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Olympiou, A; Jowett, S; Duda, Joan

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# **The Psychological Interface Between the Coach-Created Motivational Climate and the Coach-Athlete Relationship in Team Sports**

**Alkisti Olympiou**  
University of Leeds

**Sophia Jowett**  
Loughborough University

**Joan L. Duda**  
University of Birmingham

The study's objective was to investigate the motivational significance of the coach-athlete relationship in team sports. 591 athletes completed the Perceived Motivational Climate in Sport Questionnaire (Newton, Duda, & Yin, 2000) to assess perceptions of the coach-created motivational climate and two Coach-Athlete Relationship Questionnaires to assess direct perceptions (Jowett & Ntoumanis, 2004) and meta-perceptions (Jowett, in press) of the relationship quality. Canonical correlation analyses revealed that the perceived task-involving features of the coaching climate, in which role importance, co-operation, and improvement are emphasized, were associated with experiencing higher levels of closeness, commitment, and complementarity with the coach. Perceptions of the ego-involving features of the coach-created environment which emphasizes punitive responses to mistakes, rivalry, and unequal recognition were associated with lower levels of perceived closeness, commitment, and complementarity with the coach. These results support the notion that the coach-athlete relationship has implications for the motivation of athletes participating in team sports.

The interpersonal dynamics between the coach and the athlete are central to the coaching process. Consequently, research in this area stems from the need to build a systematic, comprehensive, and empirically grounded body of knowledge that contains practical applications for coaches, athletes, and other practitioners (Jowett & Poczwardowski, 2007). Over the last three decades, the interpersonal dynamics involved between coaches and their athletes have attracted the research interest of psychologists, sociologists, and pedagogists (e.g., Jones, Glintmeyer, & McKenzie, 2005; Mageau & Vallerand, 2003). Within sport psychology, the

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Olympiou is with the Sport and Exercise Sciences University of Leeds, Leeds, UK. Jowett is with the School of Sport and Exercise Sciences, Loughborough University, LE11 3TU, UK. Duda is with the School of Sport and Exercise Sciences, University of Birmingham, Birmingham, UK.

findings of numerous studies indicate that leadership behaviors manifested by coaches affect athletes' satisfaction and performance (Chelladurai, 1984; Riemer & Toon, 2001), as well as athletes' self-esteem (Smith, Zane, Smoll, & Coppel, 1983), confidence and anxiety (Kenow & Williams, 1992). However, one area that has received less attention concerns the interplay between the perceived over-riding motivational climate created by the coach and the interpersonal dynamics between coaches and athletes. This relationship is important because it can supply knowledge of the interpersonal conditions that foster adaptive or compromised motivated behavior. The correspondence between the motivational climate and interpersonal dynamics also holds implications for understanding how the prevailing motivational atmosphere on a team is manifested at the level of coach-athlete interactions. Duda and Balaguer (1999) attempted to fill this gap by proposing an integrated conceptual model that considers two popular coach leadership models, namely, the multidimensional model (Chelladurai, 1993) and the mediational model (Smoll & Smith, 1989), as well as an achievement motivation framework (Nicholls, 1984). The discussion that follows aims to first describe briefly the main theoretical frameworks contained in the integrated model and second outline the main assumptions the integrated model offer.

The multidimensional model of coach leadership presents the antecedents and consequences of three states of coach behaviors namely, required (i.e., behaviors the coach is required to manifest as a result of the sport characteristics and athletes' characteristics), actual (i.e., behaviors the coach actually manifests in training and/or competition as a result of his/her characteristics), and preferred (i.e., behaviors the athletes prefer their coaches to manifest as a result of their characteristics and characteristics of their sport; Chelladurai, 1993). The model postulates that athletes' performance and satisfaction are a function of the degree of congruence among the three states of coach behaviors (Chelladurai, 1993; see Riemer, 2007, for a review).

The mediational model of coach leadership postulates that the effects of a coach's actual behaviors (i.e., observed coach behaviors) on an athlete's evaluative reactions (e.g., athletes' attitudes toward the coach and the sport) are mediated by the athlete's perceptions and recall of the coach's behaviors. Moreover, it has been suggested that situational factors (e.g., nature of sport, competition level) and individual difference characteristics (e.g., gender, coaching goals, athlete self-esteem) act as moderators of the mediated relationship (Smith & Smoll, 2007, for a review).

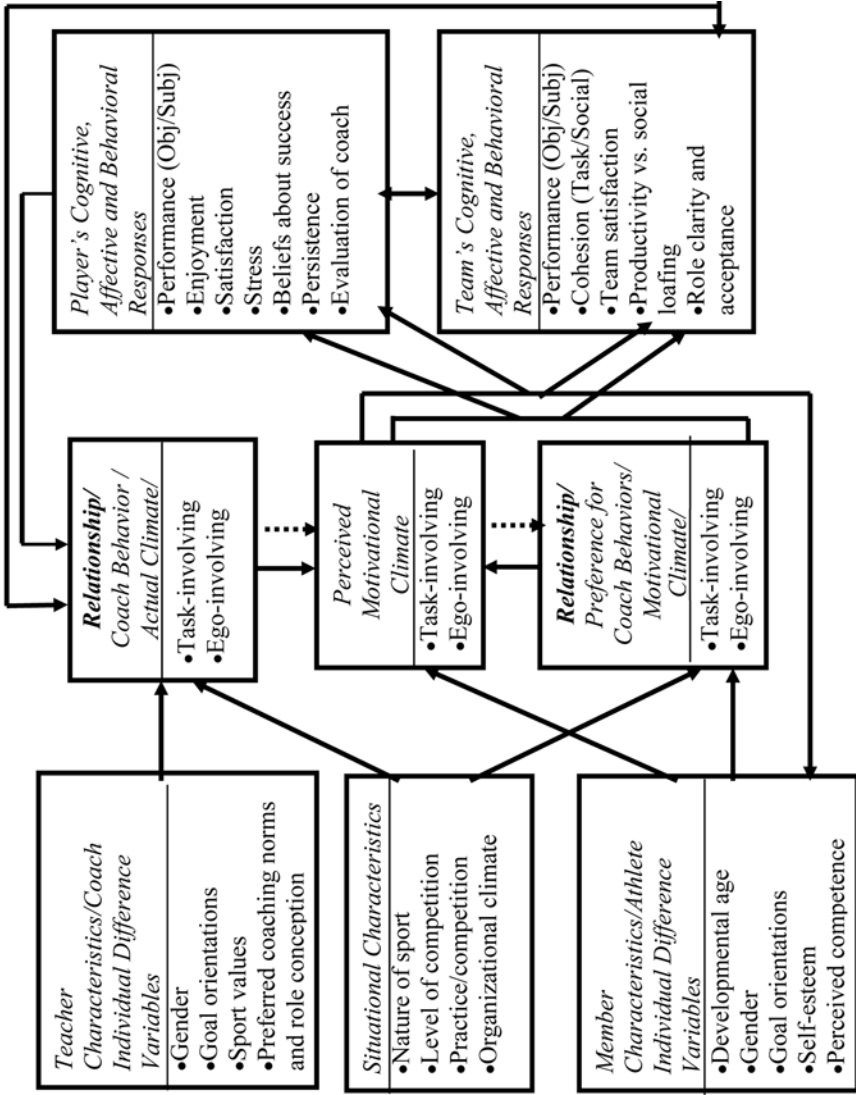
While leadership models postulate that coach behaviors affect athletes' perceptions and experiences of sport, achievement goal theory (Nicholls, 1984) postulates that the meaning individuals (in this case, athletes) ascribe when engaging in achievement activities such as organized sport, influences their motivation-related patterns. According to the theory, there are two major achievement goals namely task and ego; each of these goals capture distinct ways individual athletes conceive and evaluate competence and success. When an athlete is focused on a task goal, perceptions of competence are self-referenced (e.g., he or she wishes to improve one's personal performance and/or try one's best). When an athlete is focused on an ego goal, perceptions of competence are other-referenced (e.g., he or she wishes to outperform opponents or even other members of the team or squad). According to achievement goal theory (Nicholls, 1984), task goals are

adaptive and empowering regardless of individuals' levels of perceived competence while ego goals are maladaptive and compromising especially when individuals have doubts about their competence. This distinction in emphasis on task and ego goals has also been transferred to the psychological coach-created environment in which athletes practice their sport (Duda & Balaguer, 2007 for a review). Accordingly, if the coach is perceived to create a task-involving climate (e.g., a coach makes sure the technique is practiced) then athletes are more likely to develop adaptive and positive motivational patterns. Conversely, if the coach is perceived to create an ego-involving climate (e.g., a coach encourages athletes to out-perform others) then athletes are more likely to exhibit maladaptive cognitions, affective, and behavioral responses.

Duda and Balaguer (1999) integrated the above discussed theoretical frameworks and proposed that coach leadership behaviors hold implications for motivational processes (see Figure 1). Correspondingly, coach leadership behaviors are viewed as instrumental in developing motivated, competent, and satisfied athletes as well as teams. The integrated model essentially highlights that coach behaviors that reward athletes' efforts for improving skill (i.e., foster task-involvement) as opposed to coach behaviors that reward athletes' success as measured by statistics and scoreboards (i.e., promote athletes' focus on comparative ability or an emphasis on ego-involving goals) impact athletes' motivational patterns differentially which in turn affect important outcomes such as performance and satisfaction (Duda, 2001; Duda & Balaguer, 1999). The integrated model has started to gain empirical support in revealing the associations that exist between tenets of the achievement goal theory and tenets of coach leadership models through a series of correlational studies (Balaguer, Duda, Atienza, & Mayo, 2002; Balaguer, Duda, & Crespo, 1999; Balaguer, Duda, & Mayo, 1997).

Balaguer et al.'s (2002) study aimed to examine the interrelationships between the task- and ego-involving features of the climate and athletes' perceptions of their coach's leadership behaviors in a sample of Spanish female handball players. They found that a perceived task-involving motivational climate was positively related to athletes' perceptions of improvement with the technical, tactical, and psychological facets of performance. Moreover, it was found that perceptions of a task-involving climate were associated with athletes' ratings of their coach as an "ideal" coach. More recently, Smith, Fry, Ethington, and Li (2005) examined a sample of U.S. female high school athletes and found that such coaching behaviors as the provision of positive and encouraging feedback, as well as ignoring mistakes, were positively associated with a perceived task-involving motivational climate; whereas such coaching behaviors as the provision of punishment were positively associated with a perceived ego-involving motivational climate.

The present study attempted to expand the existing theoretical and empirical evidence by incorporating the notion of the coach-athlete relationship within Duda and Balaguer's (1999) integrated model (see Figure 1 in bold). While the coach-athlete relationship and the coach leadership reflect social contexts where interaction takes place, the coach-athlete relationship and coach leadership are distinct concepts albeit interrelated (see Jowett & Chaundy, 2004). Their distinctiveness is reflected in the different definitions, operationalizations, and measurement tools employ (see e.g., Chelladurai & Riemer, 1998; Jowett, in press, 2007c). Here it is argued that while leadership models broadly focus on coach behaviors



**Figure 1** — Duda and Balaguera's (1999) adapted integrated model of the antecedents and consequences of coach leadership and coach-athlete relationships.

that originate within the coach and emphasize what a coach does to an athlete/s, relationship models emphasize what goes on in the relationship by focusing on the mutual and causal interconnections of coach's and athlete's feelings, thoughts, and behaviors (see, Jowett & Poczwardowski, 2007).

The coach-athlete relationship has been defined (e.g., Jowett, 2007a, 2007c; Jowett, Paull, & Pensgaard, 2005) as the situation in which coaches' and athletes' feelings (closeness), thoughts (commitment), and behaviors (complementarity) are interconnected (co-orientation). This definition led to the development of a conceptual model known as the 3 + 1 Cs model (see Jowett, 2007a, 2007c). Closeness describes the affective ties of the relationship members and represents such interpersonal feelings as trust, respect and liking. Commitment reflects the cognitive element of the relationship and defines coaches' and athletes' desire to continue the relationship in the future. Complementarity captures the degree to which coaches' and athletes' affiliation transpires through what each relationship member does in relation to the other during practice.

A major advantage that typifies the 3 + 1 Cs model of the coach-athlete relationship is its emphasis on the bidirectional nature of the relationship. This bidirectionality is manifested through the construct of co-orientation (Jowett, 2005, 2007a, 2007c). This construct contains two sets of interpersonal perceptions: direct perceptions (e.g., "I trust my coach/athlete") and meta-perceptions (e.g., "My coach/athlete trusts me"). The direct perceptions assess an athlete's (coach's) personal view of the relationship in terms of the 3 Cs, while meta-perceptions assess an athlete's (coach's) judgment of how the other thinks of the relationship in terms of the 3 Cs. Social psychological research has a long history of studying meta-perceptions or what people think others think of them (e.g., see Baldwin, 2005; Kenny, 1994; Laing, Phillipson, & Lee, 1966; Newcomb, 1953). Kenny (1994) argues that "people are not passive objects and as such when we perceive them, they perceive us in return....people try to perceive others' perceptions of them" (p. 144). Thus, the quality and functions of the coach-athlete relationship are likely to be determined by both direct and meta-perceptions (Jowett, 2005).

The research conducted thus far applying the 3 + 1 Cs, includes an examination of the impact of these relationship constructs on athletes' perceptions of satisfaction with performance (Jowett & Don Carolis, 2003), on athletes' perceptions of team cohesion (Jowett & Chaundy, 2004), on athletes' perceptions of self-concept (Jowett, 2008), and on both athletes' and coaches' interpersonal perceptions (Jowett & Clark-Carter, 2006). Nevertheless, there is no research linking dimensions of the coach-athlete relationship to athletes' views regarding the task- and ego-involving features of the coach-created climate despite the assumption that the context of interpersonal relationships has motivational significance (see Ames, 1992; Nicholls, 1989). Thus, it is argued that the qualities of the coach-athlete relationship (as targeted in the 3 C + 1Cs), just like specific coach leadership behaviors, hold inherent social and motivational meanings whereby coaches and athletes are inclined to elicit specific types of responses from each other (cf. Duda & Balaguer, 1999).

The purpose of this study was to explore the extent to which athletes' direct and meta-perceptions of their relationship with the coach (as defined by closeness, commitment, and complementarity) are linked to athletes' perceptions of the

degree to which the coach-created climate on their team is more or less task-involving and ego-involving. It is hypothesized that the two targeted dimensions of the motivational climate will be related to the perceived coach-athlete relationship in a conceptually coherent fashion. More specifically, we expected athletes who experience the coaching climate as more task-involving and less ego-involving would be more likely to perceive the relationship with the coach as marked by more closeness, commitment and complementarity (direct perceptions). Moreover, perceptions of a task involving coaching climate would be associated with athletes' beliefs that their coach views their relationship with the athletes in question as being closer, more committed and characterized by complementarity (meta-perceptions).

## Method

### Participants

A total of 591 British athletes who participated in organized team sports including football, rugby, volleyball, basketball, and hockey participated in the study. The sample was comprised 414 (70%) men and 177 (30%) women and their age ranged from 16 to 36 years. Different levels of sport performance were represented ranging from national and international ( $N = 192$ , 33%) to regional, county, club and recreational levels ( $N = 399$ , 67%). While all of the athletes had a relationship that spanned no less than three months with their coaches, approximately half of the athletes ( $N = 308$ , 52%) had been with their coach for less than 6 months. The remainder of the athletes ( $N = 288$ , 48%) had been with their coach for over 6 months.

### Procedure

A letter was prepared and sent to the principal coaches of a large number of teams across England. The letter included information concerning the purpose of the study and descriptions of what would be required of the coaches and their athletes once they consented to participate. Anonymity and confidentiality were guaranteed, and the voluntary nature of participation was discussed. Coaches were subsequently contacted by phone to confirm their participation. Upon agreement, a mutually convenient date was arranged to meet the team and administer a multi-section questionnaire to the athletes. Administration of the questionnaires took place on the teams' training grounds. After providing their informed consent, athletes completed the questionnaire before the commencement of a training session without their coaches' intrusion or interference. Data were collected during a three-month period. The study was approved by the University's ethical advisory committee.

### Instrumentation

**The Coach-Athlete Relationship Questionnaire.** Two questionnaires were used to measure athletes' direct perceptions and meta-perceptions of the quality

of the coach-athlete relationship. The 11-item Coach-Athlete Relationship Questionnaire (CART-Q; Jowett & Ntoumanis, 2004) was employed to measure direct perceptions of closeness (4 items; e.g., “I trust my coach”), commitment (3 items; e.g., “I am committed to my coach”), and complementarity (4 items; e.g., “When I am coached by my coach, I am at ease”). The meta-perception version of the CART-Q (Jowett, 2007b; in press) uses the 11 items contained in the direct perception version of the CART-Q in an appropriately phrased manner to measure meta-perceptions or more specifically athletes’ perceptions of their coaches’ closeness (4 items; e.g., “My coach trusts me”), commitment (3 items; e.g., “My coach is committed to me”), and complementarity (4 items; e.g., “When my coach coaches, she/he is at ease”). Responses to the direct and meta-perception versions were made on a seven-point scale ranging from *strongly disagree* (1) to *strongly agree* (7). The direct perceptions version of the CART-Q demonstrated acceptable internal consistency scores with this sample: .87 for Closeness, .81 for Commitment, and .85 for Complementarity. Correspondingly, the internal consistency scores for the meta-perception version of the CART-Q were satisfactory; .84 for meta-Closeness, .79 for meta-Commitment, and .87 for meta-Complementarity.

There is empirical evidence and conceptual rationale to support the adequacy and appropriateness of both versions of the CART-Q in terms of content, construct, and criterion validity as well as reliability (see e.g., Jowett, 2007b, in press; Jowett & Ntoumanis, 2004). Nonetheless, Confirmatory Factor Analyses (CFA) were conducted to assess the construct validity of both versions with this sample. The recommended hierarchical factor structure of the coach-athlete relationship whereby the constructs of closeness, commitment, and complementarity were subsumed under a higher order factor (e.g., Jowett, in press; Jowett & Ntoumanis, 2004) was tested using EQS 5.7b (Bentler, 1995). The fit indices used to assess the capability of the model to fit the data included: the robust Comparative Fit Index (CFI); the Non-Normed Fit Index (NNFI); and the Standardized Root Mean Square Residual (SRMR). It has been recommended that values approaching .95 for both the CFI and NNFI should be considered satisfactory, whereas for the SRMR values close to .08 would indicate better fitting models (Hu & Bentler, 1999). The hierarchical model of the direct perception version of the CART-Q revealed satisfactory goodness of fit indices suggesting that the model fit the data well with the current sample [robust CFI=.93, NNFI = .92, SRMR = .04]. In terms of the direct perceptions version, the loadings for closeness, commitment, and complementarity onto the higher order factors were .89, .93, and .98 respectively, whereas the loadings of their designated items ranged from .67–.89. A hierarchical, second-order factor model was also tested for the meta-perception version of the CART-Q. CFA revealed satisfactory goodness of fit indices [robust CFI=.95, NNFI = .92, SRMR = .04]. In terms of the meta-perceptions version, the loadings for meta-closeness, meta-commitment, and meta-complementarity onto the higher order factor were .97, .98, and .99 respectively, whereas the loadings of their designated items ranged from .67–.82. All factor loadings were statistically significant.

**The Perceived Motivational Climate in Sport Questionnaire.** The 29-item Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton et al., 2000) was used to assess athletes’ perceptions of the motivational climate



typically experienced on their teams. The PMCSQ-2 is hierarchical in structure and includes two higher order dimensions: the perceived task-involving climate and the perceived ego-involving climate. Each contains three first-order subdimensions. In the case of the task-involving climate scale these are, cooperative learning, (e.g., “The coach encourages players to help each other”), effort and improvement (e.g., “Players are encouraged to work on their weaknesses”), and important role (e.g., “Each player has an important role”). The ego-involving climate scale comprises three subdimensions: intrateam member rivalry (e.g., “Players are encouraged to outplay the other teammates”), unequal recognition (e.g., “The coach has his/her own favourites”), and punishment for mistakes (e.g., “The coach gets mad when a player makes a mistake”). Responses were reported on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5). The internal consistency of the scale with this sample was as follows: .78 for effort and improvement, .80 for important role, .82 for co-operative learning, .80 for punishment for mistakes, .83 for unequal recognition, and .56 for intrateam member rivalry. Although, the items in the intrateam rivalry subscale were less internally consistent, supporting previous findings (see also Newton et al., 2000), this subscale was retained in the analyses for the sake of completeness.

Despite evidence of the factorial validity of the PMCSQ-2 (see e.g., Newton et al., 2000), the scale was subjected to CFA with this sample using EQS 5.7b (Bentler, 1995). The testing of the hierarchical, second order factor structure whereby the task- and the ego-involving climates served as the correlated higher order factors of the six subscales, resulted in goodness of fit indices that were marginally acceptable [robust CFI=.89, NNFI = .88, SRMR = .07]. The covariance between the higher order factors of task- and ego-involving climates was -.33, and the loadings of the subscales onto the higher order factors ranged from .76–.98, whereas the loadings of their designated items ranged from .47–.78. All factor loadings were statistically significant.

## Results

### Descriptive Statistics

Table 1 presents means and standard deviations, as well as a summary of the internal consistency scores for all the main variables in the study. Mean scores were above the midpoint for the 3 Cs (direct and meta-perceptions) and for the task-involving climate variables. For the ego-involving climate variables, the mean scores were closer to the midpoint. Table 2 presents simple bivariate correlations which were computed to assess the degree and the direction of the relationship between the CART-Q direct and meta-perceptions subscales and the subscales of the PMCSQ-2. Statistically significant correlation coefficients among the subscales of the PMCSQ-2 and the subscales of the CART-Q were found. The direction of the correlations were as expected; in general terms, scores on the subscales of the CART-Q were positively associated with the task-involving subscales and negatively associated with the ego-involving subscales of the PMCSQ-2. It was noticeable, however, the intrateam member rivalry subscale did not significantly correlate with any of the CART-Q subscales and that the correlations observed between punishment for mistakes, unequal recognition and the CART-Q subscales were weak.

**Table 1 Means and Standard Deviations for the Whole Sample**

	Response Scale	Alpha	<i>M</i>	<i>SD</i>
CART-Q (direct)				
Closeness	1–7	.89	5.60	1.11
Commitment	1–7	.80	4.90	1.17
Complementarity	1–7	.85	5.44	1.04
CART-Q (meta)				
Meta-closeness	1–7	.87	5.11	1.00
Meta-commitment	1–7	.77	4.69	1.08
Meta-complementarity	1–7	.87	5.19	.96
PMCSQ-2				
Punishment	1–5	.80	2.59	.77
Unequal recognition	1–5	.87	2.77	.81
Intrateam member rivalry	1–5	.56	2.97	.76
Important role	1–5	.80	3.97	.65
Cooperative learning	1–5	.79	4.02	.66
Effort/improvement	1–5	.80	4.08	.50

Note. *N* = 592

## Canonical Correlation Analysis

Canonical correlation analysis was conducted to examine the association among the targeted features of the coach-athlete relationship and the coach-created motivational climate. This type of analysis examines the relationship between *two sets* of variables by testing how the subscales of athletes' direct and meta-perceptions of closeness, commitment, and complementarity relate to the dimensions of the task- and ego-involving climates. Such an examination can supply information about what facets of the social contexts are related and how much variance is shared. In the first set of analyses, the task-involving (important role, co-operative learning, and effort/improvement) and ego-involving climate (unequal recognition, punishment for mistakes, and intrateam member rivalry) subscales of the PMCSQ-2 comprised the dependent variable set and the direct perception subscales of the CART-Q comprised the covariate set. In the second set of analyses, the task-involving and ego-involving subscales of the PMCSQ-2 comprised the dependent variable set and the subscales of the meta-perception subscales of the CART-Q comprised the covariate set. Detailed results from these analyses are presented in Table 3.

In canonical correlation analysis, three assessments of variance are usually reported (see Tabachnick & Fidell, 1996). First, the assessment of squared canonical correlation ( $R^2$ ) represents the variance overlap or association between each significant set of canonical variate pairs of the motivational climate and the coach-athlete relationship (direct and meta-perceptions) dimensions. Second, the sum of squared loadings on a variate divided by the number of variables in the set represents the variance extracted by a canonical variate from its own set of variables (shared variance). Thirdly, the index of redundancy describes the proportion of

**Table 2 Bivariate Correlations For All Variables**

Variables	1	2	3	4	5	6	7	8	9	10	11	12
Relationship												
1. Closeness	1	.76*	.85*	.69*	.57*	.67*	-.15*	-.22*	.01	.42*	.44*	.49*
2. Commitment		1	.72*	.66*	.74*	.63*	-.06	-.19*	.04	.42*	.39*	.47*
3. Complementarity			1	.71*	.58*	.75*	-.16*	-.17*	.04	.39*	.42*	.46*
4. Meta-closeness				1	.77*	.87*	-.12*	-.20*	.02	.41*	.42*	.42*
5. Meta-commitment					1	.72*	-.06	-.17*	.03	.38*	.34*	.36*
6. Meta-complementarity						1	-.16*	-.18*	.03	.41*	.41*	.43*
Motivational Climate												
7. Punishment for mistakes							1	.64*	.47*	-.20*	-.08	-.14*
8. Unequal recognition								1	.52*	-.40*	-.22*	-.26*
9. Intra-team member rivalry									1	-.10	.05	-.02
10. Important role										1	.63*	.65*
11. Cooperative learning											1	.72*
12. Effort/improvement												1

\*Correlation is significant at the 0.01 level (2-tailed)

**Table 3** Canonical Correlations for the Coach-Athlete Relationship and the Motivational Climate Variables

	CART-Q Direct & PMCSQ-2	CART-Q Meta & PMCSQ-2
Covariate Set		
Closeness	.97	.96
Commitment	.89	.82
Complementarity	.94	.97
<i>Percent of variance (shared variance)</i>	84%	84%
<i>Redundancy</i>	25%	21%
<i>R<sup>2</sup></i>	30%	25%
Dependent Set		
Punishment	-.24	-.28
Unequal recognition.	-.39	-.39
Intrateam rivalry	-.05	-.05
Important role	.94	.86
Cooperative learning	.82	.85
Effort/Improvement	.89	.88
<i>Percent of variance (shared variance)</i>	40%	41%
<i>Redundancy</i>	12%	10%

Note.  $N = 591$

variance of the variables of one set that is accounted for by the linear combination of the other set.

**Direct Perceptions of the Relationship With the Coach.** One statistically significant canonical correlation function emerged for the direct perceptions of the coach-athlete relationship and the motivational climate set, Wilks's  $\Lambda = .66$ ,  $F(18, 1646.63) = 14.49$ ,  $p < .00$ ; canonical correlation was .55. The amount of variance accounted for by the two pairs of canonical variates, or the overall variance ( $R^2$ ) that the solution extracted from the canonical variates, was 30%. Thus, the first pair of canonical variates accounted for 32% of the variance between the linear composites of the coach-athlete relationship and the motivational climate. Moreover, for the coach-athlete relationship variables, the first canonical variate accounted for 84% of the variance in that set, while the redundancy value was 25%. The first canonical variate accounted for 40% of the variance in the subscales of the task- and ego-involving climates while the redundancy was 12% (see Table 3).

Based on the cut-off correlation of .30 (see Tabachnick & Fidell, 1996), the direct perceptions variables in the coach-athlete relationship set correlated positively with the task-involving climate subscales and negatively with the ego-involving climate subscales (with the exception of the punishment for mistakes and the intrateam member rivalry subscales; see Table 3).

**Meta-Perceptions of the Relationship With the Coach.** One statistically significant canonical correlation function emerged for the meta-perceptions of the coach-athlete relationship and motivational climate set, Wilks's  $\Lambda = .72$ ,  $F(18, 1646.63) = 11.26$ ,  $p < .001$ , and the reported value for the canonical correlation was .50. The overall variance ( $R^2$ ) that the solution extracted from the canonical variates was 25%. For the coach-athlete relationship variables, the first canonical variate accounted for 84% of the variance in that set and the redundancy was 21%. The first canonical variate accounted for 41% of the variance in the subscales of the task- and ego involving climates while the redundancy was 10% (see Table 3).

Overall, the variables in the meta coach-athlete relationship variables set correlated positively with the task involving climate subscales and negatively with the unequal recognition subscale of the ego-involving climate; neither punishment nor intrateam member rivalry correlated sufficiently with any of the relationship variables.

## Discussion

The present study demonstrates that the dimensions of the coach-created motivational climate and features of the quality of the coach-athlete relationship are associated in a conceptually coherent manner. The results from the canonical correlation analysis showed that athletes' direct and meta-perceptions of their relationship with the coach were highly associated with the perceived coach-created motivational climate. A close inspection of the variance overlap between each significant set of canonical variate pairs, where dimensions of the motivational climate and coach-athlete relationship were included, indicated a relatively large association (up to 30%). Moreover, the significant variance extracted by the canonical variate from within each set of variables (i.e., for the direct and meta-perceptions of the coach-athlete relationship was 84% and for the motivational climate variance ranged from 40% to 41%) coupled with reasonable redundancy indices, indicated that the motivational climate and the coach-athlete relationship are meaningfully related constructs for athletes who participate in team sports. From these findings, it is possible to conclude that just like the concept of coach leadership (e.g., Balaguer et al., 2002; Smith et al., 2005), the coach-athlete relationship has motivational significance as reflected in its links with the task- and ego-involving features of the coach-created motivational climate. The results also suggest that athletes' overall views of the coach-created motivational climate operating on their team are associated with specific features of their perceived interpersonal relationship with their coach.

Findings highlighted that the perceived task-involving coach climate (i.e., important role, co-operative learning, and effort improvement) was associated with athletes' perceptions of feeling close, being committed, and interacting in a complementary fashion with their coach (i.e., direct relationship variables). Moreover, the present findings indicated that athletes who perceived the coach climate as task-involving (i.e., important role, co-operative learning, and effort improvement), were more likely to believe that their coaches experienced greater levels of closeness, commitment, and complementarity (i.e., meta-relationship variables) relative to themselves. While the perceived ego-involving coach climate features

of punishment for mistakes and intrateam member rivalry were unrelated to both direct and meta-relationship variables, athletes' perceptions of unequal recognition were associated with their own and their coaches' views that the relationship lacks in closeness, commitment, and complementarity (i.e., direct and meta relationship variables). Collectively, these findings suggest that athletes believe that not only the relationship with their coach but also the relationship their coaches hold with them correspond to their views of how task- and ego-involving the atmosphere is that the coach creates on his or her team.

Several limitations of this study should be noted. Although the current study sampled athletes from a variety of performance levels and a variety of team sports, not all performance levels and sports were equally represented. Moreover, athletes responded to the assessments employed at different points in their season (e.g., pre, mid, postseason) and the amount of time they trained varied. Such situational factors as well as individual difference characteristics could potentially alter the strength and pattern of the associations reported in this study between the coach-athlete relationship and the coach-created motivational climate. These are important considerations that need to be carefully examined in future research studies.

The cross-sectional nature of the study does not allow to draw inferences of causation (e.g., does the perceived coach-created motivational climate influence the coach-athlete relationship or vice versa). Longitudinal research studies would help elucidate the causal nature of the associations between the dimensions of the coach-created motivational climate and features of the quality of the coach-athlete relationship. It is possible that throughout one or more seasons, athletes' perceptions of the relationship with their coach fluctuate in intensity and direction. Similarly, perceptions of the coach-created climate and the coach-athlete relationship may change over time in an interdependent fashion over time. Thus, an examination of dimensions of the coach-athlete relationship and the motivational climate across time would provide important knowledge and understanding of possible causal links and patterns of change. However, researchers should be mindful that although longitudinal studies provide insight into the direction of causality, they do not provide evidence of cause and effect.

To date, all of the studies investigating coach-athlete relationships have assumed that the trajectory, life-cycle or course of the coach-athlete relationship is linear. This assumed linearity implies that the quality of the coach-athlete relationship becomes increasingly interdependent or stronger over time (i.e., more close, committed, and complementary). However, the relationship quality may plateau and/or start to decline at some point of the life-cycle of the coach-athlete relationship. This may occur in instances when the coach has nothing more to offer to the athlete, or the athlete feels that his/her athletic career has come to a halt due to injury, performance slumps, or burnout. Thus, it is proposed that possible nonlinear trends are considered in the coach-athlete relationship alongside their potential implications to athletes' views regarding the motivational climate manifested on their team.

This study was guided by Nicholl's Achievement Goal Theory (AGT) and Duda and Balaguer's (1999) integrated model of coach leadership and motivational climate. Consequently, our research was grounded in the two-dimensional conceptualization of task and ego features of achievement motivation, both of which reflect an approach tendency (see Duda, 2007). Future research should

examine whether there are avoidance aspects of the coach-created motivational climate (see Elliot & Conroy, 2005) and how these relate to the dimensions of the coach-athlete relationship (see Adie & Jowett, 2008).

Overall, the finding that aspects of the interpersonal relationship between coaches and their athletes are aligned with athletes' views of the motivational features of the coach-created environment in which they train and compete suggests that athletes' perceptions of the coach-athlete relationship have motivational significance. Our results support the contention that the athletic partnership is a medium from which athletes' needs are expressed and fulfilled (see e.g., Jowett, & Poczwadowski, 2007). Subsequently, the inclusion of the concept of the coach-athlete relationship in Duda and Balaguer's model appears justifiable (see Figure 1 in bold). More work pulling from this extended model is warranted as such research would supply invaluable information to coaches interested in creating athletic partnerships and motivational climates that translate into positive implications for their athletes' development.

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### References

- Adie, J., & Jowett, S. (2008). Athletes' meta-perceptions of the coach-athlete relationship, multiple achievement goals and intrinsic motivation among track and field athletes. *Manuscript under review*.
- Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G.C. Roberts (Ed.), *Motivation in Sport and Exercise* (pp. 161–176). Champaign, IL: Human Kinetics.
- Balaguer, I., Duda, J.L., Atienza, F.L., & Mayo, C. (2002). Situational and dispositional goals as predictors of perceptions of individual and team improvement, satisfaction and coach ratings among elite female handball teams. *Psychology of Sport and Exercise*, 3, 293–308.
- Balaguer, I., Duda, J.L., & Crespo, M. (1999). Motivational climate and goal orientations as predictors of perceptions of improvement, satisfaction and coach ratings among tennis players. *Scandinavian Journal of Medicine & Science in Sports*, 9, 381–388.
- Balaguer, I., Duda, J.L., & Mayo, C. (1997). The relationship of goal orientation and the perceived motivational climate to coaches' leadership style in competitive handball. In *Innovations in sport psychology: linking theory and practice: proceedings*, Netanya (Israel), The Zinman College of Physical Education and Sport Sciences, The Wingate Institute for Physical Education and Sport, pp. 94–96. Israel.
- Baldwin, M.W. (Ed.). (2005). *Interpersonal cognition*. London: Guilford.
- Bentler, P.M. (1995). *EQS: Structural equations program manual*. Encino, CA: Multivariate Software, Inc.
- Carron, A.V., Brawley, L.R., & Widmeyer, W.N. (1990). The impact of group size in an exercise setting. *Journal of Sport & Exercise Psychology*, 12(4), 376–387.

- Chelladurai, P. (1984). Discrepancy between preferences and perceptions of leadership behavior and satisfaction of athletes in varying sports. *Journal of Sport Psychology*, 6, 27–41.
- Chelladurai, P. (1993). Leadership. In R.N. Singer, M. Murphey, & L.K. Tennant (Eds.), *Handbook on research on sport psychology* (pp. 647–671). New York: Macmillan.
- Chelladurai, P., & Riemer, H.A. (1998). Measurement of leadership in sport. In J.L. Duda (Ed.), *Advances in sport and exercise psychology measurement* (pp. 227–253). Morgantown, WV: Fitness Information Technology.
- Duda, J.L. (2001). Goal perspectives research in sport: Pushing the boundaries and clarifying some misunderstandings. In G.C. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 129–182). Champaign, IL: Human Kinetics.
- Duda, J.L., & Balaguer, I. (1999). Toward an integration of models of leadership with a contemporary theory of motivation. In R. Lidor & M. Bar-Eli (Eds.), *Sport psychology: Linking theory and practice* (pp. 213–229). Morgantown, WV: Fitness Information Technology.
- Duda, J.L., & Balaguer, I. (2007). Coach-created motivational climate. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 117–130). Champaign, IL: Human Kinetics.
- Elliot, A.J., & Conroy, D.E. (2005). Beyond the dichotomous model of achievement goals in sport and exercise psychology. *Sport and Exercise Psychology Review*, 1, 17–25.
- Hu, L., & Bentler, P.M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Jones, R.L., Glimtmyer, N., & McKenzie, A. (2005). Slim bodies, eating disorders and the coach-athlete relationship. *International Review for the Sociology of Sport*, 40, 377–391.
- Jowett, S. (2005). On enhancing and repairing the coach-athlete relationship. In S. Jowett & M. Jones (Eds.), *The psychology of coaching. Sport and Exercise Psychology Division*. Leicester: The British Psychological Society.
- Jowett, S. (2007a). Coach-athlete relationships ignite groupness. In M. Beauchamp & M. Eys (Eds.), *Group Dynamics: Advances in Sport and Exercise Psychology*. New York: Routledge.
- Jowett, S. (2007b). Factor Structure and Criterion Validity of the Meta-Perspective Version of the Coach-Athlete Relationship Questionnaire (CART-Q). *Manuscript under review*.
- Jowett, S. (2007c). Interdependence analysis and the 3 + 1Cs in the coach-athlete relationship. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 15–27). Champaign, IL: Human Kinetics.
- Jowett, S. (2008). Moderators and mediators of the association between the coach-athlete relationship and physical self-concept. *International Journal of Coaching Science*, 2, 43–62.
- Jowett, S. (in press). Validating coach-athlete relationship measures with the nomological network. *Measurement in Physical Education and Exercise Science*.
- Jowett, S., & Chaundy, V. (2004). An investigation into the impact of coach leadership and coach-athlete relationship on group cohesion. *Group Dynamics: Theory, Research and Practice*, 8, 302–311.
- Jowett, S., & Clark-Carter, D. (2006). Perceptions of empathic accuracy and assumed similarity in the coach-athlete relationship. *The British Journal of Social Psychology*, 45, 617–637.
- Jowett, S., & Don Carolis, G. (July, 2003). *The coach-athlete relationship* and perceived satisfaction in team sports. 11th World Congress of Sport Psychology. Copenhagen, Denmark.



- Jowett, S., & Ntoumanis, N. (2004). The Coach-Athlete Relationship Questionnaire (CART – Q): Development and initial validation. *Scandinavian Journal of Medicine & Science in Sports*, *14*, 245–257.
- Jowett, S., Paull, G., & Pensgaard, A.M. (2005). Coach-athlete relationship. In J. Taylor & G. S. Wilson, *Applying Sport Psychology: Four Perspectives* (pp. 153-170). Champaign, IL: Human Kinetics.
- Jowett, S., & Poczwadowski, A. (2007). Understanding the coach-athlete relationship. In S. Jowett & D. Lavallee (Eds.), *Social psychology in sport* (pp. 3–14). Champaign, IL: Human Kinetics.
- Kenny, D.A. (1994). *Interpersonal perception: A social relations analysis*. New York: Guilford Press.
- Kenow, L.J., & Williams, J.M. (1992). Relationship between anxiety, direct confidence, and evaluation of coaching behaviors. *The Sport Psychologist*, *6*, 344–357.
- Laing, R.D., Phillipson, H., & Lee, A.R. (1966). *Interpersonal Perception*. Baltimore: Perennial Library.
- Mageau, G.A., & Vallerand, R.J. (2003). The coach-athlete relationship: A motivational model. *Journal of Sports Sciences*, *21*, 883–904.
- Miller, B.W., Roberts, G.C., & Ommundsen, Y. (2005). Effect of perceived motivational climate on moral functioning, team moral atmosphere perceptions, and the legitimacy of intentionally injurious acts among competitive youth football players. *Psychology of Sport and Exercise*, *6*, 461–477.
- Newcomb, T.M. (1953). An approach to the study of communicative acts. *Psychological Review*, *60*, 393–404.
- Newton, M., Duda, J.L., & Yin, Z. (2000). Examination of the psychometric properties of the Perceived Motivational Climate in Sport Questionnaire-2 in a sample of female athletes. *Journal of Sports Sciences*, *18*, 275–290.
- Nicholls, J.G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.
- Riemer, H.A. (2007). Multidimensional model of coach leadership. In S. Jowett, & D. Lavallee (Eds.), *Social psychology in sport* (pp., 57-74). Champaign, IL: Human Kinetics.
- Riemer, H.A., & Toon, K. (2001). Leadership and satisfaction in tennis: Examination of congruence, gender and ability. *Research Quarterly for Exercise and Sport*, *72*, 243–256.
- Smith, S.L., & Smoll, F. L. (2007). Social-cognitive approach to coaching behaviors. In S. Jowett, & D. Lavallee (Eds.), *Social psychology in sport* (pp. 75-90). Champaign, IL: Human Kinetics.
- Smith, S.L., Fry, M.D., Ethington, C.A., & Li, Y. (2005). The effect of female athletes' perceptions of their coaches' behaviors on their perceptions of the motivational climate. *Journal of Applied Sport Psychology*, *17*, 170–177.
- Smith, R.E., Zane, N.W.S., Smoll, F.L., & Coppel, D.B. (1983). Behavioral assessment in youth sports: Coaching behaviors and children's attitudes. *Medicine and Science in Sports and Exercise*, *15*, 208–214.
- Smoll, F.L., & Smith, R.E. (1989). Leadership behaviors in sport: A theoretical model and research paradigm. *Journal of Applied Social Psychology*, *19*, 1522–1551.
- Tabachnick, B.G., & Fidell, L.S. (1996). *Using multivariate statistics* (3rd ed.). New York: HarperCollins.