisals in explaining the paths from mastery-based goals to self-esteem (Baron & Kenny, 1986).

One way of interpreting a mediational effect is to compare the chi-square of the constrained model with the unconstrained model (Holmbeck, 1997). A significance test developed by Satorra and Bentler (2001) was used to examine the difference between the scaled chi-square statistics of the nested models. The results showed that the constrained model was significantly different from the unconstrained model ( $\Delta\chi^2_{(5)} = 21.22$ ;  $p < .001$ ). This was because the direct paths from the mastery goals to indices of well-being in the unconstrained model were not reduced to nonsignificance when controlling for appraisals of competition. In other words, full mediation was not supported. According to Baron and Kenny, (1986), a more realistic goal under these circumstances is to proceed to test partial mediation. Specifically, the significant path coefficient from M<sub>AP</sub> goals to self-esteem ( $b = .58$ ), although remaining significant, dropped when controlling for threat appraisals ( $b = .35$ ). This too was the case for the relationship between the M<sub>AV</sub> goal and self-esteem ( $b = -.45$  to  $-.10$ ). Further, the relationship from a M<sub>AP</sub> goal to positive affect was partially mediated by challenge appraisals (i.e.,  $b = .62$  to  $.34$ ). Partial mediation was also evident for the relationships from the M<sub>AP</sub> goal to negative affect ( $b = -.37$  to  $-.24$ ) and M<sub>AV</sub> goal to negative affect ( $b = .57$  to  $.37$ ) via threat appraisals.

## Gender Invariance Testing

The next part of the analysis was to discern the extent to which the hypothesized model was invariant with respect to gender. A series of progressive steps outlined by Bentler and Wu (2002) were followed. SEM multisample analysis begins by establishing a good-fitting model separately for the different groups. Good-fitting models emerged for both gender groups: scaled  $\chi^2$  (192) = 317.80 (male)/311.54 (female),  $p < .001$ ; R-CFI = .94/.94; SRMR = .071/.067; R-RMSEA = .053/.058 (90% CI = .042/.045–.063/.069). Given no revisions were warranted, the next step was to run an unconstrained model simultaneously for the male and female groups. This next step serves as a baseline for testing the equality of parameter constraints in subsequently increasingly restrictive nested models.

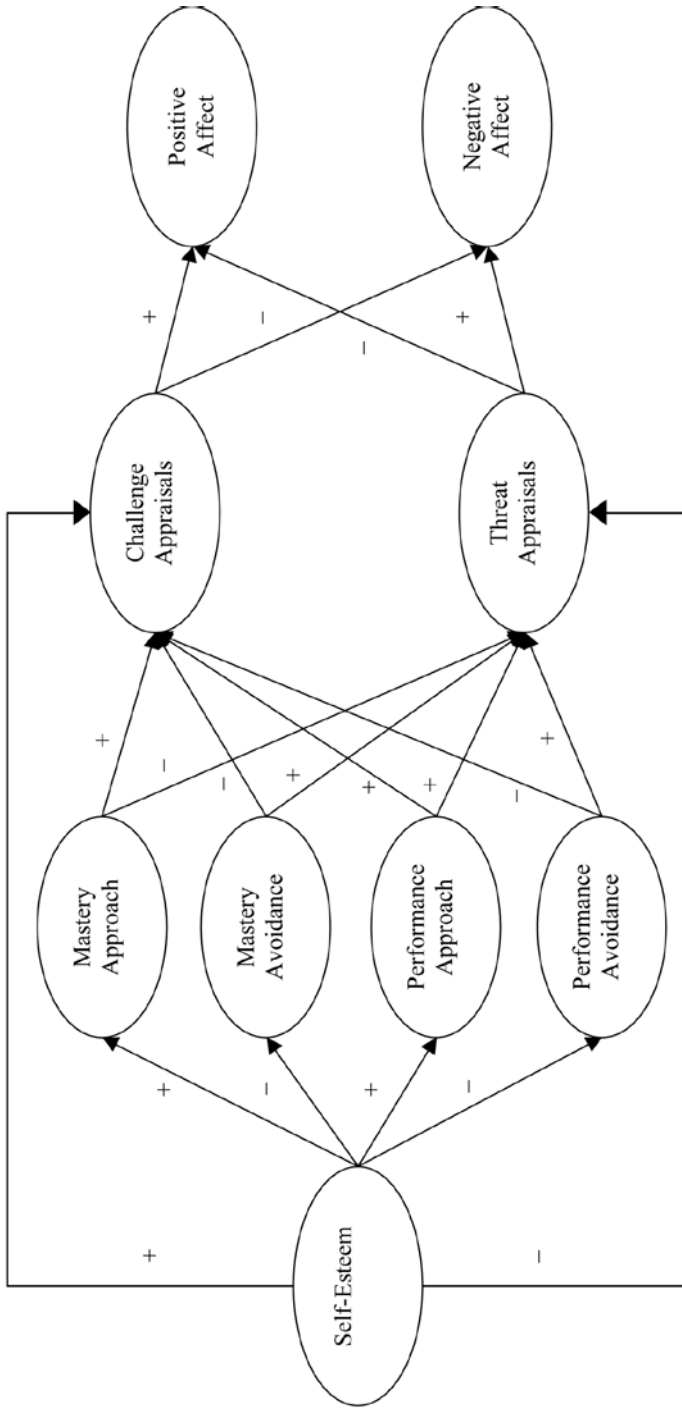
After establishing a good-fitting baseline model (scaled  $\chi^2 = 629.53$  (384),  $p < .001$ ; R-CFI = .94; SRMR = .069; R-RMSEA = .055 (90% CI = .047–.063), a model constraining the equality of factor loadings across gender was tested (scaled  $\chi^2 = 650.21$  (397),  $p < .001$ ; R-CFI = .93; SRMR = .072; R-RMSEA = .055 (90% CI = .047–.062). Despite producing a similar fit to the unconstrained model, the factor loading for one item on the MAP goal scale was significantly different across the male and female samples. Before releasing this noninvariant item, the model was retested setting a different set of factor loadings to 1 for the purpose of scale model identification. The same noninvariant MAP item was detected and thus it was allowed to be freely estimated in all further tests of invariance. The variances/covariances of the latent factors were the next set of constraints imposed and the results revealed a satisfactory model fit, scaled  $\chi^2 = 675.07$  (405),  $p < .001$ ; R-CFI = .93; SRMR = .088; R-RMSEA = .056 (90% CI = .049–.063). However, the variance of the MAP goal was found to significantly vary across gender groups. Thus, the constraint of this parameter was released. Next, the equality of constraints of the regression paths were tested in the model and gender invariance was supported, scaled  $\chi^2 = 667.13$  (414),  $p < .001$ ; R-CFI = .93; SRMR = .081; R-RMSEA = .054 (90% CI = .046–.061).

### Alternative Hypothesized Model

Before we accepted the hypothesized model as the most parsimonious interpretation of the data, it was also important to consider other conceptually sound competing models that produce an equal or greater fit of the same data. Therefore, an alternative model (see Figure 2) was also estimated based on Elliot's (1999) proposition that self-esteem could serve as an antecedent of the four goals. Also depicted in Figure 2 is the theoretical link from self-esteem to appraisals (Lazarus & Folkman, 1984). The alternative model produced a poor fit to the data: scaled  $\chi^2 = 772.31$  (193),  $p < .001$ ; R-CFI = .83; SRMR = .14; R-RMSEA = .084 (90% CI = .078–.090), especially when compared with the main hypothesized model. Nonetheless, to determine which of the non-nested models should be chosen, the Akaike information criterion (AIC) was calculated (see Kline, 2005). The AIC is a parsimonious fit index, and the model with the smallest AIC value is preferred because it is more likely to be replicated in another sample of the same population. In this study, the hypothesized model (AIC = 530.35) was more parsimonious than the alternative model (AIC = 892.31). Based on these results, the alternative model was disregarded as a viable model.

## Discussion

The primary purpose of this study was to test a model examining the hypothesized relationships of approach and avoidance goals to competition appraisals to positive and negative indices of well-being. The discussion will focus on the findings stemming from the hypothesized model. Also interpreted in the discussion are the findings from the mediational analyses and tests of gender invariance.



**Figure 2** — An alternative model showing the theorized relationships between self-esteem, achievement goals, appraisals of competition, and well-being. *Note.* Not visually presented are the hypothesized correlated disturbances between challenge and threat appraisals, and positive and negative affect.

## Achievement Goals and Appraisals of Sport Competition

The premise (McGregor & Elliot, 2002) that achievement goals serve as an interpretative framework for differential appraisals of the objective environment was supported in the current study. That is, achievement goals accounted for approximately half of the explained variance in challenge (50.3%) and threat appraisals (49%) regarding sport competition. Aligned with our hypotheses and the findings of McGregor and Elliot (2002), MAp goals were strongly and positively associated with challenge appraisals of sport competition. This result suggests that individuals concerned with task mastery and personal improvement are more likely to view a demanding and potentially stressful event (i.e., a sport competition) as an opportunity for accomplishment and personal growth. Such a finding is consonant with Roberts (1986) who argued that when achievement is viewed in self-referenced terms, individuals are prepared to exert maximal effort to overcome the potential challenges faced in a forthcoming sport competition. Also in support of Roberts (1986) was the finding indicating that individuals endorsing a MAp goal were less likely to view competition as a threat. McGregor and Elliot (2002) also hypothesized a negative link between MAp goals and threat appraisals, but did not confirm this relationship. Future research could address whether these results were different as a function of methodology (i.e., tapping appraisals regarding a hypothetical scenario versus real-life event), level of measurement (i.e., whether the focus is on dispositional versus state appraisals), or the context investigated (sport versus education).

The findings regarding the relationships of MAv goal adoption to challenge and threat appraisals partially supported our hypotheses. A MAv goal emphasis was a strong positive predictor of threat appraisals, but was unrelated to challenge appraisals. The present results are aligned with recent sport research (Conroy et al., 2006; Nien & Duda, *in press*) and indicate that the adoption of MAv goals corresponds to aversive rather than positive processes and outcomes (Elliot & Conroy, 2005). The avoidance aspect of competence embedded in the MAv goal might have acted as an overriding factor in anticipating a competition to be potentially harmful. Simply put, athletes who are concerned that they can no longer meet targeted self/task-referenced standards are more likely to interpret a sport competition as a threat.

Aligned with our hypotheses, a PAp goal was positively related to challenge and threat appraisals. The significant relationship between PAp goal adoption and challenge appraisals did not emerge in the bivariate correlations. Although our finding should be interpreted with caution, it does suggest PAp goal adoption is beneficial to viewing sport competition as an opportunity for personal growth. However, the results also highlight the hidden costs of endorsing a PAp goal suggested elsewhere in recent sport literature (e.g., Elliot & Conroy, 2005; Nien & Duda, 2007). Given that the inherent aim of a PAp goal is to outperform others, and that it is not always possible to be the best in a competition, our results also imply that individuals who endorse a PAp goal would expect to feel threatened by what they perceive is at stake when approaching a sport contest (i.e., validation of the self; Elliot & Moller, 2003).

In contrast to McGregor and Elliot (2002), we found that individuals adopting a PAp goal tended to interpret a forthcoming sports competition as a threat.



It is possible that in a sport setting, PAp goal adoption induces a concern that the future performance of athletes relative to others is on public display (see Elliot & Conroy, 2005). Thus, it is possible that fear of failure is more salient in fueling PAp goal adoption in sport (Nien & Duda, *in press*), which may lead to negative consequences. In contrast, it is not possible in education settings, unless cheating, for individuals to draw comparisons with another's performance at the time of a classroom examination. It is reasonable to speculate that individuals adopting a PAp goal are less likely to consider the prospect of taking a future classroom test to be threatening because their ability at the time of the test cannot be evaluated publicly.

The results regarding the hypothesized relationships from a PAv goal to challenge and threat appraisals were partially supported. Despite finding PAv goal adoption to be strongly and negatively associated with challenge appraisals, threat appraisals were not predicted. In contrast, McGregor and Elliot (2002) found a positive association between PAv goal adoption and threat appraisals but no relation between this goal and challenge appraisals.

There are potentially two reasons why PAv goal adoption did not predict threat appraisals of sport competition. Firstly, MAV and PAV goals may have taken up much of the shared variance in predicting threat appraisals when one considers that both of these goals were highly correlated with the PAv goal. Second, it is possible that the null finding might be explained by the way cognitive appraisals were assessed in the present investigation. In the current study, athletes' tendencies regarding how they typically appraised a hypothetical sport competition were measured. In the McGregor and Elliot (2002) study, students' appraisals were assessed before a real-life examination. It would be interesting in subsequent research to examine the role of achievement goal adoption, and in particular the emphasis placed on PAv goals, in terms of the prediction of cognitive appraisals when the latter are assessed in close proximity to a real-life sport competition.

## Appraisals of Sport Competition and Well-Being

The proposition (Lazarus, 1999; Lazarus & Folkman, 1984) that variability in cognitive appraisals of a stressful event is relevant to personal well-being was supported in the present research. Consonant with theoretical predictions, challenge and/or threat appraisals accounted for approximately 36% of the variance explained in self-esteem, 39% of the variance in positive affect, and 33% in negative affect. Aligned with our hypotheses, challenge appraisals were strongly and positively related to positive affect, and moderately and positively linked to self-esteem. The results suggest that the more individuals anticipate a sport competition as an opportunity for growth and mastery (i.e., a positive challenge), the greater the degree of well-being they will experience.

The present findings are also aligned with theoretical tenets that suggest threat appraisals pose a potential danger to one's personal welfare (Lazarus, 1999). In particular, we observed a strong and positive relationship from threat appraisals of sport competition to negative affect, whereas the path from threat appraisals to self-esteem was moderately strong and negative. These results may be due to the possibility that individuals who interpret a sport competition to be threatening to their goals do not have the potential resources to cope with anticipated stressors

which could ensue in compromised well-being. Overall, the results are consistent with theoretical predictions and past findings (e.g., Giacobbi et al., 2007; Lazarus, 1999; Ntoumanis & Biddle, 1998) and imply that how participants appraise sport competition is a key determinant of the degree of well-being experienced by athletes.

### **Mediational Effects of Cognitive Appraisals**

Following the lead of McGregor and Elliot (2002), we assumed achievement goals to serve as a perceptual framework underlying athletes' interpretation of the objective and competitive environment. Lazarus (1993) has argued that cognitive appraisals of a stressful event would mediate the relationship between the demands of and views regarding the objective environment and cognitions, emotions, and behaviors. Based on these assumptions, we hypothesized that cognitive appraisals would mediate the relationships between approach and avoidance goal emphasis in the sport domain and indicators of athletes' welfare. Our hypotheses were generally supported in that challenge and threat appraisals were found to partially mediate the relationship to the targeted indices of well-being from the mastery-based goals (i.e., M<sub>Ap</sub> and M<sub>Av</sub>) only. These findings suggest that athletes adopting a M<sub>Ap</sub> goal are more likely to experience positive affect because they view sports competition as more challenging. Individuals with a high M<sub>Ap</sub> goal emphasis were also more likely to have high self-esteem because of a tendency to view a sport competition as less threatening. The mediation results further suggested that individuals with a higher M<sub>Av</sub> goal focus had lower self-esteem possibly because they deemed a sport competition to be more threatening. Participants with a high M<sub>Av</sub> goal adoption, or low M<sub>Ap</sub> goal adoption, were also more prone to experiencing negative affect partly as a consequence of appraising sport competition as a threat to one's self. The mediational results highlight the positive benefits of endorsing M<sub>Ap</sub> goals, and the negative repercussions of endorsing M<sub>Av</sub> goals. They also suggest cognitive mechanisms by which these goals may facilitate or inhibit athletes' psychological and emotional welfare.

Based on arguments by Holmbeck (1997), we did not test the mediational role of cognitive appraisals of sport competition in explaining the hypothesized paths from P<sub>Ap</sub> and P<sub>Av</sub> goals to self-esteem as well as positive and negative affect. This was because the direct relationships from the performance goals (i.e., P<sub>Ap</sub> and P<sub>Av</sub> goals) to the various indices of well-being were initially found to be statistically nonsignificant. It may be that P<sub>Ap</sub> and P<sub>Av</sub> goals are relevant to athletes' degree of well-being, but not to the particular indices investigated in this study. Thus, future research could consider alternative measures of well and ill-being (e.g., burnout; see Raedeke & Smith, 2001).

### **Gender Invariance**

In this study, we expected that the relationships of the four goals to cognitive appraisals (i.e., challenge and threat) and indices of athletes' welfare would be invariant across gender. On the whole, findings from the SEM multisample analyses supported this notion. These results, in conjunction with the findings stemming from other studies conducted in the physical domain (Nien & Duda, in press; Wang et al., 2007) provide support for the utility of the 2 × 2 achievement goal framework

for males and females. Future research is warranted that determines whether this framework holds equally well across different sport settings or athlete groups (e.g., by comparing individual versus team sport athletes and/or athletes participating at different competitive levels).

## Limitations, Future Directions, and Conclusions

The main limitation of the current study was the correlational nature of the data. Extending the current work, subsequent research could ascertain whether individuals adopt the same goals across time (e.g., Conroy et al., 2006; Moller & Elliot, 2006), and test the implications of differential goal adoption for competition appraisals and the well-being of athletes across a whole season. To provide information regarding causality, it would be interesting to examine the relevance of the four goals to cognitive appraisals and indicators of well-being under experimental conditions. A further drawback of the current study was that only self-reported measures of the targeted variables were considered. We do not yet know how approach and avoidance achievement goals and corresponding cognitive appraisals of competition relate to objective measures of well/ill-being (e.g., immune functioning).

In the current study, cognitive appraisals were measured in reference to a hypothetical situation. Despite the noninvasive nature of the hypothetical approach and the fact that we controlled for previous outcome (i.e., win/loss record) and game significance (i.e., game importance/difficulty), our data are inferred based on participants' ability to recollect how they would typically appraise such an event. According to Lazarus (Lazarus, 1999; Lazarus & Folkman, 1984), the experiences of well- and/or ill-being are also dependent on whether the sources of stress from an achievement event are perceived as more or less controllable. Secondary appraisals were not targeted in this study. That is, we did not assess the individuals' interpretation of their efficacy to deploy available coping strategies as a means of overcoming perceived difficulties (e.g., Skinner & Brewer, 2004). To extend the present work, a prospective design could be employed to investigate the implications of goal adoption with respect to primary and secondary appraisals of a real-life competition (e.g., play-off final) and ensuing well-being.

Given that goal adoption is shown to be associated with variability in well-being, it would also benefit subsequent studies to find out more about how the four goals are differentially fostered in sport settings. One hypothesized antecedent of goal adoption (i.e., Elliot, 1999) that can be manipulated to promote differential goal emphasis is the motivational climate created by significant others. Recently, a measure of the motivational climate was developed to assess PE students' perceptions of mastery, performance approach, and performance avoidance (as well as social approval) goals emphasized by their teachers (Papaioannou, Milosis, Kosmidou, & Tsigilis, 2007). Perhaps another interesting avenue to pursue would be to discern which aspects of the motivational climate impact the importance placed on the four goals and that hold implications for athletes' welfare. Overall, the present findings suggest that the adoption of MAp goals should be fostered for both male and female athletes if we aim to create positive psychological and emotional experiences in competitive sport situations.

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