ACHIEVEMENT MOTIVATION IN TRAINING AND COMPETITION: DOES THE CONTEXT MATTER?

By

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Abstract

The aim of this thesis was to examine the influence of training and competition on achievement motivation, specifically on: (a) achievement goals and perceived motivational climate; and (b) on the relationships between goals, perceived climate, and outcomes such as effort, enjoyment, tension, psychological skills and performance. Study one addressed these purposes in tennis and study two in football; study three extended the findings to a wide variety of sports, and study four to an experimental training and competition of a golf-putting task.

In general, the findings indicate that ego orientation and perceived performance climate tend to be higher in competition than in training. Task orientation showed a propensity to be higher in training than in competition, whereas perceived mastery climate appeared to be more stable across the two contexts. A task goal emerged as the most adaptive goal in both contexts, whereas an ego goal was found to be associated with additional benefits in competition, such as higher effort. Sport type (i.e., individual vs. team sports) influenced these relationships, but only in competition. Overall, these findings suggest that the distinction between training and competition contexts is a valuable one and should be considered when examining achievement motivation in sport.

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LIST OF PAPERS

The present thesis comprises the following four papers:

van de Pol, P. K. C., & Kavussanu, M. (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise, 12*, 176–183. doi: 10.1016/j.psychsport.2010.09.005

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In addition, data from the current thesis resulted in the following conference abstracts:

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CHAPTER ONE

GENERAL INTRODUCTION

Motivation in Sport

Motivation is one of the most popular research topics in sport psychology, and the reason for this may be that it has been continually reported as an important factor in affecting people's well-being and performance in sport (Roberts, Treasure, & Conroy, 2007; Vallerand, 2007). A contemporary approach to the study of motivation is to consider it as a cognitive *process* (Roberts et al., 2007; Weiss & Ferrer-Caja, 2002). More specifically, Roberts and colleagues (2007) argue that to understand motivation, it is important to examine the processes that energize, direct, and regulate achievement behaviour. To date, sport motivation research is strongly positioned within a social-cognitive framework, according to which, individuals cognitively process and develop their views about achievement in relation to social contexts and influences (Ntoumanis & Biddle, 1999; Roberts et al., 2007).

Training and Competition

The sport domain can be subdivided into two core achievement contexts: *Training* and *Competition*. The training context takes a central place in athletes' sport lives as this is the environment where they spend a vast amount of time; for example, research has shown that elite athletes spend on average 13 years or 4,000 hours on concentrated sport-specific practice, of which the vast majority in *organised* training (Baker, Côté, & Abernethy, 2003a, 2003b). Organised training does not only provide opportunities for athletes to develop sport-specific skills, such as concentration and dealing with pressure, but also more broader life skills such as self-confidence and self-regulated behaviours like taking responsibility for learning (Côté, Baker, & Abernethy, 2007; Hays, Maynard, Thomas, & Bawden, 2007; Toering, Elferink-Gemser, Jordet, Jorna, Pepping, & Visscher, 2011). Thus, training is essential for developing skills, and - when organised appropriately (e.g., safe; clear expectations regarding training demands) - it can play an important role in positive youth development (Côté et al., 2007; Strachan, Côté, & Deakin, 2011).

Competition is an integral part and defining feature of sport (Duda & Nicholls, 1992; Vansteenkiste & Deci, 2003). As an *organised* structure, competition has been described as a context in which individuals work against each other toward a goal or reward that only one or a few can attain (Ames & Ames, 1984; Stanne, Johnson, & Johnson, 1999). Hence, a central feature of competition is its 'negative outcome interdependence', which means that people can only reach their goal at expense of others, and which is the origin of an ongoing debate on the value of competition (cf. Stanne et al., 1999). Proponents of competition advocate that competitive experiences are healthy because they help young people to deal with a competitive society, and specifically in sport, they bring out the best in individuals' performance. Others claim that competition may foster insecurity, envy and aggression, and creates stress thereby impairing performance (see for a discussion: Kohn, 1992; Stanne et al., 1999). Despite its controversial nature, competition has been reported as a key motive for sport participation (e.g., Kilpatrick, Hebert, & Bartholomew, 2005).

Contextual Motivation and Training and Competition

A social-cognitive view of motivation suggests that motivation is a construct that is influenced by both personal *and* contextual factors. From this perspective, a person is regarded as an active perceiver and an intentional behaver, who acts in accord with a constructed view of the social context (Deci & Ryan, 1987). Deci and Ryan (1987) have also argued that the contextual influence on an individual's motivation may depend on its 'functional value', which refers to the motivationally relevant psychological meaning that contexts are afforded or imbued with. Accordingly, depending on the perceived functional value of a context, people can *orient* their motivation toward a context by selectively attending to salient factors in this context (Deci & Ryan, 1987). An important factor that determines this functional value - and thereby could set context-specific motivation in motion - is the (prevailing) reward structure, which refers to the objective criteria by which people are

rewarded in an achievement context (Ames & Ames, 1984). This perspective of motivation is important when considering that the different characteristics of training and competition may involve different reward structures and may lead to context-specific motivational processes.

In training, the reward structure is primarily determined by the coach, for example, by how training activities are organised and the type of feedback and instructions given to athletes. Hence, a good indicator of the reward structure of training is the value that coaches place on behaviours and attitudes of athletes in this context (cf. Ames & Ames, 1984). A recent study (Oliver, Hardy, & Markland, 2010) explored which specific training behaviours were valued by coaches as important for athletes' development. Examples were: self-motivation to learn and progress, willingness to undertake extra training, coping with success for continued progression, seeking information to improve, and concentrating when listening to instructions. Other research also suggests that coaches actually focus on such behaviours which facilitate athletes' skill acquisition and progression (Côté et al., 2007; Côté, Salmela, & Russell, 1995). Thus, research suggests that coaches value - and focus on - behaviours in training which facilitate *skill development*; hence, this should influence the reward structure and the functional value athletes attribute to training (cf. Ames & Ames, 1984).

The reward structure in organised competition is strongly determined by its *formal* structure. Although each competition may differently emphasize the degree of normative outcome interdependence, according to Johnson and Johnson (1989) each competition also includes some basic elements, which are: perceived scarcity (what is wanted is limited; e.g., there is only one winner), an inherent outcome uncertainty due to a focus on the relative performance of the opponent(s), and forced social comparison. Although to a less extent than in training (cf. Côté et al., 1995; Horn, 1985), the coach may also influence the reward structure in competition. However, the coach may use more evaluative and less instructive rewards in competition than in training (Horn, 1985). Thus, competition typically emphasizes

social evaluation, which may affect the functional value athletes attribute to this context and accordingly their motivational orientation (cf. Ames & Ames, 1984).

In sum, as organised structures, training and competition may influence athletes' achievement motivation. Central to this premise is the assumption that both contextual and individual-difference factors are involved in this process. From this perspective, the focus will now turn on the theoretical framework that was adopted in this thesis to examine achievement motivation across training and competition.

Achievement Goal Theory

A social-cognitive framework which may help to understand the motivational processes within and across training and competition is achievement goal theory. Over the last three decades, achievement goal theory has become one of the main paradigm for motivational research in sport, and is primarily based on the work of Ames (e.g., 1992a, 1992b), Dweck, (e.g., 1986), Elliot (e.g., 1997), Nicholls (e.g., 1984, 1989), and Maehr (e.g., 1987). Although these contributions have each their own terminology and conceptual nuances, a central principle they share is that people engage in achievement contexts in order to develop or demonstrate competence (Duda, 1992).

Achievement goals. According to Nicholls (1984, 1989), people can evaluate their own competence or ability by using self or other-referenced criteria, which forms the basis of two different achievement goals, namely *task* and *ego involvement* (Nicholls, 1984, 1989). When people are task involved, they evaluate competence using self-referenced criteria and feel successful when they learn something new, master a task, or improve their skills. In contrast, when people are ego involved, they evaluate competence using other-referenced criteria and feel successful when they establish superiority over others (Nicholls, 1989). People have a proneness to the two types of involvement which are known as task and ego goal *orientations* (Nicholls, 1989). Task and ego goals have been found to be relatively orthogonal (e.g.,

Roberts, Treasure, & Kavussanu, 1996), which implies that people can be high or low in either or both goals, and moreover, different combinations in the levels of these two goals may lead to different outcomes. This possibility of multiple goal endorsement requires that both goals are examined simultaneously and should be tested on their interactive effects in predicting achievement outcomes (Harackiewicz, Barron, & Elliot, 1998).

Goals and levels of analysis. The goal construct can be examined at different *levels of analysis* (cf. Duda, 2001; Spray & Keegan, 2005). Nicholls' (1989) conceptualization of achievement goals distinguishes two levels of analysis: 'goal involvement', which refers to situational goal states, and 'goal orientation', which refers to an individual's disposition. This is important when considering that there is some discrepancy across theories in the way the goals are conceptualized with respect to the level of analysis. For example, more recently, researchers (e.g., Elliot, 1997; Elliot & McGregor, 2001) have advocated a goal model which incorporates both an individual's definition of competence (i.e., mastery vs. performance) and the valence of her/his competence (i.e., approaching competence vs. avoiding incompetence), resulting in four distinct achievement goals: mastery-approach (like task), mastery-avoidance, performance-approach (like ego), and performance-avoidance goals (Conroy, Elliot, & Coatsworth, 2007). However this goal concept (Elliot, 1997) does not acknowledge the two separate levels of analysis: goal *orientation* and goal *involvement*; instead, these goals are conceptualised as a 'mid-level' construct that occupies the conceptual space between more dispositional goals and state goals (Pintrich, Conley, & Kempler, 2003; Roberts et al., 2007).

This is a vital point, as potential contextual influences on achievement goals may depend on the level of analysis of the goal construct (cf. Duda, 2001). Duda (2001) has argued that there may be three different levels of analysis in the goal construct: (1) individual differences in goal perspective or dispositional goal orientations; (2) goals which refer to appraisals of competence with reference to a specific event, which is a type of "state" goal

orientation; and (3) task and ego involvement processing states. As goal orientations are an expression of a proneness to (i.e., how individuals *usually*) evaluate success in a particular achievement context, they are, arguably, more consistent across contexts than appraisals of competence with reference to a specific event (i.e., a type of "state" goal orientation, Duda, 2001), as the latter goal construct may be more susceptible to vary, for example, due to the experienced intensity of an event (e.g., a promotion game versus a friendly game). Finally, the construct of (strict) goal involvement, which refers to processing states, arguably, goes beyond the discussion of contextual stability as these momentary states are assumed to fluctuate during an event (cf. Duda, 2001). Thus, the contextual consistency of achievement goals should depend on the employed level of analysis of the goal construct. Therefore, when examining and interpreting contextual variation in goals it is important to avoid ambiguity whether goal orientations or a 'semblance' of goal involvement (i.e., appraisals of competence with reference to a specific event / "state" goal orientation) is measured (Duda, 2001). To acknowledge this, and thereby avoiding ambiguity in interpretations, Nicholls' (1989) goal concept is adopted throughout this thesis, as it allows to distinguish different (dispositional and situation-specific) levels of analysis in the goal construct.

This also implies that a 'dichotomous' framework is adopted, thereby explicitly focusing on task and ego goals (and *not* include the valence - approach/avoidance - dimension). Beyond the argument that this framework (Nicholls, 1989) acknowledges different levels of analysis, focusing on task and ego goals in this thesis is considered as most appropriate as a salient difference between the two contexts may be the focus on personal skill development in training versus normative evaluation in competition. Hence, the distinction between self versus other-referenced criteria for success embedded in task and ego goals, respectively, may bring potential differences in motivation across the two contexts most strongly to the surface.

Goals in training and competition. As organised structures, training and competition may involve different reward structures which could differentially promote task or ego involvement: Training typically provides athletes opportunities to practise and develop their skills, whereas organised competition is formally regulated as a test of skills evaluated by normative criteria. Normative comparison may also take place in training (e.g., competition simulation drills), however, it is *inherent* in competition because in this context it is objectively rewarded (e.g., normative rankings based on win/loss records). Hence, the structural characteristics of training and competition may influence the extent to which athletes adopt task and ego involvement in each context; this may also lead them to develop the *tendency* to evaluate success specific to each context. Thus, people may have a disposition to a certain goal; however, contextual experiences may influence people's conceptions of ability/competence, which may give goal orientations the potential to vary across contexts (cf. Kaplan & Maehr, 2007).

To date, very few studies have examined achievement goals across training and competition. In one study, female softball players were more task involved before a training session than before a competitive game, but did not differ in ego involvement (Williams, 1998). Similarly, athletes - from an unspecified sport - reported higher task orientation in training than in competition but no difference in ego orientation (Tammen, 1998).

Motivational climate. Another construct in achievement goal theory is the *motivational climate*, which refers to the situational goal structure operating in an achievement context, and has been distinguished in *mastery climate,* where the emphasis is on effort, personal improvement, and skill development, and *performance climate,* where the emphasis is on normative comparison and public evaluation (Ames, 1992b).

Ames (1992b) has emphasized that in order to predict cognitions, affect and behaviour, it is necessary to attend to how individuals subjectively value, or *perceive* the motivational

climate. The motivational climate is created by significant others, such as teachers, parents and coaches (Ames, 1992a); evidently, in sport the coach is the central architect in structuring the motivational climate. An interesting thought, recently forwarded by Harwood, Spray and Keegan (2008) is that, just as the goals, perceptions of the climate may also be orthogonal, which suggests that athletes may simultaneously perceive mastery and performance cues in the way they 'generally' perceive the climate (cf. Goudas & Biddle, 1994). For example, athletes may perceive that their coach generally emphasizes effort to improve (i.e., a mastery cue) but also that he/she tends to be punitive when mistakes are made (i.e., a performance cue). This suggests the value to also test whether the two climates interact with each other in predicting achievement outcomes. Finally, similar to the goals, the motivational climate can also be examined at different levels of analysis (cf. Harwood et al., 2008): At a more broad level, for example, how athletes *generally* perceive the coach-created climate in training or competition, or at a *situation-specific* level, for example, how athletes perceive the climate in one specific training or competition. As each level of assessment answers a different question it is important to consider this when examining perceptions of the motivational climate across different contexts.

Motivational climate in training and competition. Training and competition may also influence athletes' perceptions of the motivational climate. The emphasis on normative success in competition, such as normative ranking systems based on win/loss records, may lead coaches to put more emphasis on these criteria in this context, thereby creating a higher performance climate in competition than in training. Perceptions of a mastery climate may be more stable between the two contexts as coaches should reward effort and encourage personal (performance) improvement in both contexts. So far, no study has investigated whether perceived motivational climate varies between the training and competition contexts. However, findings of a study that examined tennis players' perceived motivational climate in

the general context of sport and in a specific competition match, indicate that - although not statistically compared - athletes may perceive the climate in competition (M = 5.05) more performance/ego oriented than the climate they generally perceive in their sport (M = 2.89), while a perceived mastery/task climate appeared to be more consistent (climate in competition, M = 8.08 vs. climate with reference to sport in general, M = 8.42) across these two levels of the climate (Cervelló, Santos-Rosa, Calvo, Jiménez, & Iglesias, 2007). Thus, there may be value in examining the motivational climate across training and competition.

Goals, Climate and Achievement Outcomes. Goals and perceptions of the climate may influence cognitive, affective and behavioural achievement responses (Ames, 1992b; Dweck, 1986; Nicholls, 1989). Previous research has provided evidence that goals and perceived motivational climate have implications for a wide variety of achievement responses in sport (see for reviews: Biddle, Wang, Kavussanu, & Spray, 2003; Harwood et al., 2008; Ntoumanis & Biddle, 1999). A set of responses/outcomes which may provide a good representation of important cognitive, affective and behavioural responses in sport, are effort, enjoyment/interest, tension and trait anxiety, psychological skills, and performance.

Effort is an indicator of motivation (Gill, 1986; Duda, 1992; Lochbaum & Roberts, 1993). The importance of effort in learning processes is expressed by Ames and Archer (1988) who viewed the attainment of mastery as dependent on effort. Moreover, effort has also been shown to play an important role in facilitating performance (e.g., Cooke, Kavussanu, McIntyre, & Ring, 2011). *Enjoyment/interest* is the principal indicator of intrinsic motivation, which refers to performing an activity for its own sake and the pleasure and satisfaction derived from participation, and has been associated with high-quality performance in sport (Deci, 1971; Ryan & Deci, 2000; Vallerand, 2007). *Trait anxiety* and *tension* are generally considered as maladaptive factors in sport. Trait anxiety is a predisposition to experience stress and (state) anxiety in challenging or threatening situations

(cf. Smith, Smoll, Cumming, & Grossbard, 2006). Individuals high in trait anxiety may become preoccupied with distressful emotions or have a tendency to disengage from their goals (cf. Giacobbi & Weinberg, 2000). Tension, which is considered to be an expression of trait anxiety (Martens, 1977), is generally regarded as an indicator of low intrinsic motivation (Deci & Ryan, 1985; Ryan & Deci, 2000).

Psychological skill use is another important variable in achievement. Psychological skills refer to techniques and strategies, such as goal setting, self-talk, and attentional control, which may facilitate *performance* (e.g., Thomas, Murphy, & Hardy, 1999; Smith, Schutz, Smoll, & Ptacek, 1995). Performance can be subdivided in *objective* and *subjective* performance. Objective (or actual) performance refers to performance based on objective criteria such as time/distance measures. Subjective performance is based on an athlete's (own) perceived performance assessment, such as self-ratings of performance (Beedie, Terry, & Lane, 2000). As an athlete may feel that he/she played very well despite losing the match/race against a superior opponent, this indicates the value of measuring subjective performance; positive appraisals of one's own performance have been positively linked with intrinsic motivation (cf. McAuley & Tammen, 1989).

The outcomes have been examined in relation to achievement goals and motivational climate in sport. In general, task orientation and perceived mastery climate have been linked positively with effort, enjoyment, psychological skill use, objective and perceived performance, and negatively with trait anxiety and tension. Ego orientation has been shown to be typically unrelated to effort, enjoyment, and perceived performance, in some studies positively related to trait anxiety and objective performance, and either unrelated or positively related to tension and psychological skill/strategy use. Perceived performance climate has been associated negatively with effort and enjoyment, positively with trait anxiety and tension, and typically unrelated to psychological skill use and performance (Balaguer, Duda,

Atienza, & Mayo, 2002; Biddle et al., 2003; Cervelló et al., 2007; Harwood et al., 2008; Ntoumanis & Biddle, 1999; Smith et al., 2006; Stoeber & Crombie, 2010; Stoeber, Uphill, & Hotham, 2009).

Finally, it has been suggested that achievement goals and perceived motivational climate interact with each other in predicting motivational outcomes (e.g., Dweck & Legget, 1988). Considering *both* variables - and their interplay - may enhance our understanding of the motivational processes in sport contexts (Duda, 2001; Newton & Duda, 1999; Roberts et al., 2007). A potential way that goals and perceived climate may interact is the matching hypothesis (Harackiewicz & Sansone, 1991; Pervin, 1968), which suggests that the climate that matches people's goals will result in adaptive responses, while a lack of fit will result in maladaptive responses. For example, a highly task involved athlete who perceives the motivational climate as mastery-oriented may display more adaptive motivational patters than when he or she perceives it as performance-oriented. Previous research has reported mixed findings regarding the interactive effects of goals and climate. For example, in a physical education context, high task-oriented students showed higher levels of intrinsic motivation when they perceived a strong mastery climate, but lower intrinsic motivation when they perceived a weak mastery climate (Standage, Duda, & Ntoumanis, 2003). Another study that examined female volleyball players did not find interaction effects between goal orientations and perceived motivational climate on effort, enjoyment and tension (Newton & Duda, 1999).

Goals and outcomes in training and competition. Training and competition contexts may influence the *relationships* between goals and motivational responses/outcomes. Achievement goal researchers have hypothesized about the functionality of the goals in each context. Conroy, Cassidy and Elliot (2008) have argued that goals are most likely to predict outcomes when the goals are 'functionally congruent' with the aims of the context, and mastery/task goals may be more relevant for predicting outcomes in training where athletes

focus is primarily on skill development and maintenance, whereas performance/ego goals may be more relevant for competition where athletes primary aim is to win or not to lose. Harwood (2002) proposed a similar relevance for task goals in training, however, argued that a more balanced profile of task and ego goals may be most beneficial in competition.

To date, there is very little research conducted that examined this issue. One study examined the relationship between goal orientations and specific practice and competition strategies, and demonstrated that task orientation was associated with adaptive achievement strategies, such as commitment to practice and persistence in competition, whereas ego orientation was related with more maladaptive practice strategies, such as avoiding practice sessions but unrelated to competition strategies (Lochbaum & Roberts, 1993). Another study examined the relationship between goal orientations and psychological skills (e.g., goal setting and self-talk) across training and competition, and found that when applying psychological skills effectively in *both* contexts, task orientation was the critical goal, whereas ego orientation was neither beneficial nor detrimental (Harwood, Cumming, & Fletcher, 2004). These studies provided a valuable insight how *general sport* goal orientations relate to outcomes in training and competition, however, they did not take into account that goal orientations may be specific to each context, which may reveal different relationships within each context. Furthermore, the findings discussed refer only to strategy use, indicating the need to extend this issue to other important achievement responses.

Despite the limited research, conceptual reasoning (e.g., Harwood & Hardy, 2001; Harwood, Hardy, & Swain, 2000), together with empirical findings stemming from the sport domain (e.g., Biddle et al., 2003; Harwood et al., 2008), allow to provide a rationale why and how the contexts may influence the relationships between goal orientations and the selected achievement responses/outcomes. This rationale will be discussed now in more detail. The relationships between a task goal and achievement responses should be relatively similar

between the two contexts as a focus on self-referenced criteria for success should be relatively unaffected by (normative) environmental influences. As task-oriented athletes may have an intrinsic desire to improve in training and to perform well in competition, they should invest effort and effectively use psychological skills, which may facilitate performance improvement, in both contexts. The relationships between an ego goal and achievement responses may differ between contexts. In training, ego-oriented athletes may perceive a lack of challenge to demonstrate normative success as this is not *formally* rewarded and may be less strongly emphasized. Therefore, highly ego-oriented athletes may not work hard and/or invest in psychological skill use, and they may not enjoy practising very much. Accordingly, an ego goal should not lead to considerable skill improvement during training.

In contrast, competition is the ideal context for ego-oriented athletes to demonstrate normative competence. Therefore, endorsing this goal should lead to an investment in effort and psychological skills use, which may facilitate performance in competition (cf. Harwood & Hardy, 2001; Harwood et al., 2004). As ego-oriented athletes derive positive affect from normative success (Treasure & Roberts, 1994) their enjoyment should also depend on such success. However, because sport competition typically has a balanced win/loss ratio, ego orientation should, on average, be unrelated to enjoyment and perceived performance in this context. Finally, the normative success criteria embedded in competition could make highly ego-oriented athletes worried about receiving an approving evaluation leading them to experience more tension and anxiety in this context.

Apart from the potential different functionality of the goals between contexts, also a potential variation in goals across training and competition may - as antecedents - influence the *strength* of the relationships with outcomes across the two contexts. Thus, although a task goal should lead to relatively similar relationships with outcomes between contexts, a potential contextual variation in this goal (e.g., Williams, 1998) may affect the strength of the

relationships across contexts. Finally, this rationale focused on task and ego *orientations*, however, as these constructs reflect the tendency to be task or ego involved, respectively, similar directions should occur on a situation-specific (goal involvement) level of analysis.

Climate and outcomes in training and competition. With respect to the motivational climate, perceived mastery climate should lead to adaptive and perceived performance climate should lead to maladaptive patterns in both contexts (Harwood et al., 2008; Ntoumanis & Biddle, 1999). Thus, from this perspective, the context may not influence the relationships between the perceived climate and outcomes. However, a performance climate may vary, which may affect the strength of the relationships with outcomes, across the two contexts. Specifically, perceptions of a performance climate may be more prominent in competition than in training, which may strengthen the negative impact of this climate on motivational outcomes in competition compared to training. Finally, a perceived mastery climate (as created by the coach) should be relatively stable across the two contexts, and therefore should not lead to a variation in the strength of the relationships across the two contexts.

No research exists that examined potential interactions between task and ego goals, or between perceptions of a mastery and performance climate, or between goals and climate, on outcomes across training and competition. As previous research has reported mixed findings for similar interaction effects in sport and physical education (e.g., Newton & Duda, 1999; Standage et al., 2003) it is difficult to hypothesise if and how these interactions emerge in each context. However, considering that both goals and performance climate perceptions - and thus their interplay - may be specific to training and competition, making this contextual distinction may also reveal context-specific interaction patterns.

Limitations of the Literature

Research on the contextual influence on achievement goals and perceptions of the motivational climate is scarce. Although research indicates that goals may vary across

training and competition (cf. Tammen, 1998; Williams, 1998), these findings also suggest some conceptual inconsistencies. Specifically, based on conceptual grounds (Nicholls, 1984, 1989), it may be expected that athletes may employ more normative criteria for success, and thereby endorse higher levels of ego goals, in competition than in training. In addition, research stemming from goal setting theory has shown that athletes set for training predominantly process goals (e.g., mastering a skill/strategy), whereas for competition they set a more balanced mix of process and outcome (e.g., beating an opponent) goals (Brawley, Carron, & Widmeyer, 1992). While recognizing that goals athletes *set* are not equivalent to achievement goals as conceptualised by Nicholls (1989), these goal setting strategies may provide some indication for situational goal involvement (Duda, 2001); thereby suggesting that normative success striving may increase from training to competition.

Another limitation of previous research is that it did not examine factors that may explain potential goal differences or consistency, such as *gender* and *type of sport*. With respect to gender, Williams (1998) - who did not find a variation in ego involvement - only examined female athletes. This may indicate a 'gender bias unique to females' (Williams, 1998). Indeed, considering that males tend to adopt higher ego goals than females (e.g., Marsh, 1994) they may be more sensitive to the normative cues in competition, which could strengthen their ego goal in this context. Furthermore, goal variation across the two contexts may depend on sport type, classified as *individual* and *team sports.* For example, ego-involved cues in competition may be more strongly experienced in individual sports than in team sports because individual sport athletes are in general more personally identifiable (e.g., ranking lists with names of individual performers) and publicly evaluated (see Hanrahan & Cerin, 2009; Harwood, 2002). Hence, considering the potential influential variables 'gender' and 'sport type' may extend our understanding in goal endorsement across the two contexts.

Despite the important role that athletes' perceived motivational climate plays in influencing achievement outcomes in sport (Harwood et al., 2008; Ntoumanis & Biddle, 1999), to date, no study has examined whether these perceptions vary across training and competition contexts. This suggests a notable shortcoming in the extant literature when considering that training and competition may have specific reward structures, which may lead to different appraisals of the climate in each context (cf. Ames, 1992a, 1992b).

So far, research that examined goals across the two contexts examined only mean-level differences (Tammen, 1998; Williams, 1998). Recent research in the education domain indicates that a multiple analytical approach could provide a more complete understanding of contextual motivation (Muis & Edwards, 2009). For instance, examining cross-contextual correlations may reveal whether goals and perceived climate in training are related to their respective constructs in competition, which may indicate if the constructs are sufficiently distinct to merit separate examination (cf. Duda & Nicholls, 1992). In addition, mean-level analyses may not identify variation in goals and climate perceptions if rather equal increases and decreases in individual responses occur. Therefore, research is needed that includes methods that allow an examination of the contextual effects on goals and perceived motivational climate at an individual level of analysis (Fryer & Elliot, 2007).

To date, no research has examined the *relationships* between goals, climate, and achievement responses/outcomes across training and competition by considering the goals and/or perceived motivational climate as context-specific constructs. Examining these relationships may provide vital practical insights in the utility of goals and climate perceptions in relation to adaptive motivational responses and performance within each context. These relationships may also depend on other variables such as gender and type of sport; therefore, examining these variables is important.

Summary

Although achievement motivation is a widely examined construct in sport, research has paid very little attention to how it is affected by the two core sub-contexts in sport: training and competition (cf. Harwood et al., 2008). Both contexts play a central role in an athlete's sport life. A salient difference between the two contexts is the focus on personal skill development versus normative evaluation as emphasized in the organisational structures of training and competition, respectively. From an achievement goal theory perspective, the dichotomous task vs. ego goal (Nicholls, 1989) and mastery vs. performance motivational climate (Ames, 1992b) frameworks, indicate to form a strong conceptual basis to expand our understanding in motivational processes within and across the two contexts. As organised training and competition structures may emphasize different achievement criteria, it may affect individuals' achievement goals and perceptions of the climate across these contexts. Finally, the extant literature has shown that goals and climate perceptions affect important responses/outcomes in sport such as effort, enjoyment/interest, tension and trait anxiety, psychological skills, and performance. There is a conceptual rationale/basis provided which suggests that the contexts may also influence these relationships.

Based on the above, two central themes emerge: (1) the contextual influence of training and competition on achievement goals and perceptions of the motivational climate; and (2) the contextual influence of training and competition on the relationships between goals, perceived motivational climate, and achievement responses/outcomes.

Aim of Thesis and Study Purposes

The aim of this thesis is to provide a better understanding of the contextual influence of training and competition on athletes' achievement motivation. The two central purposes of this thesis are to examine: (1) the influence of training and competition on goals and perceptions of the motivational climate, and (2) the influence of the two contexts on the

relationships between goals, perceived motivational climate, and achievement responses/outcomes. To address these two central purposes, four empirical studies were conducted.

The purposes of study one were to examine: (a) consistency and differences in task and ego orientations across training and competition contexts, and (b) the influence of training and competition on the relationships between goal orientations and effort, enjoyment, and psychological skill use across training and competition. This study focused on an individual sport: Tennis, because in this sport athletes typically compete head-to-head, which may make them more personally identifiable and publicly evaluated in competition compared to team sports (see Harwood, 2002). Accordingly, the normative cues in this context should have a relatively big impact on ego-oriented athletes compared with the presumably more neutral (in terms of normative cues) goal structure in organised training. An additional purpose of this study was to examine whether goal orientations predicted perceived improvement in training and perceived performance in competition. These subjective appraisals of achievement were separated in improvement and performance as each may be considered as specifically relevant in training and competiton, respectively.

Study two extended the findings of study one to a team sport: Football. This study had two specific purposes: the first was to examine consistency and differences in goal orientations and perceptions of the motivational climate across training and competition contexts. Another extension to study one was that the contextual influence was also assessed on a within-person level. The second purpose of this study was to examine the influence of training and competition on the relationships between goal orientations, perceived motivational climate, and effort, enjoyment and tension. Interaction effects between goals and perceived climate on outcomes were also examined for this second purpose.

Study three extended the findings from the previous two studies to a more diverse sample of athletes from a variety of individual and team sports, and examined: (a) consistency and differences in goal orientations across training and competition, and (b) the influence of training and competition on the relationships between goal orientations and effort, enjoyment and trait anxiety across the two contexts. The moderating effect of sport type was also examined.

Study four *experimentally* tested the influence of training and competition on achievement motivation. This study examined: (a) differences in goal *involvement* across training and competition; (b) whether goals mediated and/or moderated the effects of context on responses/outcomes; and (c) the influence of training and competition on the relationships between goal involvement and responses/outcomes. The outcomes examined in this study were effort, enjoyment, tension, and objective performance. A golf putting task with novice golf players was chosen to address these purposes. Thus, this study examined variables on a situation-specific level. This study also examined the variation in motivational outcomes across the two contexts, this assessment made it possible to examine an important question if a variation in goals causes a variation in outcomes across the two contexts.

References

Ames, C. (1992a). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), *Motivation in Sport and Exercise* (pp. 161–177). Champaign, IL: Human Kinetics.

Ames, C. (1992b). Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261–271.

Ames, C., & Ames, R. (1984). Goal structures and motivation. *The Elementary School Journal, 85,* 39–52.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260–267.

Baker, J., Côté, J., & Abernethy, B. (2003a). Sport-specific practice and the development of expert decision-making in team ball sports. *Journal of Applied Sport Psychology, 15,* 12–25.

Baker, J., Côté, J. & Abernethy, B. (2003b). Learning from the experts: Practice activities of expert decision-makers in sport. *Research Quarterly for Exercise and Sport, 74,* 342–347.

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.

Beedie, C. J., Terry, P. C., & Lane, A. M. (2000). The profile of mood states and athletic performance: Two meta-analyses. *Journal of Applied Sport Psychology, 12*, 49–68

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3,* 1–20. doi: 10.1080/17461390300073504

Brawley, L.R., Carron, A.V., & Widmeyer, W.N. (1992). The nature of group goals in sport teams: A phenomenological analysis. *The Sport Psychologist, 6*, 323–333.

Cervelló, E., Santos-Rosa, F., García Calvo, T., Jiménez, R., & Iglesias, D. (2007). Young tennis players' competitive task involvement and performance: the role of goal orientations, contextual motivational climate, and coach-initiated motivational climate. *Journal of Applied Sport Psychology, 19*, 304–321.

Cooke, A., Kavussanu, M., McIntyre, D., & Ring, C. M. (2011). Effects of competition on endurance performance and the underlying psychological and physiological mechanisms. *Biological Psychology 86*, 370–378. doi:10.1016/j.biopsycho.2011.01.009

Conroy, D. E., Cassidy, C. M., & Elliot, A. J. (2008). Prospective relations between 2×2 achievement goals and the quality of sport training. *Revue internationale de psychologie sociale, 21*, 109–134.

Conroy, D.E., Elliot, A.J., & Coatsworth, J.D. (2007). Competence motivation in sport and exercise: The hierarchical model of achievement motivation and self determination theory. In M.S. Hagger & N.L.D. Chatzisarantis (Eds.), *Intrinsic motivation and self-determination in exercise and sport* (pp. 181–192). Champaign, IL: Human Kinetics.

Côté, J., Baker, J., & Abernethy, B., (2007). Practice and play in the development of sport expertise. In: R. Eklund and G. Tenenbaum (Eds.). *Handbook of sport psychology.* 3rd ed. Hoboken, NJ: Wiley, 184–202.

Côté, J., Salmela, J. H., & Russell, S. (1995). The knowledge of high-performance gymnastic coaches: Competition and training considerations. *The Sport Psychologist, 9,* 76–95.

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology, 18*, 105–115.

Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (1987). The support of autonomy and the control of behavior. *Journal of Personality and Social Psychology, 53*, 1024–1037.

Duda, J. L. (1992). Motivation in sport settings: A goal perspective approach. In G. C. Roberts (Ed.), *Motivation in sport and exercise* (pp. 57–91). Champaign, IL: Human Kinetics.

Duda, J. L. (2001). Achievement goal 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., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290–299.

Dweck, C. S. (1986). Motivational processes affecting learning. *American Psychologist, 41,* 1040–1048.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95*, 256–273.

Elliot, A. J. (1997). Integrating the ‘‘classic’’ and ‘‘contemporary’’ approaches to achievement motivation: a hierarchical model of approach and avoidance achievement motivation. In M. L. Maehr, & P. R. Pintrich (Eds.), *Advances in motivation and achievement* (Vol. 10, pp. 143–179). Greenwich, CT: JAI Press.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501–519. doi: 10.1037//0022-3514.80.3.501

Fryer, J. W., & Elliott, A. J. (2007). Stability and change in achievement goals. *Journal of Educational Psychology, 99*, 700–714. doi:10.1037/0022-0663.99.4.700

Giacobbi, P.R. Jr., & Weinberg, R.S. (2000). An examination of coping in sport: Individual

trait anxiety and situational consistency. *The Sport Psychologist, 14*, 42–62.

Gill D., L. (1986). *Psychological Dynamics of Sport.* Champaign, Ill: Human Kinetics Publishers Inc.

Goudas, M., & Biddle, S. (1994). Perceived motivational climate and intrinsic motivation in school physical education classes. *European Journal of Psychology of Education, 9*, 241–250.

Hanrahan, S.J., & Cerin E. (2009). Gender, level of participation, and type of sport: Differences in achievement goal orientation and attributional style. *Journal of Science and Medicine in Sport 12,* 508–512. doi:10.1016/j.jsams.2008.01.005

Harackiewicz, J. M., Barron, K. E., & Elliot, A. J. (1998). Rethinking achievement goals: When are they adaptive for college students and why? *Educational Psychologist*, *33*, 1–21.

Harackiewicz, J., & Sansone, C. (1991). Goals and intrinsic motivation: You can get there from here. In M. Maehr, & P. Pintrich (Eds.), Advances in motivation and achievement: Goals and self-regulation, Vol. 7 (pp. 21–49). Greenwich, CT: JAI Press.

Harwood, C. G. (2002). Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *Journal of Applied Sport Psychology, 14*, 106–119.

Harwood, C. G., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology, 16*, 318–332.

Harwood, C. G., & Hardy, L. (2001). Persistence and effort in moving achievement goal research forward: A response to Treasure and colleagues. *Journal of Sport & Exercise Psychology, 23,* 330–345.

Harwood, C. G., Hardy, L., & Swain, A. (2000). Achievement goals in sport: a critique of conceptual and measurement issues. *Journal of Sport & Exercise Psychology, 22,* 235–255.

Harwood, C. G., Spray, C. M., & Keegan, R. J. (2008). Achievement goal theories in sport. In T. Horn (Ed.), *Advances in sport psychology* (3rd Edition). (pp. 157-185). Champaign, IL: Human Kinetics.

Hays, K., Maynard, I., Thomas, O., & Bawden, M. (2007). Sources and types of confidence identified by world class sport performers. *Journal of Applied Sport Psychology*, *19*, 434–456.

Horn, T. S. (1985). Coaches feedback and changes in children's perceptions of their physical competence. *Journal of Educational Psychology, 77,* 174–186.

Johnson, D. W., & Johnson, R. (1989). *Cooperation and competition: Theory and research*. Edina, MN: Interaction Book Company.

Kaplan, A., & Maehr, M. L. (2006). The contribution and prospects of goal orientation theory. *Educational Psychology Review, 19*, 141–184.

Kilpatrick, M., Hebert, E., & Bartholomew, J. (2005). College students' motivation for physical activity: differentiating men's and women's motives for sport participation and exercise. *Journal of American College Health, 54*, 87–94.

Kohn, A. (1992). *No contest: The case against competition.* Boston: Houghton Mifflin.

Lochbaum, M. R., & Roberts, G. C. (1993). Goal orientations and perceptions of the sport experience. *Journal of Sport & Exercise Psychology, 15*, 160–171.

Maehr, M. L. (1987). Thoughts about motivation. In C. Ames & R. Ames (Eds.), *Research in motivation and education: Goals and cognitions* (Vol. 3, pp. 299–315). New York: Academic Press.

Marsh, H. (1994). Sport motivation orientations: Beware of jingle- jangle fallacies. *Journal of Sport & Exercise Psychology, 16,* 365–380.

Martens, R. (1977). *Sport competition anxiety test*. Champaign, IL: Human Kinetics.

McAuley, E., & Tammen, V. V. (1989). The effects of subjective and objective competitive outcomes on intrinsic motivation. *Journal of Sport & Exercise Psychology*, *11,* 84–93.

Muis, K., R., & Edwards, O. (2009). Examining the stability of achievement goal orientation. *Contemporary Educational Psychology, 34,* 265–277.

Newton, M., & Duda, J. L. (1999). The interaction of motivational climate, dispositional goal orientations, and perceived ability in predicting indices of motivation. *International Journal of Sport Psychology, 30*, 63–82.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91*, 328–346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Ntoumanis, N., & Biddle, S. (1999). A review of motivational climate in physical activity. *Journal of Sports Sciences, 17,* 643–665. doi:10.1080/026404199365678

Pervin, L. A. (1968). Performance and satisfaction as a function of individual-environment fit. *Psychological Bulletin*, *69,* 56–68.

Oliver, E. J., Hardy, J., & Markland, D. (2010). Identifying important practice behaviors for the development of high-level youth athletes: Exploring the perspectives of elite coaches. *Psychology of Sport and Exercise*, *11*, 433–443.

Pintrich, P. R., Conley, A. M., & Kempler, T. M. (2003). Current issues in achievement goal theory and research. *International Journal of Educational Research, 39,* 319–337.

Roberts, G. C., Treasure, D. C., & Conroy, D. E. (2007). Understanding the dynamics of motivation in sport and physical activity: An achievement goal interpretation. In G. Tenenbaum, & R.C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 3–30). Hoboken, New Jersey: Wiley & Sons.

Roberts, G. C., Treasure, D. C., & Kavussanu, M. (1996). Orthogonality of achievement goals and its relationship to beliefs about success and satisfaction in sport. *Sport Psychologist, 10,* 398–408.

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68–78.

Smith, R. E., Schutz, R. W., Smoll, F. L., & Ptacek, J. T. (1995). Development and validation of a multidimensional measure of sport-specific psychological skills: The Athletic Coping Skills Inventory-28. *Journal of Sport & Exercise Psychology, 17*, 379–398.

Smith, R. E., Smoll, F. L., Cumming, S. P., & Grossbard J. R. (2006). Measurement of multidimensional sport performance anxiety in children and adults: The Sport Anxiety Scale-2. *Journal of Sport & Exercise Psychology, 28,* 479–501.

Spray, C. M., & Keegan, R. J. (2005). Beyond the dichotomous model of achievement goals in sport and exercise psychology: Comment on Elliot and Conroy (2005). *Sport & Exercise Psychology Review, 1*, 47–49.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). Predicting motivational regulations in physical education: The interplay between dispositional goal orientations, motivational climate, and perceived competence. *Journal of Sports Sciences, 21*, 631–647. doi:10.1080/0264041031000101962

Stanne, M., Johnson, D., & Johnson, R. (1999). Does competition enhance or inhibit motor performance: A meta-analysis. *Psychological Bulletin, 125*, 133–154.

Stoeber, J., & Crombie, R. (2011). Achievement goals and championship performance: Predicting absolute performance and qualification success. *Psychology of Sport and Exercise, 11,* 513–521. doi:10.1016/j.psychsport.2010.07.007

Stoeber, J., Uphill, M. A., & Hotham, S. (2009). Predicting race performance in triathlon: the role of perfectionism, achievement goals, and personal goal setting. *Journal of Sport & Exercise Psychology, 31*, 211–245.

Strachan, L., Côté, J., & Deakin, J. (2011). A new view: exploring positive youth development in elite sport contexts. *Qualitative Research in Sport, Exercise and Health, 3*, 9 –32. doi: 10.1080/19398441.2010.541483

Tammen, V. V. (1998). Changes in task and ego goal orientations in relation to training of competitive situations. *Journal of Sport & Exercise Psychology, 20* (Suppl.), S120.

Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation of comprehensive measure of athletes' psychological skills. *Journal of Sports Sciences, 17,* 697–711.

Toering, T., Elferink-Gemser, M., Jordet, G., Jorna, C., Pepping, G., & Visscher, C., (2011). Self-regulation of practice behavior among elite youth soccer players: An exploratory observation study. *Journal of Applied Sport Psychology, 23*, 110 –128. doi: 10.1080/10413200.2010.534544

Treasure, D. C., & Roberts, G. C. (1994). Cognitive and affective concomitants of task and ego goal orientations during the middle school years. *Journal of Sport & Exercise Psychology, 16,* 15–28.

Vallerand, R. J. (2007). Intrinsic and extrinsic motivation in sport and physical activity: A review and a look at the future. In G. Tenenbaum, & R. C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 59–83). Hoboken, NJ: John Wiley & Sons, Inc.

Vansteenkiste, M., & Deci, E. L. (2003). Competitively contingent rewards and intrinsic motivation: Can losers remain motivated? *Motivation and Emotion, 27*, 273–299.

Weiss, M. R., & Ferrer-Caja, E. (2002). Motivational orientations and sport behavior. In T. S. Horn (Ed.), *Advances in sport psychology* (2nd ed.). (pp. 101–183)

Champaign, IL: Human Kinetics.

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47–57.

CHAPTER TWO

Study one: Achievement Goals and Motivational Responses in Tennis: Does the Context Matter?

Abstract

Objectives: This study examined: (a) whether athletes' goal orientations differ across training and competition; (b) whether goal orientations predict effort, enjoyment, and psychological skill use differently in training and competition; and (c) whether goal orientations predict perceived improvement in training and perceived performance in competition.

Method: Participants were 116 competitive tennis players (mean age = 19.99, *SD* = 5.82), who completed questionnaires measuring goal orientations, effort, enjoyment, and psychological skill use in training and competition, perceived improvement in training, and perceived performance in competition.

Results: Dependent *t*-tests revealed that athletes reported higher task orientation in training than in competition and higher ego orientation in competition than in training, while Pearson product-moment correlations revealed a high cross-contextual consistency for both task and ego goal orientations between training and competition. Regression analyses indicated that task orientation predicted positively effort, enjoyment, self-talk, and goal setting in both contexts, perceived improvement in training, and perceived performance in competition. An interaction effect also emerged whereby ego orientation predicted positively effort in competition only when task orientation was low or average.

Conclusions: The findings suggest that goal orientations may differ between training and competition; task orientation is the goal that should be promoted in both contexts; and the context may affect the relationship between goal orientations and effort, enjoyment, and goal setting.

Introduction

According to achievement goal theory (Ames, 1992; Nicholls, 1989), individuals engage in achievement situations in order to develop or demonstrate competence. However, competence or ability can be construed in two different ways: it can be judged in relation to one's own effort and mastery or it can be construed as capacity (Nicholls, 1984, 1989). The two conceptions of ability form the basis for two distinct achievement goals: *task* and *ego involvement*. When individuals are task involved, they evaluate ability using self-referenced criteria and feel successful when they improve, learn something new, or master a task. In contrast, when they are ego involved, they evaluate ability using other-referenced criteria and feel successful when they establish superiority over others (Nicholls, 1989). Individuals have a proneness to the two types of involvement which are known as *task* and *ego orientations* (Nicholls, 1989).

Whether one is task or ego involved in a given achievement context also depends on situational factors with certain conditions promoting task or ego involvement. Specifically, tasks that are challenging or offer the opportunity for growth in competence, without salient task-extrinsic incentives and evaluative cues, are expected to promote task involvement (Nicholls, 1989). In contrast, evaluative, interpersonally competitive conditions, as well as those that induce public self-awareness should promote ego involvement (Nicholls, 1989).

To date, the vast majority of sport studies using the achievement goal framework have examined achievement goals in the general context of sport (Biddle, Wang, Kavussanu, & Spray, 2003). However, given that certain conditions are assumed to facilitate task versus ego involvement, it may be important to consider the two core sport sub-contexts[I]: *training* and

[I] We refer to training and competition as "sub-contexts" when we discuss them in relation to the general context of sport. In all other cases, we refer to them as "contexts" for simplicity reasons and because the term sub-context seems relevant only when used to denote the relationship to a broader context. As our main purpose was to contrast the specific contexts of training and competition to each other rather than to the general context of sport, referring to them as contexts in all other cases seems appropriate.

competition. These contexts entail conditions that could promote task or ego involvement. Specifically, as an organised structure, training provides opportunities for athletes to practise and develop their skills, whereas competition is formally regulated to test these skills against other athletes. Although social comparison may occur in training, it is inherent in organised competition because objective success in this context is evaluated using normative criteria. Competition may also involve a stronger public evaluation compared to training due to the presence of spectators. These structural characteristics of training and competition may lead athletes to develop goal orientations that are specific to each context. These goal orientations represent the typical goal involvement that athletes experience in these two contexts.

To date, the question of whether goal orientations differ between training and competition has received very little research attention. In a study that examined this issue, athletes reported higher task orientation in training than in competition but did not differ in ego orientation between the two contexts (Tammen, 1998). Similar findings were reported in another study (Williams, 1998) that examined goal involvement, and found that female softball players were more task involved during practice/training than in game situations but did not differ in ego involvement (Williams, 1998). Finally, Harwood (2002) found that high-level athletes reported significantly higher ego and lower task orientation in the specific context of competition than in the general context of sport and recommended extending this line of research by examining dispositional tendencies in the specific training context. Taken together, the findings of these studies suggest that achievement goals may differ across training and competition and support the value of making this distinction.

To date, research examining goal orientations in sport has provided evidence that goals have implications for two important motivational responses: *effort* and *enjoyment/interest*. These variables have been positively associated with task orientation and unrelated to ego orientation in the general context of sport (Biddle et al., 2003). However, these relationships

may vary as a function of the specific contexts of training versus competition. Although each specific training session can vary in the extent to which it is task or ego-involving, in general, the purpose of organised training is to enable athletes to practise and improve their skills. Task-oriented individuals have an intrinsic interest and a desire to improve through effort (Nicholls, 1989), and therefore, task orientation may promote effort and enjoyment in this context. However, such relationships are not expected in this context for athletes who are high in ego orientation as in this context normative goal striving may be less strongly emphasized and is not formally rewarded (e.g., through rating and ranking systems etc.). Thus, ego orientation should be unrelated to effort and enjoyment in the training context.

In competition, different relationships between goals and motivational responses are expected. Specifically, during competition, athletes high in task orientation may exert effort because they are likely to achieve their self-referenced competition goals, for example personal bests. They may also experience enjoyment, as personal performance mastery has been identified as the most important source for athletes' enjoyment (Wiersma, 2001). Athletes with a high ego orientation may respond similarly with respect to effort in their striving to demonstrate normative superiority (Harwood & Hardy, 2001) as competition is the ideal context for these athletes to demonstrate their competence relative to others. Thus, ego orientation may promote effort in this context. It has been suggested that a positive effect of ego orientation on effort may be moderated by task orientation, such that high ego-oriented athletes may apply effort only when they also have high task orientation (Harwood & Hardy, 2001). Ego orientation may or may not lead to enjoyment depending on how athletes perform in comparison to others during competition.

Achievement goals have also been examined in relation to the use of *psychological skills*. Three psychological skills widely used in sport are goal setting, self-talk, and attentional control (Thomas, Murphy, & Hardy, 1999). These psychological skills are

regarded by coaches as important skills in tennis which is the sport on which we focus in this study (Gould, Medbery, Damarjian, & Laurer, 1999). Using cluster analysis to classify athletes in goal-profile groups, Harwood, Cumming, and Fletcher (2004) found that higher-task/moderate-ego athletes used goal setting and self-talk in both training and competition more often than lower-task/higher-ego and moderate-task/lower-ego athletes. Thus, task orientation was the critical goal regarding the use of goal setting and self-talk, and the two goals had similar effects on goal setting and self-talk in the two contexts. However, Harwood et al. (2004) did not examine whether goal orientations specific to training and competition are differentially related to the use of these two psychological skills in the two contexts.

Attentional control refers to selectively attending to and concentrating on relevant cues while disregarding irrelevant ones in order to best accomplish the goals of the task (Singer, Cauraugh, Murphey, Chen, & Lidor, 1991) and has not been investigated in relation to achievement goals in sport. However, concentration which is conceptually similar to attentional control and has been defined as excluding irrelevant thoughts from consciousness and tuning in to the task at hand (Jackson & Csikszentmihalyi, 1999) has been examined. Task orientation has been positively associated with concentration in sport and physical education contexts (e.g., Moreno, Cervello, & Gonzales-Cutre, 2008; Papaioannou & Kouli, 1999), whereas ego orientation has been either unrelated (Papaioannou & Kouli, 1999) or weakly related (Moreno et al., 2008) to concentration. However, no study has examined whether the relationship between goal orientations and the use of attentional control differs across organised training and competition. Research is needed to address this issue.

Finally, general sport goal orientations have been examined in relation to perceived improvement and performance in sport. Task orientation has been positively associated with perceived improvement, whereas ego orientation was unrelated to this variable in handball players (Balaguer, Duda, Atienza, & Mayo, 2002). The two goals have been unrelated to

perceived improvement in tennis players (Balaguer, Duda, & Crespo, 1999). With regard to perceived performance, task orientation has been positively related and ego orientation unrelated to perceived performance as measured over one match (Cervelló, Santos-Rosa, Calvo, Jiménez, & Iglesias, 2007), but the two goals were unrelated to perceived performance when it was assessed over a longer time period (i.e., 'during the current year'; Balaguer et al., 2002). To date, no study has examined whether context-specific goal orientations are differentially related to perceived improvement in training and perceived performance in competition.

In sum, although the beneficial effects of task orientation in sport have been well established, making the distinction between training and competition could enhance our understanding of the motivational consequences of the two goals. The first purpose of this study was to examine whether tennis players' goal orientations differ across training and competition. We focused on tennis because athletes in this sport typically compete head-to-head, which may evoke a stronger perception that one can be personally identifiable and publicly evaluated in competition, and subsequently a stronger increase in ego orientation from training to competition compared to team sport athletes (see Harwood, 2002). We hypothesized that athletes would report higher task orientation in training than in competition and higher ego orientation in competition than in training (Harwood, Hardy, & Swain, 2000; Williams, 1998).

The second purpose was to examine whether goal orientations predict effort, enjoyment, and psychological skill use differently in training and competition. We hypothesized that task orientation would positively predict all motivational responses in both contexts (Biddle et al., 2003; Harwood et al., 2004; Papaioannou & Kouli, 1999) and that ego orientation would be unrelated to these variables in training but would positively predict effort in competition (Harwood & Hardy, 2001). We made no predictions regarding ego orientation and enjoyment,

and psychological skill use, in competition. The third purpose was to examine the relationship between context-specific goals and perceived improvement and performance. We expected that task orientation would positively predict perceived improvement and performance and that ego orientation would be unrelated to these variables (Balaguer et al., 1999, 2002; Cervelló et al., 2007).

Method

Participants

Participants were 116 (94 males, 22 females) tennis players, recruited from 28 tennis clubs representing 16 counties of Great Britain. At the time of data collection, the players' age ranged from 16 to 40 years and their mean age was 19.99 (*SD* = 5.82) years. They had been playing tennis competitively for an average of 8.52 (*SD* = 5.13) years, with 90% having a minimum of 3 years of competitive tennis experience (Median = 8, Mode = 10). Their competition level varied from Club (43.5 %), County (13.9%), Regional (16.5 %), National (19.1 %), to International (7.0 %). Their individual playing standards ranged from a Lawn Tennis Association (LTA) rating of 10.2 (lowest) to 1.1 (highest), with a median of 7.1. At the time of data collection, participants' mean number of attended training sessions per week was 2.01 (*SD* = 1.16), and the number of competitive ranking/rating matches they played in that year varied from 1 to 5 (44.6 %), 5 - 10 (12.5 %), 10 - 15 (10.7 %), 15 - 20 (2.7 %), to 20 or more (29.5 %).

Measures

The questionnaire had two parts, one referring to the competition and one referring to the training context. The players were oriented toward the two contexts through written instructions (e.g., "Please think about your tennis experience in *training*, and respond honestly to the following statements…"). In addition, each individual questionnaire had explicit references to training or competition to ensure athletes were oriented to the specific context

when responding to the items. A similar procedure has been used in previous research that examined goal orientations in school and sport (Castillo, Duda, Balaguer, & Tomás, 2009; Duda & Nicholls, 1992).

Goal orientations. Athletes' goal orientations in training and competition were measured with the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which consists of two six-item subscales measuring task and ego goal orientations. Participants were asked when they feel most successful in the two contexts. For the training context, the stem was "In training, I feel most successful when…", and for the competition context, it was "In competition, I feel most successful when…". Examples of items were "I work hard" for task orientation, and "I am clearly superior" for ego orientation. Identical items were used for both contexts. Participants responded on a 5-point Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The POSQ has demonstrated satisfactory internal consistency with Cronbach's (1951) alpha coefficients of .90 for the task and .84 for the ego orientation subscale (Roberts et al., 1998). The mean for each subscale was computed and used in all analyses. This procedure was followed for all variables.

Effort and enjoyment/interest. Two subscales of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) were used to measure effort (5 items) and enjoyment/interest (7 items) in the two contexts. Example items are: "I put a lot of effort into training/competition" and "I enjoy training/competition very much". Each item was rated on a Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). These subscales have demonstrated good reliability in previous research (effort $\alpha = .84$; enjoyment/interest $\alpha = .78$; McAuley, Duncan, & Tammen, 1989).

Psychological skills. The psychological skills of goal setting, self-talk, and attentional control were assessed using the relevant scale items from the Test of Performance Strategies (TOPS; Thomas et al., 1999). In the TOPS, attentional control is included only as a subscale

in the training context. However, we also assessed this variable in competition by using the items of the training subscale. The players were asked to indicate how often they used each skill in training/competition. Example items are: for goal setting, "I have very specific goals for training/competition sessions"; for self-talk, "I talk positively to myself to get the most out of training/competition"; and for attentional control, "during training/competition I focus my attention effectively". Each subscale consists of four items rated on a Likert scale anchored by 1 (*never*) and 5 (*always*). Previous research has reported good reliability for these subscales with alpha coefficients ranging from .73 to .81 (Thomas et al., 1999).

Perceived improvement in training. This variable was measured with a 4-item scale (Balaguer et al., 1999) adapted to the training context. Participants were asked to assess the technical, tactical, physical, and mental aspects of their 'skill improvement in training over the last year'. A year was used as time period, because the data were collected at the start of the new outdoor season, thus responses reflected perceived improvement over a complete outdoor- and indoor season. Responses were made on a Likert scale ranging from l (*about the same as one year ago*), 3 (*somewhat better than one year ago*) to 5 (*much better than one year ago*). In a previous study (Balaguer et al., 2002) the four items (together with a fifth item measuring perceptions of overall performance during the current year) were reported to be internally consistent ($\alpha = .85$). In this study, we only used four items because they covered the four main aspects of improvement.

Perceived performance in competition. This variable was also measured with a 4-item scale used by Balaguer et al. (1999) to measure perceived improvement. We adapted this scale to measure performance by asking the players to assess the technical, tactical, physical, and mental aspects of their 'performance in competition over the last year'. As with improvement, a year was used because the data were collected at the start of the new outdoor season, thus responses reflected perceived performance over a complete outdoor- and indoor

season. Response options were 1 (*poor*), 2 (*fair*), 3 (*good*), 4 (*very good*) and 5 (*excellent*). Similar to the perceived improvement measure, we only used four items because they covered the four main aspects of performance.

Procedure

Upon approval of the study by the University Ethics Committee, we identified tennis players who had experience in training (i.e., training with a coach) and competition (i.e., matches that count for their rating/and ranking) in tennis and were 16 years or older. Forty LTA licensed coaches were contacted via letter or e-mail and a subsequent phone call, and were asked for their help with the study. The general purpose of the study and procedure for data collection was explained to the coaches during the phone call. Questionnaires were sent to the consenting coaches by post ($N = 18$) or delivered by the first investigator ($N = 10$). The questionnaires were administered to the players by their coaches. We emphasized to all coaches both by a telephone conversation (or personal visit) and via written instructions that all players' responses should be kept confidential and revealed to no one including the coach. We also asked coaches to emphasize to their players that they should respond to all questions honestly. All coaches agreed to adhere to these procedures.

During data collection, players were informed of the study purposes by their coach verbally and by the information sheet attached to each questionnaire. It was emphasized that participation in the study was voluntary and players' responses would remain confidential. The coaches were asked to emphasize to their players to complete the training part of the questionnaire with their general training experience in mind and the competition part with their general competition experience in mind. Before completing the questionnaire, which took approximately 10-15 minutes to complete, the athletes signed a consent form. Parental consent was not necessary because in the United Kingdom where the study was conducted

parental consent is needed only under the age of 16 according to the Ethical Guidelines of the British Psychological Society.

Results

Preliminary Analyses

Prior to conducting the main analyses, the data were examined for missing values and outliers. Only 0.5% of the values were randomly missing, and these were replaced with the series mean. Outliers were examined using the standardised *z*-scores. Cases with scores in excess of 3.29 *SD* from the mean were considered outliers (Tabachnick & Fidell, 2001). One outlier was identified, which was standardised by converting the outlier score to 3.29 *SD* from the mean (Field, 2005).

Descriptive Statistics and Alpha Coefficients

Descriptive statistics and alpha coefficients for all variables are presented in Table 2.1. It can be seen that participants reported a high task and moderately high ego orientation and high levels of enjoyment and effort in both contexts. They also reported using goal setting, self-talk, and attentional control with moderate frequency in both contexts. Finally, players reported moderate levels of improvement and performance during the previous year. All scales had good or very good levels of internal consistency.

Correlation Analyses

Bivariate correlations were computed between all variables within each context and are presented in Table 2.2. Task and ego orientations were not related significantly in training, but were positively related in competition. Task orientation was positively related to effort, enjoyment, goal setting, and self-talk in both contexts, perceived improvement in training, and perceived performance and attentional control in competition. Ego orientation was positively linked to enjoyment and effort, in competition. Other notable findings were positive relationships among the three psychological skills, and a positive relationship between

perceived improvement and performance and the three psychological skills in both contexts. Finally, athletes' gender was positively related with task orientation in training (r =.19; p < .05) indicating that females were more task-oriented than males in this context. Correlation values of .10, .30, and .50 are considered small, medium, and large effect sizes, respectively (Cohen, 1992).

Table 2.1

Descriptive Statistics and Alpha Coefficients for All Variables (N=116)

	Training				Competition			
Variables	*M*	*SD*	Range	α	*M*	*SD*	Range	α
Task orientation	4.41	0.48	2.8 - 5.0	74	4.20	0.61	2.3 - 5.0	.81
Ego orientation	3.50	0.79	1.5 - 5.0	.85	3.90	0.75	1.7 - 5.0	.87
Effort	5.71	0.93	3.4 - 7.0	.78	5.99	0.98	2.9 - 7.0	.81
Enjoyment/interest	5.29	0.89	2.7 - 7.0	.79	5.34	1.00	2.6 - 7.0	.83
Goal setting	3.11	0.84	1.0 - 5.0	.84	3.12	0.51	2.0 - 4.5	.78
Self-talk	3.29	0.84	1.0 - 5.0	.85	3.49	0.81	1.1 - 5.0	.80
Attentional control	3.36	0.74	1.0 - 5.0	.79	3.60	0.77	1.8 - 5.0	.83
Perc. Imp[a] /Perc. Perf[b]	3.40	0.99	1.0 - 5.0	.79	3.30	0.68	2.0 - 5.0	.71

Note. Perc. = perceived; [a] Imp = improvement, measured only in training; [b]Perf = performance, measured only in competition.

Table 2.2

Bivariate Correlations among all Variables (N=116)

	1	2	3	4	5	6	7	8	9
1. Task orientation		.40**	.44**	.53**	.28**	.31**	.19*	.31**	.06
2. Ego orientation	.14		.41**	.29**	.09	.11	.04	.17	.33**
3. Effort	.40**	.03		.60**	.09	.32**	.35**	.31**	.16
4. Enjoyment/interest	.20*	−.10	.58**		.24**	.41**	.47**	.38**	.17
5. Goal setting	.32**	−.03	.30**	.24**		.37**	.25**	.23*	.20*
6. Self-talk	.24**	.01	.32**	.24**	.39**		.35**	.45**	.19
7. Attentional control	.01	−.15	.49**	.40**	.28**	.37**		.38**	−.04
8. Perc. Imp[a] / Perc. Perf.[b]	.21*	.10	.28**	.34**	.27**	.43**	.30**		.02
9. LTA rating[c]	.24*	.25*	.16	.22*	.41**	.22*	.01	−.02	

Note. Correlations in training are presented below the diagonal, and those for competition above the diagonal; [a]Perc. = perceived; [a] Imp = improvement, measured only in training; [b]Perf. = performance, measured only in competition; [c]LTA rating, $n = 98$.

* $p < .05$; ** $p < .01$.

Context and Goal Orientations

The first purpose of this study was to examine whether athletes' goal orientations differ across training and competition. We addressed this purpose using dependent *t*-tests and Pearson product-moment correlations. Participants reported significantly higher task orientation in training than in competition, $t(115) = -4.52$, $p < .001$, Cohen's $d = .38$, and significantly higher ego orientation in competition than in training, $t(115) = 6.86$, $p < .001$, Cohen's $d = .52$ (see Table 2.1). Cohen's *d* represents the effect size of the difference in goal orientations between the two contexts, and values of .20, .50, and .80, constitute a small, medium, and large effect, respectively (Cohen, 1992). Thus, the difference between the two contexts was small-to-medium for task and medium for ego orientation. Correlations were large for task orientation ($r = .62$, $p < .001$) and ego orientation ($r = .66$, $p < .001$).

Context and the Relationships between Goals and Motivational Responses

The second purpose of this study was to examine whether goal orientations predict effort, enjoyment, and psychological skill use differently in training and competition. To address this purpose, first we used hierarchical regression analyses to examine the effects of goals on motivational outcomes within each context; we investigated main and interaction effects. When we identified different results in the two contexts, we statistically compared the respective regression coefficients to determine whether the effects of goals on outcomes in the two contexts were significantly different from each other.

Two sets of hierarchical regression analyses, one for training and one for competition, were conducted in two steps using centred predictors (see Aiken & West, 1991). In the first step, the outcome variable was regressed on task and ego goals simultaneously to examine main effects of goals on motivational outcomes. In the second step, the outcome was regressed on the cross-product of task and ego to examine whether the two goals interact in predicting each outcome. The cross-product was computed from the centred predictors to

avoid non-essential multi-collinearity that might result from a high correlation between the first-order terms and the interaction terms (Cohen, Cohen, West, & Aiken, 2003). The two predictors were correlated in competition; therefore, we have also presented the squared semi-partial correlations (sr^2), which express the unique contribution of each predictor to the total variance of each outcome (see Cohen et al., 2003; Tabachnick & Fidell, 2001). To protect against Type I error without increasing the risk of Type II error, we examined significance tests for individual regression coefficients only when the *F* test for the overall model for each regression step was significant (Cohen et al., 2003). First, we present the results for effort and enjoyment/interest followed by the results for psychological skills.

Effort and enjoyment/interest. Results of the regression analyses for effort and enjoyment/interest are presented in Table 2.3. In training, only main effects were found. The overall model was significant for effort, $F(2, 113) = 11.00$, $p < .001$, and enjoyment/interest, $F(2, 113) = 3.53$, $p < .05$. Task orientation predicted positively both variables, whereas ego orientation did not predict any variable. The amount of variance accounted for by the two predictors was medium-to-large for effort and small-to-medium for enjoyment (see Table 2.3). Values of .02, .13, and .26 for R^2 are considered small, medium, and large effect sizes, respectively (Cohen, 1992). In competition, the overall model was also significant for effort, $F(2, 113) = 19.18$, $p < .001$, and enjoyment, $F(2, 113) = 22.51$, $p < .001$. Task orientation predicted positively both variables, while ego orientation predicted positively effort. The two predictors accounted for a large amount of variance in effort and enjoyment (see Table 2.3).

Table 2.3

Regression Analyses: Goals predicting Effort and Enjoyment/interest (N=116)

		Training						Competition					
Outcome		*B*	*SE*	β	*t*	$R^{2\ unique}$	sr^2	*B*	*SE*	β	*t*	$R^{2\ unique}$	sr^2
Effort						.16						.25	
Step 1	Task	.79	.17	.41	4.68***		.16	.52	.14	.33	3.68***		.09
	Ego	−.04	.10	−.03	−0.34		−	.35	.11	.28	3.11**		.06
Step 2	Task x Ego	−.30	.19	−.14	−1.62	.02	.02	−.49	.16	−.25	−3.13**	.06	.06
Enjoyment/interest						.06[a]						.29	
Step 1	Task	.41	.17	.22	2.38*		.05	.80	.14	.49	5.64***		.20
	Ego	−.15	.10	−.14	−1.47		.02	.13	.12	.10	1.10		.01

Note. [a] Cooperative suppression occurred (R^2 is smaller than the sum of sr^2); each predictor was stronger together with the other predictor than independently (for task, $sr^2 = .02 > r^2 = .01$; and ego, $sr^2 = .05 > r^2 = .04$). This occurs when the standardised regression coefficient (β) of the predictors (i.e. task and ego) is greater than their zero-order correlation and both have the same sign; for task orientation both positive, and for ego orientation both negative (Cohen & Cohen, 1975).

*$p < .05$; **$p < .01$; ***$p < .001$.

The overall model was also significant for effort for step 2, $F(3, 112) = 17.05$, $p < .001$, indicating the presence of an interaction effect, which accounted for a small-to-medium amount of unique variance. For the interpretation of an interaction effect, Cohen et al. (2003) recommend to plot the regression of $\hat{Y}$ on X at three levels of Z corresponding to one standard deviation (*SD*) above the mean, the mean, and one *SD* below the mean of Z. Accordingly, the values of task orientation (Z) chosen for plotting the regression of effort ($\hat{Y}$) on ego orientation (X) were 0.61, 0, and − 0.61, reflecting high, mean, and low task orientation, respectively. These values were substituted in the regression equation ($\hat{Y}$ = .47 X + .38 Z −.49 XZ + 6.10), resulting in three simple regression equations, which were then plotted at three levels of ego orientation: one *SD* below the mean (−0.75), the mean, and one *SD* above the mean (0.75). The three simple regression lines are presented in Figure 2.1.

To examine whether the simple slopes were significantly different from zero, simple slope analyses were conducted (Aiken & West, 1991). These analyses showed that the slopes for low ($b = .68$, $SE = .15$, $p < .001$, $t(112) = 4.50$) and mean ($b = .39$, $SE = .11$, $p = .001$, $t(112) = 3.50$) task orientation were significantly different from zero, indicating that for athletes who had low or average levels of task orientation, ego orientation positively predicted effort, that is the higher the ego orientation of these players the more effort they exerted. However, the slope for high task orientation was not significantly different from zero, indicating that when task orientation was high, ego orientation did not predict effort. This interaction effect reflects an antagonistic pattern (Cohen et al., 2003), in which task and ego goals compensate for one another: For high task-oriented athletes, who already exert very high levels of effort in competition, ego orientation has no additional effect on effort; similarly, for high ego-oriented athletes, who already apply high effort in this context, task orientation has no effect.

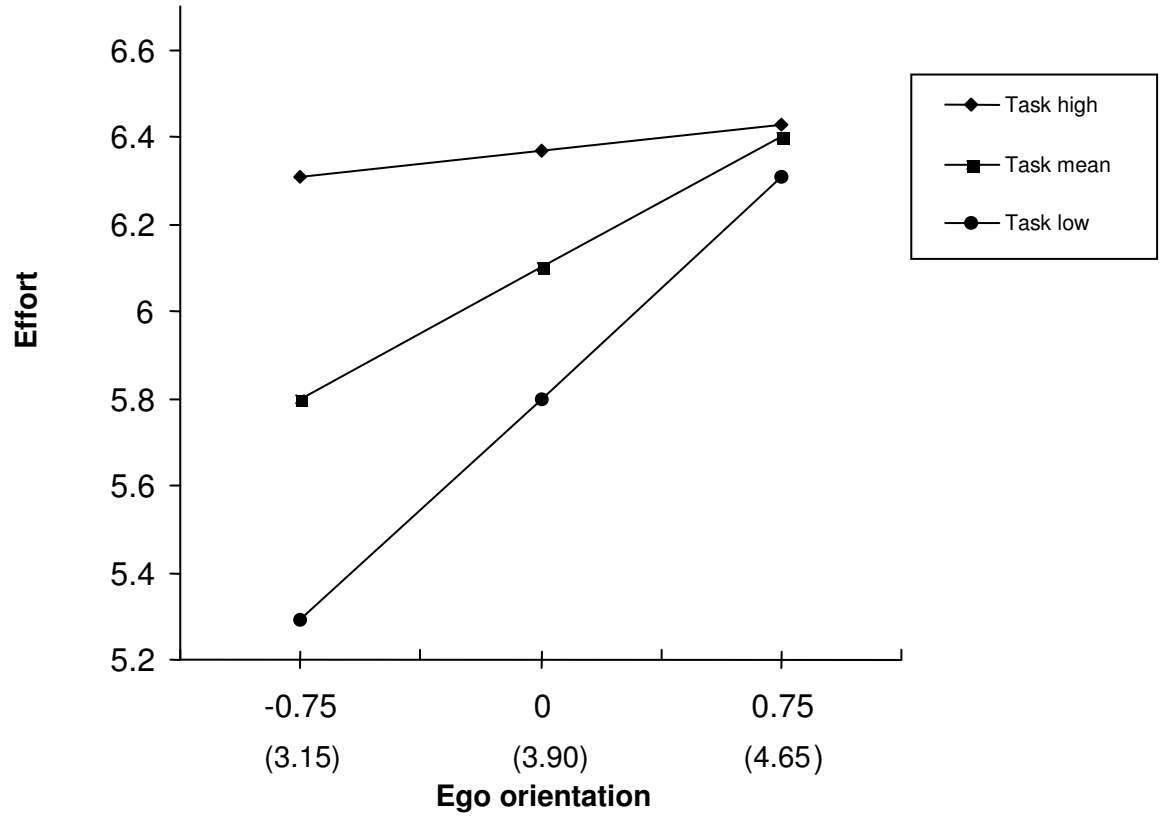

Figure 2.1. Simple regression lines for effort in competition on ego orientation at three values of task orientation.

In order to investigate whether the relationships between goals and effort and enjoyment differed in the two contexts, we conducted a Z-test (Paternoster, Brame, Mazerolle, & Piquero, 1998) to statistically test whether the unstandardized regression coefficients for effort and enjoyment in training and competition were significantly different from each other. This test showed that the regression coefficients for ego orientation on effort ($Z = 2.62$, $p < .01$) were significantly different, while the difference in the coefficients for task orientation on enjoyment/interest approached significance ($Z = 1.77$, $p = .08$). The interaction effect found only in competition also supports the differential effects of the two contexts on effort. These findings suggest that the relationship between goals and effort and enjoyment may depend on the context in which these variables are measured.

Psychological skills. Results of the hierarchical regression analyses for goal setting, self-talk, and attentional control are presented in Table 2.4. Only main effects were significant in the two contexts, therefore only main effects are reported. In training, the overall model was significant for goal setting, $F(2, 113) = 6.68$, $p < .01$, and self-talk, $F(2, 113) = 3.59$, $p < .05$. Task orientation predicted positively both variables, whereas ego orientation did not predict any variable. The two predictors explained a small-to-medium amount of variance in goal setting and self talk. In competition, the overall model was significant for goal setting, $F(2, 113) = 4.73$, $p = .01$, and self-talk, $F(2, 113) = 6.01$, $p < .01$, both of which were positively predicted only by task orientation. The amount of variance explained in this step was also small-to-medium. The overall model for attentional control was not significant, $F(2, 113) = 2.26$, $p = .11$. The Z-test showed that the difference in the unstandardized regression coefficients in the two contexts for task orientation on goal setting ($Z = 1.84$, $p = .07$) approached significance.

Table 2.4

Regression Analyses: Goals predicting Psychological Skills (N=116)

		Training						Competition					
Outcome		*B*	*SE*	β	*t*	$R^{2\ unique}$	sr^2	*B*	*SE*	β	*t*	$R^{2\ unique}$	sr^2
Goal setting						.11						.08	
Step 1	Task	.57	.16	.33	3.64***		.10	.24	.08	.29	2.89**		.07
	Ego	−.08	.10	−.08	−0.85		.01	−.01	.07	−.02	−0.19		−
Self-talk						.06						.10	
Step 1	Task	.43	.16	.25	2.68**		.06	.41	.13	.31	3.23***		.08
	Ego	−.03	.10	−.03	−0.32		−	−.01	.10	−.01	−0.12		−
Attentional Control						.02						.04	
Step 1	Task	.06	.14	.04	0.39		−	.26	.13	.21	2.08*[a]		.04
	Ego	−.15	.09	−.16	−1.69		.02	−.04	.10	−.04	−0.43		−

Note. [a] *F* for this regression set was not significant; i.e., the *t*-test for this regression is not protected from type I error at 0.5 (see Cohen et al., 2003).

*$p < .05$; **$p < .01$; ***$p < .001$.

Goals and Perceived Improvement and Performance

The third purpose of the study was to examine whether goal orientations predict perceived improvement in training and perceived performance in competition and was examined using regression analysis. The overall model was marginally significant for perceived improvement, $F(2, 113) = 2.95$, $p = .056$, and significant for perceived performance, $F(2, 113) = 6.11$, $p < .01$. Task orientation positively predicted perceived improvement ($b = .41$, $SE = .19$, $\beta = .20$, $t = 2.17$, $p < .05$; $R^2 = .05$, $sr^2 = .04$) and perceived performance ($b = .32$, $SE = .11$, $\beta = .29$, $t = 2.95$, $p < .01$; $R^2 = .10$, $sr^2 = .07$), while ego orientation did not predict either variable. The amount of variance in the two variables accounted for by task and ego orientation was small-to-medium.

Discussion

To date, the effects of goal orientations on a variety of motivational responses have been typically examined in the general context of sport, and research has revealed the beneficial effects of task orientation in this context (Biddle et al., 2003). However, athletes constantly make the transition between organised training and competition. These two core sub-contexts of sport could influence not only athletes' tendency to be task or ego involved within each context (see Harwood, 2002), but also the relationship between context-specific goal orientations and motivational responses.

Context and Goals

The first purpose of this study was to examine whether athletes' goal orientations differ across training and competition. Participants reported higher task orientation in training than in competition supporting our hypothesis and findings of other studies that have examined the effects of the two contexts on goal orientation (Tammen, 1998) and goal involvement (Williams, 1998). Participants also reported higher ego orientation in competition than in training; although this finding supports our hypothesis, it is not consistent with studies that

have reported no difference in ego orientation and ego involvement between the two contexts (Tammen, 1998; Williams, 1998). The discrepancy between our findings and those of past research could be explained by athletes' levels of ego goals. The participants in our study and in Williams' (1998) study differed in their level of ego orientation/involvement. Our participants reported moderately high levels of ego orientation, whereas Williams' (1998) participants reported low levels of ego involvement (training, $M = 2.22$, $SD = .94$; competition, $M = 2.11$, $SD = .86$, scale range: 1-5). Given that most of the participants in Williams' (1998) study did not endorse ego goals they may have been less likely to be ego involved in the competition game, which may explain the discrepancy in the findings between the two studies.

We also found high cross-contextual consistency for both task ($r = .62$) and ego ($r = .66$) goal orientations between training and competition, supporting previous research that has also found this consistency between the sport and school domains (Castillo et al., 2009; Duda & Nicholls, 1992). Thus, tennis players who evaluate success using self-referenced or normative criteria in training are more likely to use the same criteria to evaluate their success in competition. The large correlations between training and competition goal orientations suggest that these goals may be expressions of a general (i.e., higher order) tennis goal orientation. However, these correlations were *not* too high also suggesting that training and competition goals are sufficiently independent to merit separate examination. This finding has important implications for the measurement of achievement goals in sport: It indicates that measuring goal orientations in sport in general does not provide sufficiently sensitive information about the criteria athletes use to evaluate success in the specific training and competition contexts. Sport researchers need to keep this point in mind when measuring athletes' goal orientations.

Context, Goals, and Motivational Responses

The second study purpose was to examine whether goal orientations predict effort, enjoyment, and psychological skill use differently in training and competition. Only task orientation positively predicted enjoyment/interest in both contexts. These findings are consistent with the results of past research (Biddle et al., 2003) and suggest that the relationship between task orientation and enjoyment is robust. Previous research has also shown that out of six sources of enjoyment, competence derived through the attainment of personal achievement standards is the most important source for an athlete's enjoyment, whereas competence derived through being better than others and gaining recognition from others is the least important source (Wiersma, 2001). This may explain why task orientation (i.e., the tendency to use self-referenced criteria to evaluate competence) predicted enjoyment in both contexts and why ego orientation (i.e., the tendency to evaluate competence using other-referenced criteria), was unrelated to enjoyment. There was also a tendency for stronger prediction in competition than in training, suggesting that task orientation may be more important for enjoyment in that context. However, this effect was only marginally significant and should be re-examined in future research.

Task orientation was a positive predictor of effort in both contexts, while ego orientation positively predicted this variable only in competition and only when athletes' task orientation was low or average. Thus, although task orientation is clearly the most beneficial goal for effort, the two goals may have compensatory effects (Cohen et al., 2003) in the competition context, that is, high levels in either goal may be sufficient for high effort in competition. It has been suggested that high ego-oriented athletes will apply effort in their striving to demonstrate normative superiority but may withhold effort in the absence of high task orientation (Harwood & Hardy, 2001). In our study, high ego-oriented players exerted high effort even when task orientation was low or average. Perhaps, ego-oriented athletes who

compete individually, as in singles tennis, strongly link the effort they put in a match with a direct gain in normative competence (e.g., 'when I try to do better than my opponent I win the match'). That ego orientation predicted effort differently in the two contexts supports Nicholls' (1989) suggestion that the meaning of effort may change between more learning-oriented (like training) and competitive conditions; it also supports making the distinction between the two contexts when examining the relationship between goal orientations and effort.

With respect to psychological skill use, task orientation was the only goal to positively predict goal setting and self-talk in the two contexts. In past research, athletes with a higher-task/moderate-ego goal profile used goal setting and self-talk more often in the two contexts compared to lower-task/higher-ego and moderate-task/lower-ego athletes (Harwood et al., 2004). Our findings extend this work by revealing how goal orientations that are *specific* to training and competition are related to the use of these two psychological skills in the two contexts, and suggest that task orientation is the key goal associated with the use of goal setting and self-talk in the two contexts. Harwood et al. (2004) have also argued that athletes high in ego orientation may also invest in psychological skills use to facilitate their goal of demonstrating normative competence, and therefore no differences would be expected in psychological skills use as a function of achievement goal orientation. However, our findings suggest that ego orientation is neither beneficial nor detrimental for these variables. There was also a tendency for a stronger prediction of goal setting by task orientation in training than in competition, which should be further examined in future research.

Attentional control was not predicted by either goal in either context. In past research, task orientation has predicted concentration, which is similar to attentional control, in physical education (Papaioannou & Kouli, 1999). The discrepancy in the findings could be explained by the different ways that attentional control and concentration were measured in the two

studies. Specifically, Papaioannou and Kouli (1999) measured concentration at a specific moment in time, that is, they asked participants to think about the drill that they just did. In contrast, we examined the effective use of attentional control in the general training and competition contexts. As different performance situations may place different demands on attentional control, it is possible that achievement goals have less implication for this psychological skill when examined at a more general level.

Goals and Perceived Improvement and Performance

Task orientation positively predicted improvement in training. Previous research has also shown that this goal positively predicted players' perceived improvement in handball (Balaguer et al., 2002). Our findings extend this work to tennis and suggest that task orientation should be promoted if one wishes to enhance perceptions of improvement in training. However, as the overall model for improvement was marginally significant this finding must be interpreted with caution. Ego orientation was not related to perceived improvement, a finding consistent with previous research (Balaguer et al., 2002). Overall, these findings are consistent with Nicholls' (1989) proposition that task orientation should facilitate long-term involvement which is required to improve skills.

Only task orientation predicted positively perceived performance in competition. In past research, task orientation has been positively related to tennis players' perceptions of performance in one match (Cervelló et al., 2007), and football players' coach-rated performance at the start and over the course of the season (Van Yperen & Duda, 1999). The current study extends this work by identifying a relationship between goal orientations and perceived performance over a *long* time period. Our findings suggest that using self-referenced criteria to define success and evaluate competence is more likely to lead to high performance in competition as perceived by the athlete. In contrast, using normative criteria to evaluate success has no impact on perceived performance in competition.

Limitations of the Study and Directions for Future Research

Although our research revealed some interesting findings, it also has some limitations which need to be considered when interpreting the findings. First, the study was cross-sectional, thus firm assertions about the direction of causality cannot be made. Experimental studies are needed to confirm the direction of causality in the relationships that we found. For example, researchers could assign participants in pairs to training (i.e., instruct them to practise a motor skill) followed by competition (i.e., ask them to compete with each other on the skill they practised) conditions and examine how achievement goals change from the one condition to the other. Second, all study participants were British tennis players and most of them were males; thus, our findings can be generalized only to a similar population. Future research should replicate the present findings in other sports and countries using a larger number of female athletes. Third, the order of presentation of the questionnaires was not counterbalanced. Future research should replicate the current findings by varying the order of questionnaires. Finally, researchers could examine whether perceived ability moderates the relationship between ego orientation and outcomes in the two contexts thereby fully testing Nicholls' (1989) predictions about the moderating role of perceived ability. We did not examine this issue because empirical research has offered limited support for these predictions (see Biddle et al., 2003; Elliot, 1999; Morris & Kavussanu, 2009).

Conclusion

In conclusion, our findings suggest that the two core sub-contexts in sport - training and competition - may influence tennis players' tendencies to be task or ego involved within each context. Our findings also indicate that task orientation is the goal that should be promoted and maintained in both contexts, and that the context may have some influence on the relationship between goal orientations and motivational outcomes. Moreover, task and ego orientation compensate for each other in their prediction of effort in competition. These

findings may provide practitioners with insights to optimise athletes' motivation in the training and competition contexts.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Ames, C. (1992). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), *Motivation in Sport and Exercise* (pp. 161-177). 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 and Science in Sports, 9,* 381-388.

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3,* 1-20.

Castillo, I., Duda, J. L., Balaguer I., & Tomás I. (2009). Cross-domain generality of achievement motivation across sport and the classroom: the case of Spanish adolescents. *Adolescence, 44,* 569-580.

Cervelló, E., Santos-Rosa, F., García Calvo, T., Jiménez, R., & Iglesias, D. (2007). Young tennis players' competitive task involvement and performance: the role of goal orientations, contextual motivational climate, and coach-initiated motivational climate. *Journal of Applied Sport Psychology, 19*, 304-321.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, J., & Cohen, P. (1975). *Applied multiple regression/correlation for the behavioral sciences*. New York: Wiley.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression / correlation analysis for the behavioral sciences* (3rd ed.). London: Lawrence Erlbaum Associates.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

Duda, J.L., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290-299.

Elliot, A. J. (1999). Approach and avoidance motivation and achievement goals. *Educational Psychologist, 34,* 169-189.

Field, A. (2005). *Discovering statistics using SPSS* (2nd edition). London: Sage.

Gould, D., Medbery, R., Damarjian, N., & Laurer, L. (1999). A Survey of mental skills training knowledge, opinions, and practices of junior tennis coaches. *Journal of Applied Sport Psychology 11*, 28-50.

Harwood, C. G. (2002). Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *Journal of Applied Sport Psychology, 14*, 106-119.

Harwood, C. G., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology, 16*, 318-332.

Harwood, C. G., & Hardy, L. (2001). Persistence and effort in moving achievement goal research forward: A response to Treasure and colleagues. *Journal of Sport & Exercise Psychology, 23,* 330-345.

Harwood, C. G., Hardy, L., & Swain, A. (2000). Achievement goals in sport: A critique of conceptual and measurement issues. *Journal of Sport & Exercise Psychology, 22*, 235-255.

Jackson, S.A., & Csikszentmihalyi, M. (1999) *Flow in sports.* Human Kinetics, Champaign, IL.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60,* 48-58.

Moreno, J.A., Cervelló, E., & González-Cutre, D. (2008). Relationships among goal orientations, motivational climate and flow in adolescent athletes: Differences by gender. *The Spanish Journal of Psychology, 11*, 181-191.

Morris, R. L., & Kavussanu, M. (2009). Approach-avoidance achievement goals in sport: Psychological correlates and a comparison with the dichotomous model. *International Journal of Sport & Exercise Psychology, 9,* 185-202.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328-346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Papaioannou, A. G., & Kouli, O. (1999). The effect of task structure, perceived motivational climate and goal orientation on students' task involvement and anxiety. *Journal of Applied Sport Psychology, 11,* 51-71.

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. *Criminology, 36*, 859-866.

Roberts, G. C., Treasure, D. C., & Balaguer, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16,* 337-347.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43,* 450-461.

Singer, R.N, Cauraugh, J.H. Murphey, M, Chen, D., & Lidor, R. (1991). Attentional control, distractors, and motor performance. *Human Performance, 4*, 55-69.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

Tammen, V.V. (1998). Changes in task and ego goal orientations in relation to training of competitive situations. *Journal of Sport & Exercise Psychology, 20* (Suppl.), S120.

Thomas, P. R., Murphy, S. M., & Hardy, L. (1999). Test of performance strategies: Development and preliminary validation of a comprehensive measure of athletes' psychological skills. *Journal of Sports Sciences, 17,* 697-711.

Van Yperen, N. W., & Duda, J. L. (1999). Goal orientations, beliefs about success, and performance improvement among young elite Dutch soccer players. *Scandinavian Journal of Medicine and Science in Sports, 9,* 358-364.

Wiersma, L. D. (2001). Conceptualization and development of the Sources of Enjoyment in Youth Sport Questionnaire. *Measurement in Physical Education and Exercise Science, 5,* 153-177.

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47-57.

CHAPTER THREE

Study two: Goal Orientations, Perceived Motivational Climate, and Motivational Outcomes in Football: A Comparison between Training and Competition Contexts.

Abstract

Objectives: In this study, we examined (a) differences and (b) consistency in football players' goal orientations and perceptions of motivational climate across the training and competition contexts and (c) whether the context moderates the relationship between goal orientations and perceptions of the motivational climate and three outcomes: effort, enjoyment and tension.

Method: Football players (362 males and 48 females) completed questionnaires measuring goal orientations, perceived motivational climate, effort, enjoyment, and tension in training and competition.

Results: Participants reported higher ego orientation and perceptions of performance climate in competition than in training at both the overall and within-person levels. Task orientation varied only at the within-person level, while no difference was found for perceived mastery climate between the two contexts. Task orientation predicted effort and enjoyment positively in both contexts and tension negatively in training. Ego orientation predicted tension negatively in training only when perceived performance climate was high. Mastery climate predicted effort and enjoyment positively in both contexts, while performance climate predicted tension positively in training and effort negatively in competition. Thus, in several cases, the prediction of effort, enjoyment and tension by goal orientations and motivational climate differed depending on the context.

Conclusion: The findings highlight the importance of distinguishing between the training and competition contexts when examining achievement motivation in sport.

Introduction

In the last two decades, Achievement Goal Theory (e.g., Ames, 1992a; Nicholls, 1989) has been the main theory used to understand motivation in sport. According to this theory, individuals engage in achievement contexts in order to develop or demonstrate competence (Nicholls, 1989). However, competence or ability can be evaluated using self or other-referenced criteria, thus two conceptions of ability operate in achievement contexts (Nicholls, 1984, 1989). These two conceptions of ability are embedded within two distinct achievement goals, namely *task* and *ego involvement* (Nicholls, 1984, 1989). When individuals are task involved, they evaluate competence using self-referenced criteria and feel successful when they learn something new, master a task, or improve their skills. In contrast, when they are ego involved, they evaluate competence using other-referenced criteria and feel successful when they establish superiority over others (Nicholls, 1989). People have a proneness to the two types of involvement known as *task* and *ego orientation* (Nicholls, 1989). Task orientation has been related to a variety of positive motivational consequences in sport, whereas ego orientation has been linked to less desirable consequences (see Biddle, Wang, Kavussanu, & Spray, 2003; Harwood, Spray, & Keegan, 2008).

Contexts, Goal orientations and Motivational climate

To date, the vast majority of sport research stemming from the achievement goal framework has been conducted in the broad domain of sport. However, this domain can be subdivided into training and competition contexts; these contexts entail conditions that could differentially promote task or ego involvement: As an organised structure, training typically provides opportunities for athletes to practise and develop their skills, whereas organised competition is formally regulated so that athletes test these skills against other athletes. Normative comparison may take place in training; however, it is inherent in competition because in this context outperforming other athletes is objectively rewarded (e.g., normative

rankings based on win/loss records). Hence, the structural characteristics of training and competition may influence the extent to which athletes adopt task and ego involvement in each context; this may lead them to develop the tendency to evaluate success that is specific to each context.

To date, very few studies have examined achievement goals in training and competition. In one study, female softball players were more task-involved before a training session than before a competitive game, but did not differ in ego involvement (Williams, 1998). Similarly, athletes (from an unspecified sport) reported higher task orientation in training than in competition but no difference in ego orientation (Tammen, 1998), while tennis players reported higher task *and* lower ego orientation in training than in competition (van de Pol & Kavussanu, 2011). Finally, athletes from a variety of sports reported higher ego and lower task orientation in competition than in the general context of sport (Harwood, 2002). Thus, there is value in distinguishing between training and competition contexts when one examines achievement goals in sport.

A second variable that could vary between training and competition is the *motivational climate,* which refers to the situational goal structure operating in an achievement context (Ames, 1992b). The motivational climate has been distinguished in *mastery climate* where the emphasis is on effort, personal improvement, and skill development and *performance climate* where the emphasis is on normative comparison and public evaluation (Ames, 1992a). The motivational climate is created by significant others such as teachers, parents and coaches (Ames, 1992a). In this study, we use the term motivational climate to refer to the coach-created climate and in line with past work (e.g., Newton, Duda, & Yin, 2000) we will examine motivational climate via athlete perceptions. In sport, perceptions of a mastery climate have been associated with adaptive motivational patterns, whereas perceptions of a

performance climate have been consistently linked to maladaptive motivational patterns (Harwood et al., 2008; Ntoumanis & Biddle, 1999).

To date, no study has investigated whether perceived motivational climate varies between the training and competition contexts. The win/loss records and ranking systems that are salient in competition and the presence of spectators who often focus on normative success may lead coaches to put more emphasis on normative criteria in that context, thereby creating a higher performance climate in competition than in training. Mastery climate may not vary between the two contexts because coaches should reward effort and encourage personal improvement in both contexts. This is because effort is beneficial for both skill development that occurs in training and high level performance for which athletes strive in competition, and personal improvement should facilitate achievement success in both contexts. Thus, differences between the two contexts may exist in performance motivational climate but not mastery motivational climate.

Another issue that has received very little research attention is whether goal orientations and perceived motivational climate in training are related to their respective constructs in competition. This is important because the strength of the relationship would indicate whether goals and climate in the two contexts are sufficiently distinct to merit separate examination. No study has examined this issue with respect to perceived motivational climate and only one study has investigated goal orientations. Specifically, van de Pol and Kavussanu (2011) found a strong positive relationship between training and competition goals in tennis players (r = .62 for task and r = .66 for ego orientation). Similar relationships have been reported between school and sport goal orientations (e.g., Duda & Nicholls, 1992). However, it is not known whether goal orientations are relatively stable across the training and competition contexts in other sports or whether similar cross-context relationships exist in athletes' perceptions of motivational climate.

Goal Orientations, Motivational Climate and Outcomes in two Contexts

The distinction between training and competition may also have implications for the relationship between goal orientations and effort, enjoyment, and tension. Although ego orientation has been typically unrelated to effort and enjoyment and positively linked to tension in sport (see Biddle et al., 2003 for a review), its relationship with these outcomes may differ depending on the context. In training, ego orientation should be unrelated to effort, enjoyment and tension because in this context normative success is not *formally* rewarded and may be less strongly emphasized. Therefore, highly ego-oriented athletes may not work hard, enjoy training, or feel pressure as they may perceive a lack of challenge to demonstrate normative competence in this context. In competition, ego-oriented athletes should apply effort because this is the ideal context for these athletes to demonstrate normative competence (Harwood & Hardy, 2001). As they derive positive affect from normative success (Treasure & Roberts, 1994), their enjoyment should also depend on such success, but because on average there is a balanced win/loss ratio, ego orientation should be unrelated to enjoyment in this context. Finally, the normative success criteria embedded in competition could make high ego-oriented athletes worried about receiving an approving evaluation leading them to experience more tension in this context.

The relationship between task orientation and effort, enjoyment and tension should not vary between the two contexts. In sport, task orientation has been associated with greater effort and enjoyment, and lower tension (Biddle et al., 2003). The training context is the ideal environment for task-oriented athletes, who have an intrinsic interest and desire to improve (Nicholls, 1989), to feel successful as in this context they have the opportunity to practise and develop their skills. Competition is also a context in which task-oriented athletes should exert effort and experience enjoyment in their pursuit of their self-referenced goals (e.g., personal

bests). As these athletes evaluate their competence in relation to their own previous performance, this should reduce potential tension in both contexts.

Only one study has examined whether the training versus competition context moderates the relationship between goal orientations and motivational outcomes (van de Pol & Kavussanu, 2011) and found that in tennis players, task orientation predicted effort and enjoyment positively in both contexts, whereas ego orientation predicted effort positively only in competition and only when task orientation was low or average. Interestingly, task orientation was a stronger positive predictor of enjoyment in competition than in training. These findings suggest that the context may moderate the relationship between goal orientations and various outcomes in sport.

The context may also influence the relationships between perceived motivational climate and effort, enjoyment, and tension. In both training and competition, mastery climate should predict effort and enjoyment positively and tension negatively (Harwood et al., 2008; Ntoumanis & Biddle, 1999). In both contexts, performance climate should be maladaptive to all outcomes (Harwood et al., 2008; Ntoumanis & Biddle, 1999). However, performance climate may be more prominent in competition than in training, which should strengthen the negative impact of this climate on motivational outcomes in competition. Thus, perceived performance climate is expected to negatively influence motivational outcomes in training *and* competition, however with stronger negative effects in the competition context.

Finally, goal orientations and perceived motivational climate may interact with each other in predicting effort, enjoyment and tension (Dweck & Leggett, 1988). In a physical education context, high task-oriented students had higher intrinsic motivation (e.g., 'fun of discovering new skills') when they perceived a strong mastery climate, but lower intrinsic motivation when they perceived a weak mastery climate (Standage, Duda, & Ntoumanis, 2003). However, no interaction effects were found between task and ego goal orientations

and perceived motivational climate on effort, enjoyment and tension in a study of female volleyball players (Newton & Duda, 1999). Therefore, research is needed to examine interaction effects between goal orientations and motivational climate on effort, enjoyment, and tension. Making the distinction between training and competition contexts may reveal such interactions.

The Present Study

In sum, the distinction between training and competition contexts when examining goal orientations, motivational climate and motivational outcomes in sport has received little attention. The present study was designed to address this gap in the literature in the sport of football. We focused on football because (a) no study has examined goal orientations in training and competition and their relationship with motivational outcomes in this sport, and (b) football is the most popular team sport in the UK, thus, the findings have implications for many individuals.

The study had three purposes: First, to examine differences in goal orientations and motivational climate across training and competition. Based on previous research (Harwood, 2002; van de Pol & Kavussanu, 2011), we hypothesized that football players would report higher task and lower ego orientation in training than in competition. We also expected higher perceptions of performance climate in competition than in training but no difference in perceived mastery climate. The second purpose was to investigate the extent to which goal orientations and perceived motivational climate in training are related to their respective variables in competition (i.e., cross-contextual consistency). We hypothesized strong - but not too high - positive relationships between training and competition variables (van de Pol & Kavussanu, 2011).

The third purpose was to examine whether the context moderates the relationships between goal orientations and motivational climate and effort, enjoyment and tension. We

hypothesized that task orientation would predict effort and enjoyment positively and tension negatively, in both contexts (Biddle, et al., 2003; van de Pol & Kavussanu, 2011); that ego orientation would be unrelated to all motivational outcomes in training, predict effort and tension positively in competition (e.g., van de Pol & Kavussanu, 2011), and be unrelated to enjoyment in competition. We expected that mastery climate would predict effort and enjoyment positively and tension negatively in both contexts; the reverse relationships were expected for performance climate (Ntoumanis & Biddle, 1999). No specific hypotheses were formed with regard to potential interactions between goal orientations and motivational climate and motivational outcomes in each context as previous research has reported mixed findings for similar interaction effects in sport and physical education (e.g., Newton & Duda, 1999; Standage et al., 2003).

Method

Participants

Participants were 410 (362 males, 48 females) football players, recruited from 33 football teams in the United Kingdom. The players' mean age was 21.11 (*SD* = 4.34) years and they had been playing football competitively for an average of 11.68 (*SD* = 4.55) years. Most players competed at club level (93 %), with few competing at county (2 %) and regional (5 %) levels. On average, they attended 1.5 (*SD* = .57) training sessions per week. At the time of data collection, the number of competitive matches they had played that season varied from 1 to 5 (14 %), 5 - 10 (41 %), 10 -15 (17 %), 15 - 20 (10 %), to 20 or more (18 %). Finally, the average period that the players were coached by their current coach was 1.65 years (*SD* = 1.12).

Measures

We used a questionnaire which was divided into two major sections, one referring to training and one referring to competition. The players were oriented toward the two contexts

through written instructions (e.g., "Please think about your football experience in *training*, and respond honestly to the following statements…"). A similar procedure has been used in previous research that examined goal orientations in school and sport (e.g., Duda & Nicholls, 1992). For all measures we used identical items for both contexts.

Goal orientations. Athletes' goal orientations in the training and competition contexts were assessed with the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which consists of two 6-item subscales measuring task and ego orientations. Participants were asked when they feel most successful in training/competition. The stem for each item was "In training/competition, I feel most successful when…". Example items were "I work hard" for task orientation and "I outperform others" for ego orientation. Participants responded on a Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The POSQ has demonstrated very good internal consistency with Cronbach's (1951) alpha coefficients of .90 for the task and .84 for the ego orientation subscales (Roberts et al., 1998). The mean for each subscale was computed and used in all analyses. This procedure was followed for all variables.

Perceived motivational climate. Perceived motivational climate was assessed with an adapted version of the Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, et al., 2000), which measures perceptions of mastery (17 items) and performance climate (16 items). In the present study, we used only 8 items from the mastery climate subscale and 8 items from the performance climate subscale because only these items referred to coach behaviours, and were relevant to both contexts. Abbreviated versions of the PMCSQ-2 have been used in previous research (e.g., Kavussanu & Spray, 2006). The stem was: "During training/competition, on this team the coach …", and example items are: "…rewards trying hard" for mastery climate, and "...gives most of his or her attention to the stars" for performance climate. Responses were made on a Likert scale ranging from 1

(*strongly disagree*) to 5 (*strongly agree*). The PMCSQ-2 has demonstrated very good internal consistency with alpha coefficients of .88 and .87 for the mastery and performance subscales respectively (Newton et al., 2000).

Effort, enjoyment/interest and tension. Three subscales of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) were used to measure effort (5 items), enjoyment/interest (7 items) and tension/pressure (5 items). Participants were asked to think about their experiences during training/competition when responding to the items. Example items used in the present study are: "I put a lot of effort into training/competition", "I enjoy training/competition very much", and "I feel pressured during training/competition", for effort, enjoyment, and tension, respectively. Each item was rated on a Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). These subscales have demonstrated satisfactory to very good reliability in previous research (effort, $\alpha = .84$; enjoyment, $\alpha = .78$; tension, $\alpha = .68$, McAuley, Duncan, & Tammen, 1989).

Procedure

Upon approval of the study by the University Ethics Committee, we identified 33 football teams, and contacted the coaches of these teams to request their help with the study. The general study purpose and procedure for data collection was explained to the coaches during a phone call. Data collection took place 2-3 months after the season had started. Questionnaires were administered by a research assistant during a training session; before completing them, the players signed a consent form. Players were informed of the study purposes verbally by the research assistant and via the information sheet attached to each questionnaire. It was emphasized that participation in the study was voluntary and participants' responses would remain confidential. Finally, the players were asked to think about how they *usually* experience training and competition when they complete the respective parts of the questionnaire.

Results

Preliminary Analysis

Preliminary analysis revealed that 0.7 % of the values were randomly missing across the data. When less than 5 % of the data are randomly missing from a large data set, almost any procedure for replacing missing values yields similar results (Tabachnick & Fidell, 2001). Accordingly, the missing values were replaced with the series mean of the individual items. Outliers were examined using standardised *z*-scores; cases with scores in excess of 3.29 *SD* from the mean of the subscale were considered outliers (Tabachnick & Fidell, 2001). In the entire data set, eight outliers were found and removed. Table 3.1 presents the descriptive statistics and alpha coefficients for all variables; all scales showed good-to-very-good internal consistency. Table 3.2 shows the correlations among all the variables within each context.

Table 3.1

Descriptive Statistics and Alpha Coefficients for all Variables (N=410)

	Training				Competition			
Variables	*M*	*SD*	Range	α	*M*	*SD*	Range	α
Task orientation	4.15	0.53	2.33-5.00	.81	4.15	0.53	2.67-5.00	.78
Ego orientation	3.55	0.77	1.50 - 5.00	.89	3.85	0.73	1.50-5.00	.88
Mastery climate	3.70	0.52	1.96 - 5.00	.78	3.70	0.53	2.25-5.00	.79
Performance climate	2.49	0.75	1.00 - 4.62	.85	2.71	0.80	1.00-5.00	.88
Effort	5.38	1.01	2.40 - 7.00	.84	5.76	1.01	2.80-7.00	.82
Enjoyment/Interest	4.82	0.94	2.00 - 7.00	.83	5.28	0.83	2.57-7.00	.78
Tension	2.79	1.15	1.00 - 6.00	.81	3.95	1.17	1.00-7.00	.80

Note. Possible range of the scales: goals and motivational climate: 1-5; effort, enjoyment/interest, and tension: 1-7.

Table 3.2

Bivariate Correlations among Variables in Training and Competition (N=410)

	1	2	3	4	5	6	7	8
1. Task orientation		.45**	.41**	−.10*	.35**	.31**	.03	.05
2. Ego orientation	.21**		.18**	.17**	.25**	.13*	.02	−.19**
3. Mastery climate	.37**	.09		−.11*	.37**	.31**	.03	.09
4. Performance climate	−.26**	.14**	−.29**		−.17**	−.15**	.10*	−.10*
5. Effort	.38**	.10*	.42**	−.22**		.71**	.03	.02
6. Enjoyment/interest	.31**	.08	.48**	−.21**	.64**		−.05	.04
7. Tension	−.17**	−.15**	−.11*	.27**	−.23**	−.25**		.16**
8. Gender	.07	−.14**	.05	−.06	.02	.04	.04	

Note. Correlations among variables in training are presented below the diagonal, and those for competition above the diagonal. Gender was coded as '1' for males and '2' for females. * $p < .05$; ** $p < .01$.

Differences and Consistency between Contexts

The first two study purposes were to examine goal orientations and perceived motivational climate across training and competition. Specifically, we examined (a) *differences* and (b) *consistency* in the four variables between contexts. Prior to addressing these purposes we explored the data by inspecting the scatter plots of goal orientations and perceived motivational climate (see Figure 3.1). In each plot, every data point (i.e., filled circle) represents the intersection of an athlete's training (*x* axis) and competition (*y* axis) scores. The small number of data points is due to many athletes having the same scores. Each plot shows a solid line, which represents the best-fitting regression line, and a dotted

line, which represents the equality line; data points below, on, or above the equality line indicate that scores were higher, the same, or lower, in training than in competition. It can be seen that task orientation scores were spread evenly around the equality line; ego orientation scores covered a broad range and most of them were above the line; mastery climate scores were clustered evenly around this line; and performance climate scores were broadly distributed and most of them were above the equality line.

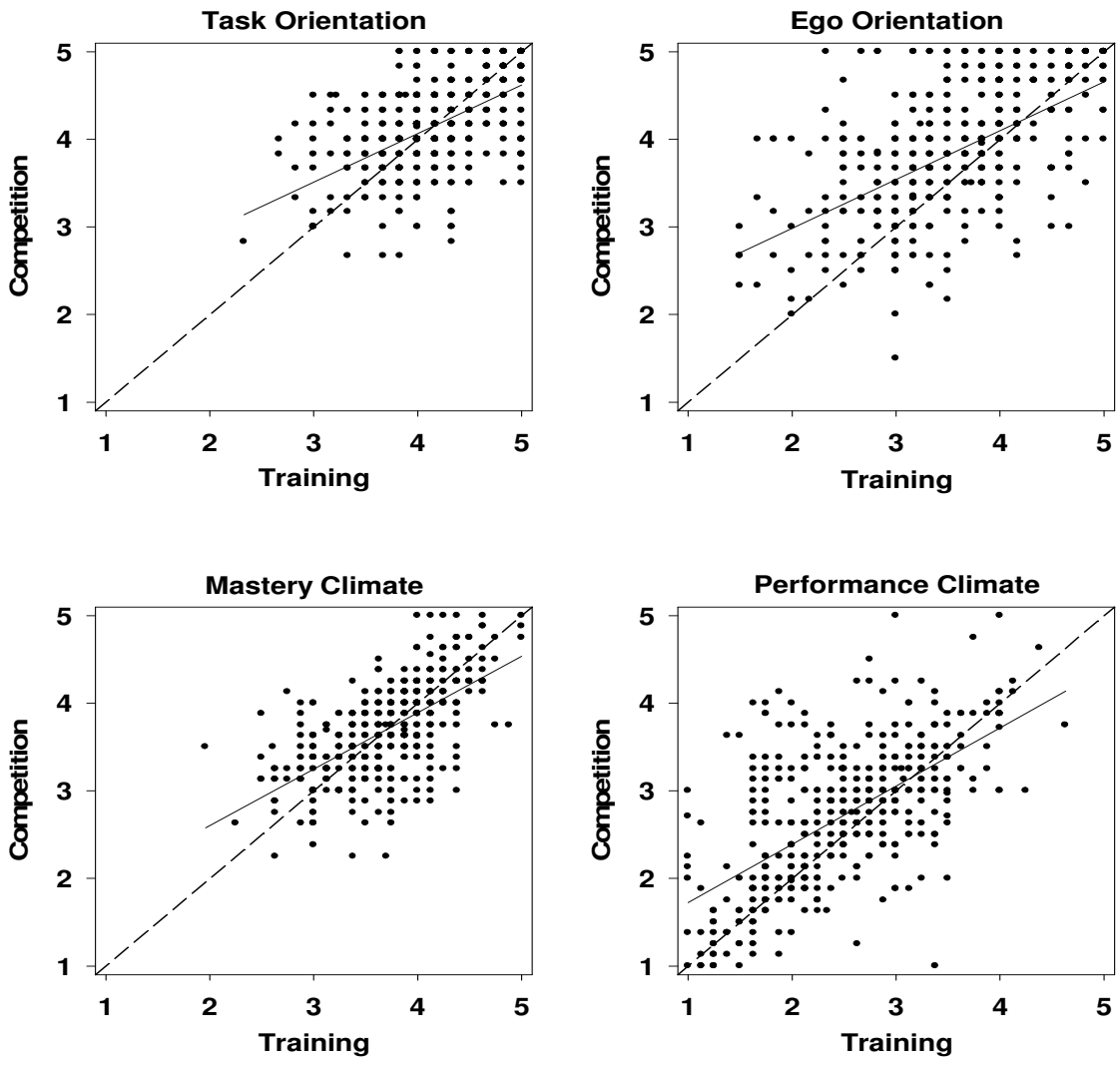

Figure 3.1. Plots of goals and climate scores ($N = 410$) in training and competition with line of equality (dashed) and regression line (solid).

Differences between Contexts. We examined differences in goal orientations and motivational climate between the two contexts at the overall and within-person levels. At the overall level, we compared participants' average scores between contexts. As can be seen in Table 3.3, dependent *t*-tests revealed that ego orientation and performance climate were higher in competition than in training. The effect size was small-to-medium for both variables (see Cohen, 1992). Task orientation and mastery climate did not differ significantly across the two contexts.

At the within-person level, we examined whether individual athletes showed significant differences in goals and climate between contexts using a procedure utilized in past research to examine stability and change of students' achievement goals in three examinations (Fryer & Elliot, 2007). First, we computed the Reliable Change Index (RCI; see Jacobson & Truax, 1991) for each athlete by dividing the difference between his/her training and competition scores by the standard error of this difference. With alpha set at $p = .05$, RCI values smaller or greater than 1.96 indicate reliable change (i.e., outside the 95% confidence intervals) from training to competition. Training was chosen as the starting or reference point; this choice was arbitrary and had no meaningful effect on the results. Scores were reliably higher in competition than training for 2.0–8.3%, and lower in competition than training for 0.7–5.4%, of participants (see Table 3.3).

Then, we examined whether the variables differed between the two contexts. If differences occurred by chance, the distribution of RCI values should be normal: with 2.5% below −1.96, 95% between −1.96 and 1.96, and 2.5% above 1.96. As Table 3.3 shows, the distribution of task orientation scores was less peaked compared to the normal distribution, that is, players' task orientation tended towards both directions (i.e., lower in training than in competition, and vice versa). The distributions of ego orientation and performance climate were negatively skewed, that is, players reported higher ego orientation and perceived

performance climate in competition that in training. Chi-square tests confirmed that all variables except for mastery climate differed significantly between the two contexts (see Table 3.3).

Table 3.3

Differences in Goal Orientations and Perceived Climate from Training to Competition (N=410)

	Overall differences		Within-person differences (RCI)			
Variable	*t(409)*	Cohen's *d*	% lower	% same	% higher	$\chi^2(2)$
Task orientation	–0.05	0.0	5.4	90.5	4.1	18.79***
Ego orientation	8.80 ***	0.40	1.7	90	8.3	57.14***
Mastery climate	–0.07	0.0	3.9	94.1	2.0	3.75
Performance climate	6.71 ***	0.28	0.7	92	7.3	43.58***

Note. RCI = Reliable Change Index. Difference scores were computed as competition minus training score.

***$p \leq .001$.

Cross-contextual consistency. We examined consistency in goals and climate between the two contexts by computing Pearson correlations between the two context scores. We found large positive correlations for all variables: task orientation, $r = .56$, $p < .001$; ego orientation, $r = .59$, $p < .001$; mastery climate, $r = .64$, $p < .001$; performance climate, $r = .62$, $p < .001$ (see Cohen, 1992, for correlation effect sizes).

Goals, Climates, and Motivational Outcomes

The third study purpose was to examine whether the context moderates the relationship between goal orientations and motivational climates on the one hand and effort, enjoyment and tension on the other. To address this purpose we, first, used regression analysis to examine whether the goals and climates predicted effort enjoyment and tension within each

context. Then, we tested whether goals and climates predicted these outcomes differently in the two contexts, by statistically comparing the relevant regression coefficients.

Regression analyses. To examine whether the goals and climates predict effort, enjoyment and tension within each context, we conducted two sets of hierarchical regression analyses, one for training and one for competition, using mean-centred predictors (see Aiken & West, 1991). We entered task and ego orientations in the first step, because our main interest was whether goal orientations predict the outcomes (see Cohen, Cohen, West, & Aiken, 2003). Mastery and performance motivational climates were entered in the second step, two-way interactions in the third step, and three-way interactions in the fourth step. Interaction terms were formed by multiplying the respective centred predictors. For example, the product of task and ego orientations represented the interaction between these two variables. Next, to permit a more powerful test of the significant interaction effects in each model a sequential step-down approach was used: Starting with the highest-order term in the regression equation, the non-significant interactions were removed one at a time and each subsequent term was tested for significance (Aiken & West, 1991). A Bonferroni adjustment was applied to control the family-wise error rate with multiple comparisons resulting in an adjusted alpha of .005 (Aiken & West, 1991).

Results of these analyses are presented in Table 3.4. For effort, we found only main effects. Task orientation and mastery climate positively predicted effort in both contexts; ego orientation did not predict effort in either context; and performance climate negatively predicted effort only in competition. For enjoyment, we also found only main effects: Task orientation and mastery climate positively predicted enjoyment in both contexts; ego orientation and performance climate did not predict enjoyment in either context. For tension, we observed both main and interaction effects, albeit only in training: Tension was predicted

negatively by task orientation, positively by performance climate and negatively by the ego orientation and performance climate interaction.

The interaction effect was explored by plotting the regression of tension on ego orientation at two levels of performance climate, corresponding to one standard deviation (*SD*) below (−0.75) and one *SD* above (0.75) the mean of performance climate. These values were substituted in the regression equation ($\hat{Y} = -.30\ X + .44\ Z - .25\ XZ + 2.81$), resulting in two simple regression equations, which were then plotted at two values of ego orientation: one *SD* below (−0.77) and one *SD* above (0.77) its mean. We also examined whether the simple slopes of these regression lines were significantly different from zero. As Figure 3.2 shows, when players perceived a high performance climate in their team, ego orientation was a significant negative predictor of tension ($b = -.49$, $SE = .10$, $p < .001$, $t\ (406) = -4.80$). In contrast, when they perceived a low performance climate, ego orientation did not predict tension. This interaction reflects a *buffering* pattern (Cohen et al., 2003), in which the two regression coefficients for ego orientation ($b = -.30$) and performance climate ($b = .44$) have opposite signs: As ego orientation increases, the effect of perceived performance climate on tension is diminished.

Comparing regression coefficients between contexts. We tested whether goals and climates predicted effort, enjoyment and tension differently between the two contexts by comparing regression coefficients with a *Z*-test (Paternoster, Brame, Mazerolle, & Piquero, 1998). None of the regression coefficients for effort differed between the two contexts. However, we found significant differences between the two contexts in the coefficients for the effect of: mastery climate on enjoyment ($z = -3.49$, $p < .001$); task orientation ($z = 2.21$, $p < .05$) and performance climate ($z = -2.63$, $p < .01$) on tension; and the interaction between ego orientation and performance climate ($z = 2.09$, $p < .05$) on tension.

Table 3.4

Goal Orientations and Perceived Climates predicting Motivational Outcomes (N = 410)

	Training				Competition			
Outcome	*B*	*SE*	β	$R^{2\text{Unique}}$	*B*	*SE*	β	$R^{2\text{ Unique}}$
Effort								
Step 1				.14***				.13***
Task orientation	.71	.09	.37***		.57	.10	.30***	
Ego orientation	.02	.06	.02		.16	.07	.12	
Step 2				.10***				.08***
Mastery climate	.60	.09	.31***		.51	.09	.26***	
Performance climate	−.10	.06	−.07		−.19	.06	−.15***	
Enjoyment/interest								
Step 1				.09***				.10***
Task orientation	.53	.09	.30***		.50	.08	.32***	
Ego orientation	.01	.06	.01		−.02	.06	−.01	
Step 2				.16***				.05***
Mastery climate	.75	.09	.41***		.33	.08	.21***	
Performance climate	−.07	.06	−.06		−.11	.05	−.11	

Note. Interaction effects are displayed when the effect was significant in at least one context.

*$p < .05$; **$p \leq .01$; ***$p \leq .001$.

Table 3.4. Continues

Goal Orientations and Perceived Climates predicting Motivational Outcomes (N = 410)

	Training				Competition			
Outcome	*B*	*SE*	β	$R^{2\text{Unique}}$	*B*	*SE*	β	$R^{2\ \text{Unique}}$
Tension								
Step 1				.04***				.00
Task orientation	−.31	.11	−.14**		.05	.12	.02	
Ego orientation	−.18	.08	−.12		.01	.09	.01	
Step 2				.07***				.01
Mastery climate	.03	.12	.01		.08	.12	.04	
Performance climate (PC)	.44	.08	.29***		.16	.07	.11	
Step 3				.03*				.00
Ego orientation x PC	−.33	.09	−.18***		−.05	.10	−.03	

Note. Interaction effects are displayed when the effect was significant in at least one context.

*$p < .05$; **$p \leq .01$; ***$p \leq .001$.

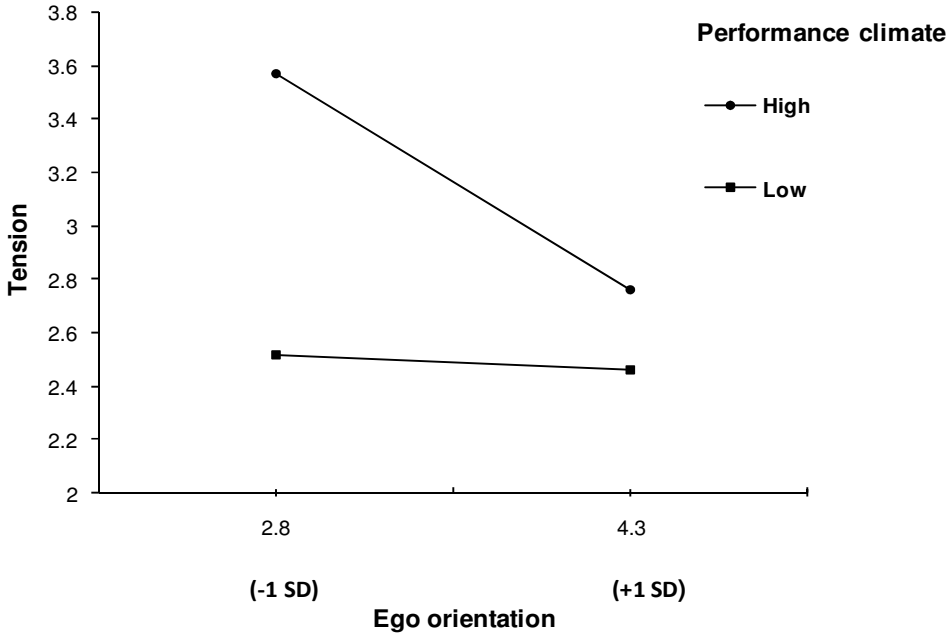

Figure 3.2. Simple regression lines for tension in training on ego orientation at high and low values of performance climate.

Discussion

Although training and competition are integral contexts of sport, to date, this distinction has been largely overlooked in achievement goal research. It has been suggested that different achievement criteria may operate within these contexts (Harwood, 2000) and empirical evidence in tennis and softball has provided support for this contention (e.g., van de Pol & Kavussanu, 2011; Williams, 1998). In this study, we sought to replicate and extend this work to football and examine differences in motivational climate along achievement goals in two contexts.

Differences and Consistency across Contexts

The first study purpose was to examine differences in football players' goal orientations and perceptions of the motivational climate across training and competition. In support of our hypothesis and previous research in tennis players (van de Pol & Kavussanu, 2011), ego orientation was higher in competition than in training at both the overall and the within-person levels; thus, football players tend to use more normative criteria to evaluate their success in competition than in training. Contrary to our hypothesis and previous research that found higher task orientation in training than in competition (Tammen, 1998; van de Pol & Kavussanu, 2011), this goal did not differ between the two contexts at the overall level. This discrepancy may be due to the type of sport. In team sports, players work toward a common goal and share the rewards (or punishments) depending on the group outcome and in contrast to individual sports, cooperation is vital during competition. As the belief that cooperation is fundamental to sport success has been linked to task orientation (e.g., Duda & Nicholls, 1992) this may explain why football players' task orientation did not decrease from training to competition.

Our findings highlight the value of examining contextual differences at the overall and the within-person levels. Although athletes' goal orientations showed at the within-person level no strong contextual variation (i.e., the high *percentage* of athletes who did not change their goals; see Table 3.3), this analysis made it possible to detect the direction of contextual change in the two goals at the within-person level. That ego orientation differed also at the overall level indicates that only this goal changed significantly towards one and the same direction: an increase from training to competition. This may be explained by the strength of the normative cues in the competition context (e.g., emphasis on social comparison). Ego-oriented players may be particularly sensitive to these cues which may strengthen their tendency to evaluate success using normative criteria in this context compared to training.

With regard to the perceived motivational climate, perceptions of performance climate were higher in competition than in training. Although perceived performance climate showed at the within-person level no strong contextual variation (i.e., the high percentage of athletes who did not change their perceptions of a performance climate; see Table 3.3), it supported the direction of change found on an overall level. Together these analyses suggest that coaches may place more emphasis on normative success in competition than in training. Perceptions of mastery climate were similar across the two contexts suggesting that coaches may reward behaviours such as trying hard and improving skills similarly in both contexts. Overall, our findings provide support for Ames' (1992a) argument that sport contexts can be structured as a mastery climate even under interpersonal competitive conditions.

The second purpose was to examine consistency in goals and climate between the two contexts. Correlations between training and competition for both goal orientations and motivational climate were large indicating high cross-context consistency in these variables. Previous research has also found this consistency in goal orientations between training and competition (van de Pol & Kavussanu, 2011) as well as between the sport and school domains (e.g., Duda & Nicholls, 1992) but this is the first study to report similar findings for motivational climate. Importantly, these correlations were not too high indicating that goal orientations and perceived motivational climate may be specific to the contexts of training and competition. Our findings suggest that these constructs may be sufficiently independent to merit separate examination with reference to the specific context of training and competition.

Goals and Climates and Motivational Outcomes

The third study purpose was to examine whether the context moderates the relationships between goal orientations and motivational climate and effort, enjoyment and tension. Task orientation positively predicted effort and enjoyment in both contexts,

supporting our hypotheses and previous sport research (Biddle et al., 2003; Ntoumanis & Biddle, 1999), whereas ego orientation did not predict these variables in either context. The latter finding is not consistent with the result of previous research in which tennis players' ego orientation positively predicted effort in competition when task orientation was low or average (van de Pol & Kavussanu, 2011). The discrepancy may be due to the type of sport. In individual sports, high ego-oriented athletes may link the effort they apply during a match directly to a gain in normative success (i.e., outperforming an opponent in a head-to-head confrontation results in a direct win), and may therefore exert more effort to attain this success than team-sport athletes, who can outperform members of the opposing team during a match but still lose the match as a team. Thus, ego orientation may lead to effort in competition in individual but not team sport athletes.

Perceived mastery climate positively predicted effort and enjoyment in both contexts, in line with previous research (e.g., Ntoumanis & Biddle, 1999), and was a stronger predictor of enjoyment in training than in competition. This stronger link could be due to features of a mastery climate such as encouraging players to improve which match the purpose of training. Perceived performance climate negatively predicted effort in competition. It has been suggested that the presence of performance cues may not inhibit achievement behaviours when mastery cues are salient (Ames & Archer, 1988). However, our findings show that performance climate negatively predicted effort in competition even when mastery cues were prominent, which suggests that when coaches want to enhance athletes' effort in competition they may not solely rely on the benefits of a (created) mastery climate but also need to pay particular attention to temper a performance climate in this context.

Task orientation predicted tension negatively in training, which suggests that a focus on self-referenced achievement standards may protect athletes against feeling pressure (Ommundsen & Pedersen, 1999). Ego orientation also predicted tension negatively in

training but only when perceived performance climate was high. This may be because the normative goals pursued by ego-oriented athletes are compatible with the evaluation criteria (i.e., success based on normative comparison) emphasized in a performance climate (Ames, 1992b); thus, they may be better able to cope with pressure in a performance climate. Goal orientations did not predict tension in competition. In a study by Hall, Kerr and Matthews (1998), anxiety prior to competition was positively predicted by athletes' ego goal that referred to feelings of success in the upcoming competition, but *not* by their general sport goal orientations. Taken together with these results, our findings suggest that, although ego orientation may lead to anxiety prior (or during) a specific competition, this relationship might be more difficult to detect on a general level.

Perceived performance climate predicted tension positively in training, which is consistent with previous sport research (Seifriz, Duda, & Chi, 1992). Performance climate did not predict tension in competition. It has been suggested that people use more adaptive strategies to cope with stressful emotions in an environment that consistently requires the use of such strategies (Lazarus & Folkman, 1984). Compared to training, in competition athletes may be more able to cope with tension that is derived from normative success striving and public evaluation, as these factors are inherent in this context. Perceived mastery climate was unrelated to tension in both contexts, supporting previous research (Seifriz et al., 1992; Newton & Duda, 1999). Thus, when coaches aim to reduce athletes' tension they should focus on *avoiding* those behaviours that create a performance climate, such as encouraging social comparison and intra-team rivalry.

Our findings suggest that in order to achieve positive motivational consequences in training and competition, coaches need to promote athletes' task orientation and create a mastery motivational climate in both contexts. However, because ego orientation and performance climate may increase from training to competition, coaches need to reward

athletes' effort and personal progress in training *and* competition. Moreover, coaches need to temper normative comparison in both contexts, paying particular attention to the competition context where normative achievement cues are salient.

Directions for Future Research

There are several avenues for future research emanating from the present study. First, researchers could examine whether competition level and sport type influence the relationship between achievement goals and motivational outcomes in training and competition. Second, they could investigate approach/avoidance goals, which incorporate the *valence* (i.e., approach versus avoidance) dimension of competence (e.g., Elliot & McGregor, 2001). We focused on task and ego goals which reflect differences in the *definition* dimension of competence (i.e., whether one uses self versus other-referenced criteria to evaluate success) because the main difference between training and competition is the explicit focus on other-referenced competence evaluation in the competition context; this focus may not be as prominent in training. Thus, the distinction between training and competition is more likely to influence the definition dimension of competence. However, future research could extend the current work by examining approach-avoidance goals in the training and competition contexts. Third, football players were nested within teams: Therefore, team members who play for the same coach are not statistically independent with respect to their achievement goals and perceptions of the motivational climate (cf. Smith, Smoll, & Cumming, 2007). Hence, as individual team members may share intra-team variance, this may have inflated the Type one error rate. Therefore, future research may extend the current findings by controlling for this potential variability in goals and climate perceptions via 'multilevel linear modelling' (MLM), which is an appropriate procedure when data is organised at more than one level (e.g., athletes are nested in teams) and permits prediction of individual scores adjusted for

team differences and vice versa (Tabachnick & Fidell, 2007). Finally, future research could examine the current relationships before a competitive game and training session.

Conclusion

Our findings suggest that training and competition contexts may influence football players' tendency to be task or ego involved, and the perceived motivational climate created by the coach. In both contexts, coaches should promote task orientation, create a mastery climate, and avoid creating a performance climate. Finally, some of the relationships between goal orientations, perceptions of the motivational climate, and motivational outcomes were different depending on the context. Our findings suggest that the distinction between training and competition is a worthwhile one.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Ames, C. (1992a). Achievement goals, motivational climate, and motivational processes. In G. C. Roberts (Ed.), *Motivation in Sport and Exercise* (pp. 161-177). Champaign, IL: Human Kinetics.

Ames, C. (1992b). Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261-271.

Ames, C., & Ames, R. (1984). Goal structures and motivation. *The Elementary School Journal, 85,* 39-52.

Ames, C., & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80,* 260–267.

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3(5),* 1-20. doi:10.1080/17461390300073504

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). London: Lawrence Erlbaum Associates.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*, 297-334.

Duda, J.L., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290–299.

Dweck, C. S., & Leggett, E. L. (1988). A social-cognitive approach to motivation and personality. *Psychological Review, 95,* 256-273.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501-519. doi: 10.1037//0022-3514.80.3.501

Fryer, J. W., & Elliott, A. J. (2007). Stability and change in achievement goals. *Journal of Educational Psychology, 99*, 700-714. doi:10.1037/0022-0663.99.4.700

Hall, H. K., Kerr, A. W., & Matthews, J. (1998). Precompetitive anxiety in sport: The contribution of achievement goals and perfectionism. *Journal of Sport & Exercise Psychology, 20,* 194–217.

Harwood, C. G. (2002). Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *Journal of Applied Sport Psychology, 14*, 106-119. doi: 10.1080/10413200252907770

Harwood, C. G., & Hardy, L. (2001). Persistence and effort in moving achievement goal research forward: A response to Treasure and colleagues. *Journal of Sport & Exercise Psychology, 23,* 330-345.

Harwood, C., Spray, C. M., & Keegan, R. (2008). Achievement goal theories in sport. In T. S. Horn (Ed.), *Advances in sport psychology* (3rd ed., pp. 157-186). Champaign, IL: Human Kinetics.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59*, 12-19.

Kavussanu, M., & Spray, C. M. (2006). Contextual influences on moral functioning of male football players. *The Sport Psychologist, 20,* 1-23.

Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal and coping*. New York: Springer.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60,* 48-58.

Newton, M., & Duda, J.L. (1999). The interaction of motivational climate, dispositional goal orientations, and perceived ability in predicting indices of motivation. *International Journal of Sport Psychology, 30*, 63-82.

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. doi:10.1080/026404100365018

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328–346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Ntoumanis, N., & Biddle, S. (1999). A review of motivational climate in physical activity. *Journal of Sports Sciences, 17,* 643-665. doi:10.1080/026404199365678

Ommundsen, Y., & Pedersen, B. H. (1999). The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety. *Scandinavian Journal of Medicine and Science in Sports, 9,* 333-343.

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. *Criminology, 36*, 859-866.

Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology*, *25*, 92-104.

Roberts, G. C., Treasure, D. C., & Balague, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16,* 337-347. doi:10.1080/02640419808559362

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43,* 450-461.

Seifriz, J., Duda, J. L., & Chi, L. (1992). The relationship of perceived motivational climate to intrinsic motivation and beliefs about success in basketball. *Journal of Sport & Exercise Psychology, 14,* 375-391.

Smith, R.E., Smoll., F.L., & Cumming, S.P. (2007). Effects of a motivational climate intervention for coaches on young athletes' sport performance anxiety. *Journal of Sport & Exercise Psychology, 29*, 39-59.

Standage, M., Duda, J. L., & Ntoumanis, N. (2003). Predicting motivational regulations in physical education: The interplay between dispositional goal orientations, motivational climate, and perceived competence. *Journal of Sports Sciences, 21*, 631-647. doi:10.1080/0264041031000101962

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

Tammen, V.V. (1998). Changes in task and ego orientations in relation to training in competitive situations. *Journal of Sport & Exercise Psychology, 20* (Suppl.), S120.

Treasure, D. C., & Roberts, G. C. (1994). Cognitive and affective concomitants of task and ego goal orientations during the middle school years. *Journal of Sport & Exercise Psychology, 16,* 15-28.

van de Pol, P. K. C., & Kavussanu, M. (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise, 12*, 176–183. doi: 10.1016/j.psychsport.2010.09.005

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47-57.

CHAPTER FOUR

Study three: Achievement Motivation across Training and Competition in Individual and Team Sports

Abstract

This study had two main purposes: The first purpose was to examine consistency and differences in goal orientations across training and competition contexts. The second purpose was to investigate whether goal orientations predict effort, enjoyment, and trait anxiety differently in the two contexts. In addition, for both study purposes we explored whether type of sport (i.e., individual versus team sports) moderates these effects. Participants were individual (n = 145) and team-sport (n = 203) athletes, who completed questionnaires measuring goal orientations, effort, enjoyment, and trait anxiety in training and competition. Both task and ego orientation showed medium-to-large consistency across the two contexts for individual and team-sport athletes. Athletes in both sport types reported higher ego orientation in competition than in training, but similar levels of task orientation. Task orientation predicted effort positively in training. However in competition this goal predicted effort positively only in individual-sport athletes who had low ego orientation. Task orientation also predicted enjoyment positively in both contexts; however, in competition this prediction was significantly stronger in individual than in team-sport athletes. Ego orientation also predicted enjoyment positively in competition in both individual and team-sport athletes. Finally, task orientation predicted trait anxiety negatively in competition but only in individual-sport athletes. The findings highlight the importance of distinguishing between the training and competition contexts when examining motivational processes in sport, and acknowledging that sport type may moderate these processes.

Introduction

According to achievement goal theory (e.g., Nicholls, 1989) individuals' central motive for participating in achievement contexts is to develop or demonstrate competence (Nicholls, 1989). However, people can use different criteria to evaluate competence, which form the basis for two distinct achievement goals, namely *task* and *ego involvement* (Nicholls, 1989). When individuals are task involved, they evaluate competence using self-referenced criteria and feel successful when they learn, master a skill or improve on a task. In contrast, when individuals are ego involved, they evaluate competence using other-referenced criteria and feel successful when they establish normative superiority (Nicholls, 1989). People have a proneness to the two types of involvement which are known as *task* and *ego goal orientations* (Nicholls, 1989).

Contexts and Goal orientations

To date, the vast majority of sport research stemming from achievement goal theory has been conducted in the general domain of sport. However, this domain can be subdivided into *training* and *competition* contexts, which entail characteristics that could differently promote task or ego involvement. For example, organised training is typically structured to provide opportunities for athletes to develop and practise their skills. Such emphasis on self-referenced competence attainment should promote task involvement (Nicholls, 1989). Although social comparison may occur in training, it is *inherent* in organised competition because objective success in this context is evaluated by normative criteria. These other-referenced evaluative conditions in competition should promote ego involvement (Nicholls, 1989). Hence, these distinct contextual characteristics may lead athletes to evaluate their achievement success differently within training and competition, and endorse goal orientations that are specific to each context. These goal orientations represent the proneness to be task or ego involved in these two contexts (cf. Nicholls, 1989).

One way contextual influences on achievement goals have been investigated is by examining their *consistency* between contexts (e.g., Duda & Nicholls, 1992; Fryer & Elliot, 2007), that is the extent to which goal orientations in one context are associated with their respective variables in another context. However, in sport research, this issue has received little attention so far. This issue is important because the strength of the relationship would indicate whether goals in different contexts are sufficiently distinct to merit separate examination. To date, only two studies have investigated goal orientations' consistency across training and competition. The first study found a strong – but not too high – positive relationship between training and competition goals, $r = .62$ for task and $r = .66$ for ego orientation, in tennis players (van de Pol & Kavussanu, 2011). These results were replicated in a sample of football players, $r = .56$ for task and $r = .59$ for ego orientation (van de Pol, Kavussanu, & Ring, 2011).

A second way contextual influences on achievement goals have been examined is by investigating *differences* between contexts, that is, the degree to which goals vary between contexts on a mean level within a sample. Very few studies have examined whether achievement goals differ across training and competition contexts. These studies have found that task orientation of tennis players and task involvement of female softball players were higher in training than in competition (van de Pol & Kavussanu, 2011; Williams, 1998) and that ego orientation was higher in competition than in training in tennis and football players (van de Pol & Kavussanu, 2011; van de Pol et al., 2011).

A limitation of these studies is that they examined athletes from only one sport, and therefore, their findings can be generalised only to that sport. These findings also indicate that athletes' goal orientations across training and competition may be moderated by *type of sport*, classified as *individual* and *team sports*. Previous research has examined the moderating role of sport type on goal orientations. For example, two studies found that

individual-sport athletes had higher ego orientation than team-sport athletes, while no difference was found for athletes' task orientation between the two sport types (Hanrahan & Cerin, 2009; Harwood, 2002). However, in another study, individual-sport athletes reported higher task orientation than team-sport athletes, while no difference was found for ego orientation (Hanrahan & Biddle, 2002). These findings indicate that sport type may affect athletes' goal orientations, but also some inconsistency in the patterns of change. Moreover, it is unclear if and how sport type affects a potential variation in achievement goals across training and competition. For instance, individual-sport athletes may be more *personally* identifiable and publicly evaluated in competition than team-sport athletes (cf. Hanrahan & Cerin, 2009; Harwood, 2002); accordingly, this may lead to a stronger increase in ego orientation and decrease in task orientation from training to competition in individual-sport athletes compared to team-sport athletes. To date, it is unclear how sport type moderates achievement goals across training and competition, indicating that research is needed to examine this issue.

Contexts, Goal Orientations and Motivational Outcomes

In sport research, goal orientations have been associated with important motivational outcomes such as *effort*, *enjoyment/interest*, and *trait anxiety*. Specifically, task orientation has been linked positively with effort and enjoyment and negatively with trait anxiety. In contrast, ego orientation has been typically unrelated to effort and enjoyment, and positively related to trait anxiety across a number of studies (for reviews see Biddle, Wang, Kavussanu, & Spray, 2003; Harwood, Spray, & Keegan, 2008; Smith, Smoll, Cumming, & Grossbard, 2006).

Recent empirical findings indicate that the distinction between training and competition may influence the relationships between goal orientations and these motivational outcomes. Although in two studies task orientation positively predicted effort in both contexts in tennis

and football players, ego orientation positively predicted effort only in competition in tennis – but not football – players and only when their task orientation was low or average (van de Pol & Kavussanu, 2011; van de Pol et al., 2011). In both studies, ego orientation was unrelated to enjoyment. These findings suggest that, although the relationship between task orientation and effort and enjoyment is stable across the two contexts, the relationships between ego orientation and these outcomes may vary between contexts.

The relationship between goal orientations and trait anxiety may also vary between training and competition. In past research in the sport domain, trait anxiety has been negatively related to task orientation and positively related to ego orientation (Smith et al., 2006; White & Zellner, 1996). However, a recent study in football players (van de Pol et al., 2011) found that task orientation negatively predicted tension, which is an expression of trait anxiety (Martens, 1977), in training, but not in competition. Ego orientation also did not predict tension in competition and was unrelated to tension in training, with the exception of players who perceived a high performance climate in their team; in this case, ego orientation negatively predicted tension (van de Pol et al., 2011). These findings suggest that the contextual distinction between training and competition may have implications for the relationship between goal orientations and sport trait anxiety.

Sport type may affect the relationships between goal orientations and these motivational outcomes across training and competition. For example, a distinct feature between the two sport types may be that individual sports provide more exact individual performance information compared to team sports (cf. Hanrahan & Cerin, 2009). Accordingly, task-oriented athletes may find it easier to link their self-referenced goal striving to a concrete personal success in individual sports compared to team sports where personal success is entangled with the overall-team success. Hence, task oriented athletes in individual sports may perceive a stronger sense of personal accomplishment and control, which may lead them

to put more effort, experience more enjoyment and less anxiety in their achievement striving, compared to team sport athletes (cf. Folkman, 1984; Nicholls, 1989). Moreover, this discrepancy may be more salient in competition than in training due to the strong emphasis on objective performance standards in competition. For instance, athletes in individual sports have their 'personal bests' as an objective indicator of individual performance improvement in competition, whereas for team-sport athletes such objective *personal* performance information is generally less available. To date, no research exists which examined the moderating role of sport type on the relationships between goal orientations and motivational outcomes across training and competition, an issue which needs to be addressed.

The Present Study

The literature reviewed above suggests that there is a need to examine athletes' motivational processes across training and competition contexts. The present study was designed to address this need and had two purposes. The first purpose was to examine consistency and differences in task and ego orientations[I] across training and competition contexts. We expected to find strong – but not too high – positive associations between training and competition goals, and higher ego orientation in competition than in training. We made no predictions for context differences in task orientation due to the inconsistent findings reported in previous research regarding this goal (van de Pol & Kavussanu, 2011; van de Pol et al., 2011; Williams, 1998).

The second study purpose was to investigate whether goal orientations differently predict effort, enjoyment/interest and trait anxiety across training and competition. We hypothesized that task orientation would positively predict effort and enjoyment, and

[I] We focused on task and ego goals, which reflect differences in the *definition* (i.e., self versus other-referenced) dimension of competence. However, we acknowledge that researchers (e.g., Elliot & McGregor, 2001) have advocated considering the *valence* (i.e., approach versus avoidance) dimension of competence resulting in a 2 x 2 model. We focused on task and ego goals because the main difference between training and competition is the *explicit* focus on other-referenced competence evaluation in competition.

negatively predict trait anxiety in both contexts (e.g., van de Pol & Kavussanu, 2011; van de Pol et al., 2011). However, we expected that ego orientation would be unrelated to effort and trait anxiety in training and positively predict effort in competition (e.g., van de Pol & Kavussanu, 2011; van de Pol et al., 2011). Further, we expected that ego orientation would be unrelated to enjoyment in both contexts (Biddle et al., 2003; van de Pol & Kavussanu, 2011; van de Pol et al., 2011). Finally, we made no predictions for the relationship between ego orientation and trait anxiety in competition due to inconsistent findings reported in previous research (e.g., Smith et al., 2006; van de Pol et al., 2011).

We also explored whether the findings regarding the above two study purposes were consistent across individual and team sports. This was deemed important because previous studies examining achievement goals in different sport contexts in individual and team sports have shown some inconsistent results (van de Pol & Kavussanu, 2011; van de Pol et al., 2011; Williams, 1998). To date no research has examined this issue by a parallel investigation of both sport types which is required to statistically verify its potential influence. However, we formed no specific hypotheses for this objective due to insufficient empirical evidence on which hypotheses could be based.

Method

Participants

Participants were 214 male and 134 female athletes, recruited from teams at a British university. They were recruited from a variety of sports with 145 participating in individual (i.e., athletics, badminton, golf, table tennis, and squash) and 203 participating in team sports (i.e., American football, basketball, frisbee, netball, rugby, football, volleyball, and water polo). Type of sport was determined using the dependency classification system proposed by Chelladurai and Saleh (1978), which is based on the degree to which success depends on the level of reliance on group members: Sports with a high degree of independence were

classified as individual sports, whereas those with a high level of interdependence were classified as team sports. Participants' mean age was 19.78 (*SD* = 1.60) years and they competed in their sport for an average of 5.47 (*SD* = 3.49) years. All participants competed in the British Universities & Colleges Sport competition. Their competition level varied from "premier league", which was the highest to "midlands 1 to 4 league", with midlands 4 being the lowest level. At the time of data collection, the number of sessions they had trained with their coach in that season varied from 1 to 5 (8 %), 5-10 (16 %), 10-15 (35 %), to 15-20 (41 %); their mean number of attended training sessions per week was 2.16 (*SD* = 0.75); and the average number of competitions in which they participated varied from 1-5 (47 %), 5-10 (38 %), 10-15 (11 %), to 15-20 (4 %).

Measures

We used a questionnaire which was divided into two major sections, one referring to training and the other to competition. The athletes were oriented toward the two contexts through written instructions (e.g., "Please think about your sport experience in *training*, and respond honestly to the following statements…"). A similar procedure has been used in previous research that examined goal orientations across school and sport (Duda & Nicholls, 1992) and training and competition (van de Pol & Kavussanu, 2011). To control for order effects, the training and competition sections were counter-balanced.

Goal orientations. Athletes' goal orientations in the two contexts were measured with the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which consists of two six-item subscales measuring task and ego goal orientations. Participants were asked when they feel most successful in each context. The stem for each item was "In training/competition, I feel most successful when…". Example items were: "I work hard" for task orientation and "I outperform others" for ego orientation. Participants responded on a Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The POSQ has

demonstrated very good internal consistency with Cronbach's alpha coefficients of .90 for the task and .84 for the ego orientation subscale (Roberts et al., 1998). The mean for each subscale was computed and used in all analyses. This procedure was followed for all variables.

Effort and enjoyment/interest. Two subscales of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) were used to measure effort (5 items), and enjoyment/interest (5 items) in the two contexts. Participants were asked to think about their experiences during training/competition, and to respond to the IMI items. Example items used were: "I put a lot of effort into training/competition", and "I enjoy training/competition very much". Each item was rated on a Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). These subscales have demonstrated good reliability in previous research (effort, $\alpha = .84$; enjoyment, $\alpha = .78$, McAuley, Duncan, & Tammen, 1989).

Trait anxiety. Athletes' sport trait anxiety in the two contexts was measured with a modified "Sport Anxiety Scale-2" (SAS-2; Smith et al., 2006). The SAS-2 consists of three 5-item subscales: cognitive trait anxiety (i.e., anticipatory anxiety /worrying), somatic trait anxiety (i.e., anxious arousal during a task) and concentration disruption. In line with previous studies (e.g., Neil, Mellalieu, & Hanton, 2006), we used only the cognitive and somatic trait anxiety scales. Participants were asked to indicate how they usually feel during training/competition, and example items were: "I worry that I will not perform well" for cognitive anxiety and "my body feels tense" for somatic anxiety. The items were rated on a Likert scale anchored by 1 (*not at all*) to 5 (*extremely*). These subscales have demonstrated very good internal consistency with alpha coefficients of .89 for the cognitive and .84 for the somatic anxiety subscale (Smith et al., 2006). We used the average score of the two subscales because our interest was in trait anxiety in general and the two subscales were substantially correlated within each context (i.e., training, $r = .59$, competition, $r = .43$).

Procedure

Upon approval of the study by the University Ethics Committee, we contacted the coaches of university sport teams via letter or e-mail to request their help with the study. The general study purpose and procedure for data collection were explained to the coaches during a subsequent phone call. Fifteen coaches agreed to help with the study. Questionnaires were administered to the players by one of two undergraduate research assistants at the beginning or end of a training session. The data collection took place around ten weeks after the season had started. Athletes were informed of the study purposes verbally by the research assistant and by the information sheet attached to each questionnaire. It was emphasized that participation in the study was voluntary and that responses would be kept confidential. The athletes were asked to think about how they *usually* experience training and competition when they completed the respective parts of the questionnaire. Before completing the questionnaire they signed a consent form.

Results

Preliminary Analysis

Preliminary analysis revealed that only 0.03 % of the values were randomly missing across the data. When less than 5 % of the data are randomly missing from a large data set, almost any procedure for replacing missing values yields similar results (Tabachnick & Fidell, 2007). The missing values were replaced with the series mean. Outliers were examined using standardised *z*-scores. Cases with scores greater than 3.29 *SD* from the mean were considered outliers (Tabachnick & Fidell, 2007). In the complete data set, 15 outliers were found and removed. All scales showed very good internal consistency with alpha coefficients ranging from .80 to .90.

Descriptive Statistics

Participants reported high task orientation in training (M = 4.20, SD = 0.55) and competition (M = 4.18, SD = 0.54), moderately high ego orientation in training (M = 3.63, SD = 0.68), and high ego orientation in competition (M = 4.04, SD = 0.61). They also reported in both contexts: high levels of effort (training: M = 5.59, SD = 0.85; competition: M = 6.12, SD = 0.95) and enjoyment/interest (training: M = 5.22, SD = 0.96; competition: M = 5.90, SD = 0.86), and low-to-moderate trait anxiety (training: M = 2.03, SD = 0.70; competition: M = 2.57, SD = 0.68). Correlations between all variables are presented in Table 4.1; values of .10, .30, and .50 are considered small, medium, and large effect sizes, respectively (Cohen, 1992).

Table 4.1

Zero Order Correlations among Variables in Training and Competition (N=348)

	1	2	3	4	5	6	7
1. Task orientation		.42**	.19**	.37**	−.04	.08	.10
2. Ego orientation	.17**		.20**	.36**	−.01	−.17**	.12*
3. Effort	.37**	.11*		.37**	−.14*	−.07	.20**
4. Enjoyment/interest	.28**	.10	.44**		−.17**	−.13*	.23**
5. Trait anxiety	.04	.06	.06	.02		.15**	−.01
6. Gender	−.11*	−.27**	.02	−.12*	−.01		.13*
7. Type of Sport	.01	.08	.13*	.01	−.02	.13*	

Notes: Correlations among variables are presented below the diagonal for training and above the diagonal for competition; gender and type of sport were coded as '0' for males and individual sports and '1' for females and team sports. *p < .05; ** p < .01.

Cross-Context Consistency and Differences in Goal Orientations

The first study purpose was to investigate *consistency* and *differences* in goal orientations across training and competition contexts. To examine cross-contextual consistency, we computed zero-order correlations between training and competition goal orientations. We found positive medium-to-large correlations for task, $r = .42$, $p < .001$, and ego orientation, $r = .39$, $p < .001$. We also explored whether these relationships were moderated by sport type: First, we calculated the cross-context *partial* correlations for each goal orientation controlling for sport type, and then, using Fisher's *r*-to-*z* transformation, we statistically compared these partial correlations with the zero-order correlations reported above. This analysis showed that the partial correlations ($r^{\text{partial}} = .42$ for task orientation and $r^{\text{partial}} = .38$ for ego orientation) were very similar to zero-order correlations, and the two sets of correlations did not significantly differ from each other ($z = 0.02$, $p = 0.99$ for task orientation and $z = -0.08$, $p = 0.94$ for ego orientation).

To examine differences in goal orientations between the two contexts, and explore whether these are moderated by sport type, we conducted a 2 Context (training, competition) x 2 Sport Type (individual, team) repeated measures ANCOVA, controlling for gender, because this variable was significantly associated with the two goal orientations (see Table 4.1). Partial eta-squared (η^2_p) was used as a measure of effect size, and values of .02, .13 and .26 indicate small, medium and large effect sizes, respectively (Cohen, 1992). Pairwise comparisons were conducted with the Bonferroni correction applied to multiple comparisons. This procedure revealed significant univariate effects for: context, $F(1, 345) = 112.68$, $p < .001$, $\eta^2_p = .25$, and type of sport, $F(1, 345) = 8.57$, $p < .01$, $\eta^2_p = .02$, on ego orientation, indicating that this goal was significantly higher in competition ($M = 4.03$, $SE = .03$) than in training ($M = 3.62$, $SE = .04$; $M_{\text{difference}} = 0.41$, $SE = .04$, $p < .001$), and higher in team ($M = 3.91$, $SE = .04$) than in individual-sport ($M = 3.74$, $SE = .04$) athletes ($M_{\text{difference}} = 0.17$, SE

= .06, $p < .01$). Task orientation did not significantly differ between the two contexts or between individual and team sports and there was no interaction effect between context and sport type.

Cross-Context Relationships between Goals and Outcomes

The second study purpose was to examine whether goal orientations predict effort, enjoyment, and trait anxiety differently across training and competition. We also explored whether sport type moderates these relationships. To address this purpose, first we conducted hierarchical regression analyses to examine the main and interactive effects of goals and sport type on outcomes within each context. Next, we tested whether identified relationships were significantly different between the two contexts by comparing the respective unstandardized regression coefficients with a *z*-test (e.g., Paternoster, Brame, Mazerolle, & Piquero, 1998).

Before entering the variables in the regression model, task and ego orientations were centered to avoid non-essential multi-collinearity in interaction terms, 'gender' and 'type of sport' were dummy-coded, and interaction terms were formed by multiplying the centered predictors (see Aiken & West, 1991). Then, we entered: gender in the first step to control for its effects (see Table 4.1); type of sport and goal orientations in the second step to examine main effects; and all possible 2 and 3-way interactions between type of sport and goals in the third and fourth steps, respectively, to investigate interaction effects between the two goals and whether sport type moderates the relationship between goal orientations and outcome in each context. To protect against Type I error without increasing the risk of Type II error, we examined individual regression coefficients only when the *F*-test for the overall model for each step was significant (Cohen, Cohen, West, & Aiken, 2003). We used the squared semi-partial correlations (sr^2) as an effect size of the unique contribution of each predictor to the total variance (R^2) of each outcome because predictor variables were significantly correlated

(see Table 4.1). Values of .01, .09, and .25 for sr^2 indicate small, medium, and large effect sizes, respectively (Cohen et al., 2003).

To permit a more powerful test of the significant interaction effects in each model, a sequential step-down approach was used: Starting with the highest-order term in the regression equation, the non-significant interactions were removed one at a time and each subsequent term was tested for significance (Aiken & West, 1991). Identified interaction effects were explored further by: a) plotting two simple regression lines corresponding to the regression of the outcome variable on the predictor at low (1 *SD* below the mean) and high (1 *SD* above the mean) values of the moderator; b) testing whether the slopes of the simple regression lines were significantly different from zero; and c) testing differences between regression lines at a specific point of the predictor variable (Aiken & West, 1991). Results of the regression analyses are presented in Table 4.2.

Effort. In training, effort was positively predicted only by task orientation and type of sport; team-sport athletes reported more effort in this context than individual-sport athletes. The overall model for this step was significant, $F(4, 343) = 16.42$, $p < .001$, accounting for a medium-to-large ($\Delta R^2 = .16$, see Cohen, 1992) amount of variance. The total variance explained, including four sequential regression steps (see Table 4.2), was medium-to-large ($R^2 = .19$). In competition, ego orientation (X) interacted with task orientation (Z) and sport type (W) in predicting effort. Although we also found main effects for task orientation and sport type, and a 2-way interaction between ego and task orientation, we have interpreted only the 3-way interaction ($\hat{Y} = -.09X + .32Z + .18W - .82XZ + .33XW - .24ZW + .73XZW + 6.16$) as recommended by Aiken and West (1991). The overall model for this step was significant, $F(8, 339) = 6.97$, $p < .001$, and accounted for a small ($\Delta R^2 = .02$) amount of unique variance. Although this effect is 'small' it may be important as interactions in general, and in particular higher-order ones, often account for only a small amount of variance over and above first-

order effects, in particular when the preceding first-order effects used up a substantial amount of variance in the outcome variable (Aiken & West, 1991; Cohen et al., 2003). The total variance explained after step four was medium ($R^2 = .14$).

Probing this interaction effect showed that in individual sports (see Figure 4.1a), when task orientation was high, higher ego orientation was associated with a decrease in effort [$b = -0.54$, $SE = 0.20$, $t\ (339) = -2.74$, $p < .01$]. In contrast, when task orientation was low, an increase in ego orientation was associated with more effort [$b = 0.35$, $SE = 0.15$, $t\ (339) = 2.32$, $p < .05$]. In team-sport athletes (see Figure 4.1b); task orientation did not predict effort at either level of ego orientation. The regression coefficients for this interaction effect were significantly different between the two contexts ($z = 2.57$, $p = .01$).

Enjoyment. Regression analysis revealed several significant results regarding enjoyment. In training, task orientation was the only variable to predict enjoyment with individuals high in task orientation reporting greater enjoyment in this context. The overall model for this step was significant, $F(4, 343) = 8.24$, $p < .001$, and accounted for a small-to-medium ($\Delta R^2 = .07$) amount of variance. There were no interaction effects in this context. The total variance explained including three sequential steps (see Table 4.2) was small-to-medium ($R^2 = .09$). In competition, both main and interaction effects were revealed. Individuals high in ego orientation were more likely to report high enjoyment in this context. Also, task orientation (X) interacted with type of sport (Z) in predicting enjoyment ($\hat{Y} = .65X + .35Z - .38XZ + 5.80$). The overall model for step 2 (main effects of goals and sport type) was significant, $F(4, 343) = 26.75$, $p < .001$, and accounted for a medium-to-large ($\Delta R^2 = .22$) amount of unique variance. The overall model for the interaction effect was also significant, $F(5, 342) = 22.98$, $p < .001$, accounting for a small ($\Delta R^2 = .01$) amount of unique variance.

Probing this interaction (see Figure 4.2) showed that higher task orientation was associated with greater enjoyment in individual [$b = .65$, $SE = .12$, $p < .001$, $t\ (342) = 5.48$]

and team sports [b = .27, SE = .11, t (342) = 2.32, p < .05]. However, the simple slopes did not cross within the possible range of the task orientation scale. This indicates that the overall level of enjoyment remains higher for team than for individual-sport athletes. The difference in the regression coefficients for this interaction effect between training and competition contexts approached significance (z = 1.92, p = .055). The total amount of variance explained after step three was large (R^2 = .25).

Trait anxiety. No main effects were found for goal orientations or sport type on trait anxiety in either context (see Table 4.2). However, in competition, task orientation (X) interacted with sport type (Z) in predicting anxiety ($\hat{Y}$ = −.28X − .04Z + .36XZ + 2.50). The overall model for this step was significant, F(5, 342) = 3.30, p < .001, and accounted for a small (ΔR^2 = .02) amount of variance. The total amount of variance explained after step three was small-to-medium (R^2 = .05). As can be seen in Figure 4.3, higher task orientation was associated with lower anxiety in individual [b = −.28, SE = .11, t (342) = −2.62, p < .01] but not in team sport. However, the simple regression lines also show that until task orientation has reached a certain level (crossing point = 4.29), athletes experienced higher anxiety in individual than in team sports, which was significantly different (b = −.24, SE = .10, t = −2.25, p < .05) at low task orientation (1 SD below the mean). The regression coefficients for this interaction effect were not significantly different between contexts.

Table 4.2

Goal orientations predicting Outcomes in Two Contexts (N = 348)

		Training					Competition				
		B	*SE*	β	*t*	sr^2	*B*	*SE*	β	*t*	sr^2
Effort											
Step 1	Gender	.03	.09	.02	0.32	.00	−.14	.10	−.07	−1.30	.00
Step 2	Type of sport (TS)	.20	.09	.12	2.36*	.01	.36	.10	.19	3.53***	.03
	Task orient. (TO)	.57	.08	.37	7.34***	.13	.24	.10	.14	2.38*	.02
	Ego orient. (EO)	.07	.07	.05	1.03	.00	.16	.09	.10	1.78	.01
Step 3	EO x TO	.23	.12	.10	1.96	.01	−.47	.15	−.18	−3.14**	.03
Step 4	EO x TO x TS	−.24	.23	−.08	−1.04	.00	.73	.30	.18	2.44**	.02

Notes: Interaction effects are displayed when the effect was significant in at least one context; Gender and Type of Sport were coded as: '0' for males and individual sports, and '1' for females and team sports; orient. = orientation.

*$p < .05$; **$p \leq .01$; ***$p \leq .001$.

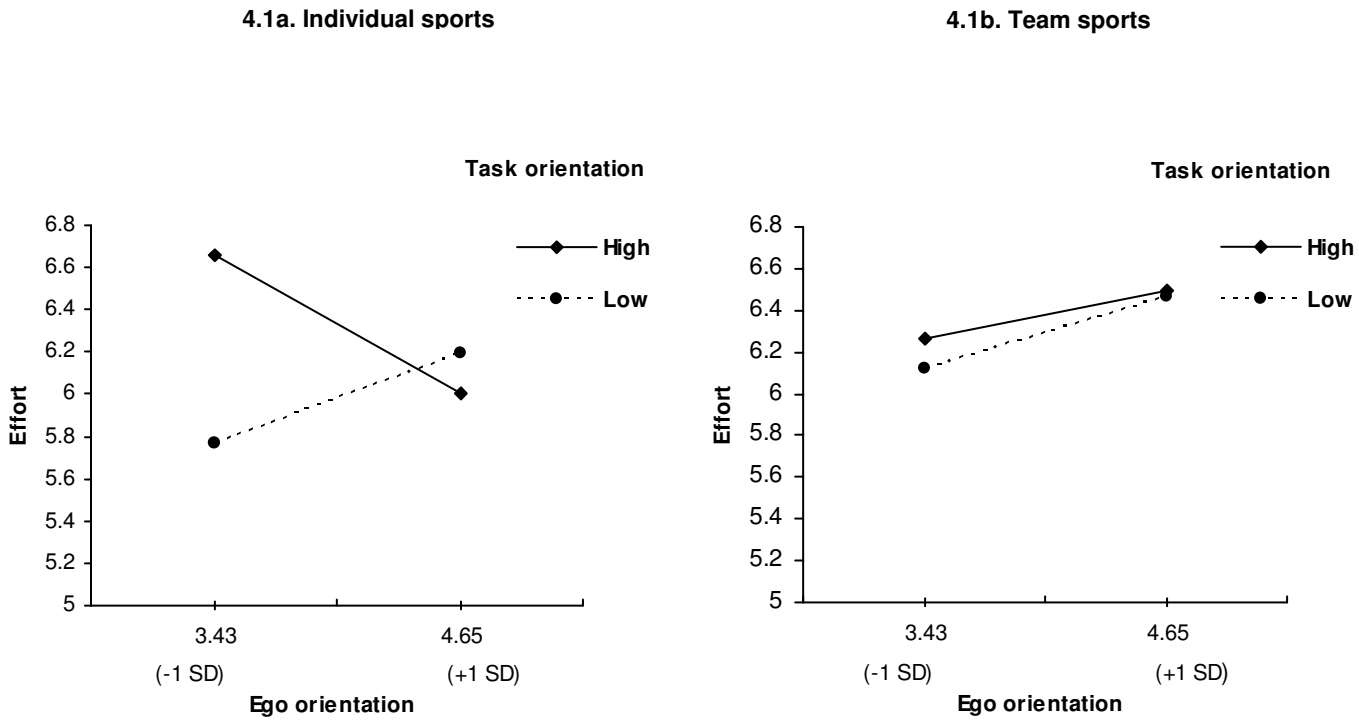

Figure 4.1. Simple regression lines for effort in competition on ego orientation at high and low values of task orientation for individual (4.1a) and team sports (4.1b).

Table 4.2 Continues

Goal orientations predicting Outcomes in Two Contexts (N = 348)

		Training					Competition				
		B	*SE*	β	*t*	sr^2	*B*	*SE*	β	*t*	sr^2
Enjoyment/interest											
Step 1	Gender	−.24	.11	−.12	−2.27*	.01	−.22	.10	−.13	−2.36*	.02
Step 2	Type of sport	.02	.10	.01	0.23	.00	.35	.09	.20	4.20***	.04
	Task orientation	.46	.09	.27	5.05***	.07	.46	.09	.29	5.28***	.06
	Ego orientation	.05	.08	.03	0.57	.00	.28	.08	.19	3.62***	.03
Step 3	TO x TS	.07	.18	.03	0.39	.00	−.38	.15	−.17	−2.50*	.01

Notes: Interaction effects are displayed when the effect was significant in at least one context; Gender and Type of Sport were coded as: '0' for males and individual sports, and '1' for females and team sports; orient. = orientation.

*$p < .05$; **$p \leq .01$; ***$p \leq .001$.

.

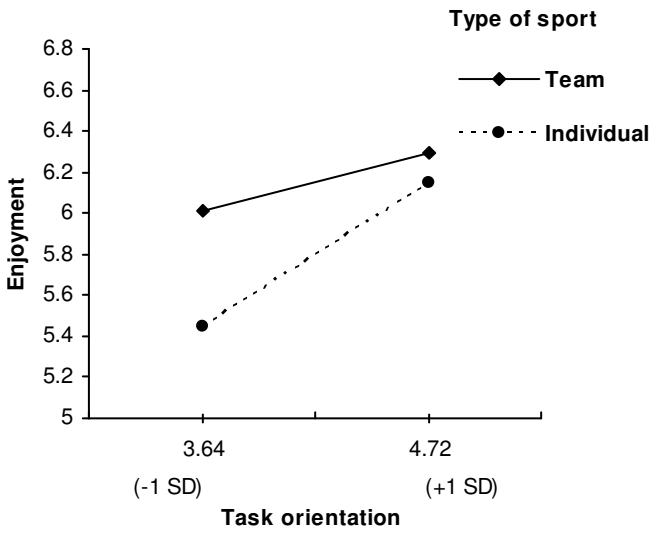

Figure 4.2. Simple regression lines for enjoyment in competition on task orientation for individual and team sports

Table 4.2 Continues

Goal orientations predicting Outcomes in Two Contexts (N = 348)

		Training					Competition				
		B	*SE*	β	*t*	sr^2	*B*	*SE*	β	*t*	sr^2
Trait Anxiety											
Step 1	Gender	−.02	.07	−.01	−0.24	.00	.21	.07	.15	2.77**	.02
Step 2	Type of sport	−.04	.07	−.02	−0.45	.00	−.04	.08	−.03	−0.56	.00
	Task orientation	.04	.07	.03	0.58	.00	−.09	.08	−.07	−1.14	.00
	Ego orientation	.06	.06	.06	1.05	.00	.06	.07	.05	0.81	.00
Step 3	TO x TS	.34	.14	.20	2.47*[a]	.02	.36	.14	.20	2.64**	.02

Notes: Interaction effects are displayed when the effect was significant in at least one context; Gender and Type of Sport were coded as: '0' for males and individual sports, and '1' for females and team sports; orient. = orientation; [a] *F* for this regression set was not significant; *$p < .05$; **$p \leq .01$; ***$p \leq .001$.

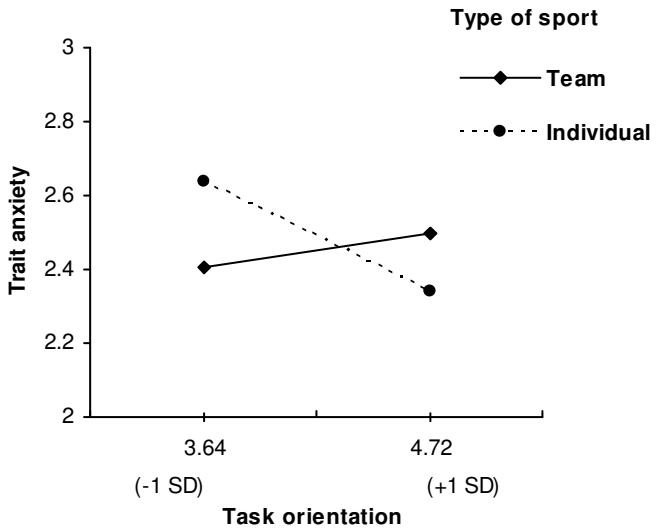

Figure 4.3. Simple regression lines for trait anxiety in competition on task orientation for individual and team sports

Discussion

Training and competition are the two core sub-contexts of sport. However, this distinction has been largely overlooked in achievement goal research. Recent empirical evidence in tennis and football indicates that athletes may endorse context-specific goals in training and competition which may differently relate to motivational outcomes within each context (van de Pol & Kavussanu, 2011; van de Pol et al., 2011). In this study, we aimed to extend this work by utilizing a diverse sample of athletes and examining whether sport type moderates the effects of the context on motivational processes.

Cross-Context Consistency and Differences in Goal Orientations

The first study purpose was to investigate *consistency* and *differences* in goal orientations across training and competition. Similar to previous research in tennis and football (van de Pol & Kavussanu, 2011; van de Pol et al., 2011), both task (r = .42) and ego (r = .39) goals showed medium-to-large consistency across the two contexts. These findings suggest that athletes have a proneness to use *relatively* similar criteria to evaluate success in training and competition. However, cross-context correlations were not very high also suggesting that both goals are sufficiently distinct to merit measuring them with reference to each specific context. Sport type did not moderate these relationships, indicating that the findings are robust as they can be generalised to a variety of individual and team sports.

Mean-level analysis revealed that ego orientation was significantly higher in competition than in training, a finding that supports previous research (van de Pol & Kavussanu, 2011; van de Pol et al., 2011). This was not surprising, because competition inherently involves social comparison and public evaluation and is assumed to enhance ego involvement (Nicholls, 1989). Ego-oriented athletes in both individual *and* team sports seem to be sensitive to these cues, which may have strengthened their tendency to evaluate success using normative criteria in this context compared to training.

In contrast, task orientation did not differ between the two contexts. Although this finding supports previous research in football players (van de Pol et al., 2011), it is not consistent with other research in tennis players, which found that task orientation was higher in training than in competition (van de Pol & Kavussanu, 2011). This inconsistency may be explained by the level of interest/enjoyment athletes reported in each context, as this factor may have affected the degree of task goal endorsement. Specifically, tennis players in van de Pol and Kavussanu's study (2011) reported very similar levels of interest/enjoyment across the two contexts (training, M = 5.29 vs competition, M = 5.34), whereas our participants

reported significantly higher interest/enjoyment in competition (M = 5.90) than in training (M = 5.22, $t(347) = 11.14$, $p < .001$). Research has shown that students high in interest are more likely to endorse task goals than those low in interest (Harackiewicz, Durik, Barron, Linnenbrink-Garcia, & Tauer, 2008). The high level of interest/enjoyment in competition could have strengthened athletes' task orientation in this context, thereby maintaining this goal in competition at high levels. However, this is a tentative explanation awaiting verification from future research.

Cross-Context Relationships between Goals and Outcomes

The second study purpose was to examine whether goal orientations predict effort, enjoyment, and trait anxiety differently across training and competition. We also explored whether sport type moderates these relationships. Below we discuss the study findings as they pertain to each outcome variable.

Effort. In support of our hypothesis and previous research (van de Pol & Kavussanu, 2011; van de Pol et al., 2011), in training, task orientation was a positive predictor of effort, whereas ego orientation was unrelated to effort. These results were consistent across individual and team sport-athletes indicating that athletes could benefit from using self-referenced criteria to evaluate their success in training regardless of the type of sport in which they participate. This finding highlights the importance of promoting task orientation in the training context, as this is the context in which athletes need to work hard to improve their skills. Promoting ego orientation would not confer any benefits for effort in this context.

In competition, the situation was somewhat more complex: Individual-sport athletes exerted highest levels of effort when their task orientation was high and ego orientation was low, suggesting that task orientation is the vital goal for enhancing athletes' effort. Moreover, when ego orientation increased in individual-sport athletes with high task orientation, it reduced the amount of effort they applied in competition. Thus, high ego orientation may

diminish the benefits of a high task orientation on effort in competition. However, in individual-sport athletes with low task orientation, an increase in ego orientation corresponded to more effort, suggesting that for these athletes high ego orientation may be beneficial for effort in competition.

This is an interesting finding that highlights the importance of examining the interaction between task and ego goal orientations, as the relationship between each goal and effort in competition, in individual sports, is clearly dependent on the levels of the other goal. To our knowledge, only one other study has examined the relationships between goal orientations and effort in competition in individual sports (van de Pol & Kavussanu, 2011). This study also found that in tennis, task orientation was the critical goal for enhancing effort; also, high ego orientation corresponded to more effort than low ego orientation when task orientation was low. Thus, our findings support this research but also suggest that task and ego orientation may interact in complex ways in affecting effort in competition in individual sports. Future research needs to further examine this issue.

Task orientation was unrelated to effort in competition in team-sport athletes, a finding inconsistent with previous research in football, which showed that task orientation was positively related to effort in this context (van de Pol et al., 2011). It is not entirely clear why task orientation did not predict team-sport athletes' effort. Perhaps a focus on the team performance made it more difficult for team-sport athletes to experience a sense of *personal* accomplishment compared to individual-sport athletes, which is a vital criterion for task-oriented individuals to apply high effort (Nicholls, 1989). Future research needs to further examine the relationship between task orientation and effort in competition in team sports.

Enjoyment. Task orientation was the only goal to predict enjoyment in training in both sport types, a finding that supports previous research (van de Pol & Kavussanu, 2011) and reinforces the value of this goal in achievement contexts. This finding is important because

training is the context in which athletes typically spend most of their time. Enjoying participation in this context means that not only they are more likely to continue participating in their sport, but also apply higher effort which should lead to skill development and eventually higher performance in competition. Although ego orientation did not appear harmful for enjoyment in training, it did not seem to confer any benefits either.

In competition, task orientation predicted enjoyment in both sport types; interestingly, this prediction was significantly stronger in individual than in team sports. Personal control and personal accomplishment are viewed as important sources for sport enjoyment (Scanlan & Lewthwaite, 1986). Task-oriented athletes in individual sports may perceive a greater control and clearer perspective of personal goal accomplishment compared to those in team sports, where personal success is intertwined with overall team performance. However, it is worth noting that team-sport athletes experienced higher overall levels of enjoyment. Perhaps other sources of enjoyment which have been found to be more strongly associated with team sports than individual sports such as 'affiliation with peers' (McCarthy, Jones, Clark-Carter, 2008) may have led to (extra) team-sport enjoyment in competition.

Finally, ego orientation positively predicted enjoyment in competition across both sport types, a finding that makes sense, but is inconsistent with previous research (Biddle et al., 2003; van de Pol & Kavussanu, 2011; van de Pol et al., 2011). It has been suggested that enjoyment for ego-oriented individuals in competition should depend on their normative success achieved in this context (Nicholls, 1989). Although we do not have these data, on average, our participants may have had a positive win/loss record of competitive matches/races, during the season in which data were collected, which may explain why ego orientation predicted enjoyment in this context. However, this is a very tentative explanation. Future research could examine the moderating role of competitive outcomes in the relationship between ego orientation and enjoyment.

Trait anxiety. In training, trait anxiety was not predicted by either goal. This finding is partially consistent with past research that also reported null finding in training for ego orientation and tension (van de Pol et al., 2011), which is considered an expression of trait anxiety; ego orientation was negatively related to tension only when athletes perceived a high performance motivational climate in their team, suggesting that measuring the climate should enhance our understanding of the relationship between ego orientation and trait anxiety in this context. However, the null finding for task orientation is inconsistent with the negative link between task orientation and tension found not only in training (van de Pol et al., 2011) but also in the general domain of sport (White & Zellner, 1996). Future research needs to further examine whether task orientation is related to anxiety in training.

In competition, trait anxiety was negatively predicted by task orientation, but only in individual sports. As argued before, individual-sport athletes may perceive more control over their personal performance in competition compared to team-sport athletes whose individual performance is intertwined with the team performance. Perceived control over a challenging situation – such as the demand to perform in a sport competition – can reduce stress and anxiety (Folkman, 1984; Ntoumanis, & Biddle, 1998), which may explain why task orientation was negatively related to anxiety only in individual sports. Future research could test this provisional explanation by further examining the relationship between goal orientations and competitive anxiety across both sport types with athletes' perceived control as a potential moderator. Ego orientation was unrelated to anxiety in this context which supports previous research (van de Pol et al., 2011). However, future research could further examine this relationship by considering the approach-avoidance dimension in performance (i.e., ego) goals (e.g., Elliot & McGregor, 2001). Specifically, performance-avoidance goals, which express a concern of normative failure instead of success, have been related to anxiety

in previous research (Cury, Elliot, Sarrazin, Da Fonséca, & Rufo, 2002); examining this goal may provide more insights into the present findings.

Practical Implications

Our findings suggest that in order to achieve positive motivational consequences in training for *both* individual and team-sport athletes, coaches need to promote athletes' task orientation in this context. In competition, task orientation was more strongly associated with all outcomes in individual than in team sports. Although ego orientation may lead to enjoyment in competition, high levels of this goal may hinder highly task-oriented athletes in individual sports from maintaining effort in this context. Therefore, considering the benefits of task orientation on effort and trait anxiety in competition, and that a focus on self-referenced competence attainment provides an alternative – more stable – source for enjoyment, coaches should focus on promoting athletes' task orientation in this context and, particularly in individual sports, temper their ego orientation. Finally, as the focus on the team performance may make it more difficult for team-sport athletes to identify personal criteria for success, coaches may pay particular attention in rewarding these athletes on their personal progress and emphasize their individual contribution to the team performance.

Conclusion

In conclusion, our findings suggest that the distinction between training and competition contexts is a valuable one and should be considered when researchers investigate achievement motivation in sport. Although examining achievement goals in the overall domain of sport is worth pursuing, investigating achievement goals in the specific training and competition contexts may provide additional insights into the athletic experience. Our findings also indicate that sport type should be considered in this research as it appears to affect the pattern of findings. Thus, there is value in distinguishing between training and competition, *and* individual and team sports when examining athletes' achievement motivation.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3,* 1-20. doi: 10.1080/17461390300073504

Chelladurai, P., & Saleh, S. D. (1978). Preferred leadership in sports. *Canadian Journal of Applied Sport Sciences, 3,* 85-92.

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155-159. doi: 10.1037/0033-2909.112.1.155

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression / correlation analysis for the behavioral sciences* (3rd ed.). London: Lawrence Erlbaum Associates.

Cury, F., Elliot, A., Sarrazin, P., Da Fonséca, D., & Rufo, M. (2002). The trichotomous achievement goal model and intrinsic motivation: A sequential mediational analysis. *Journal of Experimental Social Psychology, 38,* 473–481.

Duda, J. L., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290-299. doi: 10.1037/0022-0663.84.3.290

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501-519. doi: 10.1037//0022-3514.80.3.501

Folkman, S. (1984). Personal control and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46,* 839-852. doi: 10.1037/0022-3514.46.4.839

Fryer, J. W., & Elliott, A. J. (2007). Stability and change in achievement goals. *Journal of Educational Psychology, 99*, 700-714. doi: 10.1037/0022-0663.99.4.700

Hanrahan, S. J., & Biddle, S. J. H. (2002). Measurement of achievement orientations: psychometric measures, gender, and sport differences. *European Journal of Sport Science 2*, 1-12. doi: 10.1080/17461390200072502

Hanrahan, S. J., & Cerin., E. (2009). Gender, level of participation, and type of sport: Differences in achievement goal orientation and attributional style. *Journal of Science and Medicine in Sport 12,* 508-512. doi:10.1016/j.jsams.2008.01.005

Harackiewicz, J. M., Durik, A. M., Barron, K. E., Linnenbrink-Garcia, L., & Tauer, J. M. (2008). The role of achievement goals in the development of interest: Reciprocal relations between achievement goals, interest, and performance. *Journal of Educational Psychology, 100,* 105-122. doi: 10.1037/0022-0663.100.1.105

Harwood, C. G. (2002). Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *Journal of Applied Sport Psychology, 14*, 106-119.

Harwood, C. G., Spray, C. M., & Keegan, R. J. (2008). Achievement goal theories in sport. In T. Horn (Ed.), *Advances in sport psychology* (3rd Edition). (pp. 157-185). Champaign, IL: Human Kinetics.

Martens, R. (1977). *Sport competition anxiety test*. Champaign, IL: Human Kinetics.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60,* 48-58.

McCarthy, P. J., Jones, M. V., & Clark-Carter, D. (2008). Understanding enjoyment in youth sport: A development perspective. *Psychology of Sport and Exercise, 9*, 142-156. doi:10.1016/j.psychsport.2007.01.005

Neil, R., Mellalieu, S. D., & Hanton, S. (2006). Psychological skills usage and the competitive anxiety response as a function of skill level in rugby union. *Journal of Sports Science and Medicine, 5*, 415-423.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Ntoumanis, N., & Biddle, S. J. H. (1998). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Personality and Individual Differences*, *24*, 773-788. doi: 10.1016/S0191-8869(97)00240-7

Paternoster, R., Brame, R., Mazerolle, P., & Piquero, A. (1998). Using the correct statistical test for the equality of regression coefficients. *Criminology, 36*, 859-866. doi:10.1111/j.1745-9125.1998.tb01268.x

Roberts, G. C., Treasure, D. C., & Balague, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16,* 337-347. doi: 10.1080/02640419808559362

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43,* 450-461. doi: 10.1037/0022-3514.43.3.450

Scanlan, T. K., & Lewthwaite, R. (1986). Social psychological aspects of competition for male youth sport participants: IV. Predictors of enjoyment. *Journal of Sport Psychology, 8*, 25-35.

Smith, R. E., Smoll, F. L., Cumming, S. P., & Grossbard J. R. (2006). Measurement of multidimensional sport performance anxiety in children and adults: The Sport Anxiety Scale-2. *Journal of Sport & Exercise Psychology, 28,* 479-501.

Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics* (5th ed.) Boston, MA: Allyn & Bacon/ Pearson Education Inc.

van de Pol, P. K. C., & Kavussanu, M. (2011). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise, 12*, 176–183. doi: 10.1016/j.psychsport.2010.09.005

van de Pol, P. K. C., Kavussanu, M., & Ring, C. M. (2011). Goal orientations, perceived motivational climate, and motivational outcomes in football: A comparison between training and competition contexts. *Psychology of Sport and Exercise.* Manuscript in revision for publication.

White, S. A., & Zellner, S. R. (1996). The relationship between goal orientation, beliefs about the causes of sport success, and trait anxiety among high school, intercollegiate, and recreational sport participants. *Sport Psychologist, 10,* 58-72.

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47-57.

CHAPTER FIVE

Study four: The Effects of Training and Competition on Achievement Motivation and Performance in a Golf-putting task

Abstract

This study had three purposes: (1) to examine differences in achievement goals and outcomes between an experimental training and competition condition; (2) to investigate whether goals mediated and/or moderated the effects of conditions on outcomes; (3) to examine the relationships between goals and effort, enjoyment, tension, and performance within each condition. Participants (32 males and 28 females; *M* age = 19.12 years) completed a golf-putting task in a training and competition condition, and their self-reported goal involvement, effort, enjoyment and tension, and objective performance were measured in both conditions. Repeated measures revealed that participants had higher task involvement in training than in competition and higher ego involvement, effort, enjoyment and tension in competition than in training. Performance did not differ across the two conditions. Mediation analysis revealed that the effects of condition on effort and enjoyment were mediated by ego involvement. Regression analysis revealed that ego involvement positively predicted effort in training. In competition two interaction effects emerged: first, when task involvement was high, ego involvement was a stronger predictor of effort than when task involvement was low; second, ego involvement positively predicted enjoyment only when task involvement was high. No effects were found for goals on tension in either condition. In competition, ego involvement was associated with better putting performance. Our findings indicate that both task and ego involvement may vary across training and competition, and that variation in ego involvement may explain variations in effort and enjoyment across these conditions. Finally, ego involvement may enhance performance in competition, and having high levels of both goals may be most beneficial for effort and enjoyment in this condition.

Introduction

The sport domain can be subdivided into two core achievement contexts: *training* and *competition*. Training takes a central place in an athlete's sport life as this is the environment where they spend a vast amount of time to develop their sport-specific skills (Baker, Côté, & Abernethy, 2003). Organised training is an interactive environment, in which participants practise alongside each other in order to develop their skills and prepare themselves for competition. Competition is an integral part and defining feature of sport (Duda & Nicholls, 1992). In its purest form, competition involves that one person/team attempt to outperform another in a 'zero-sum' situation; thus one person/team either wins or loses (Stanne, Johnson, & Johnson, 1999; Tauer & Harackiewicz, 2004). Cross-sectional research indicates that these contexts may differentially influence athletes' achievement motivation (e.g., van de Pol & Kavussanu, 2011a; Williams, 1998). However, to date, our understanding of the underlying - causal - mechanisms that may explain potential variations in achievement motivation across these contexts is limited. The present study aimed to address this issue by experimentally testing how these contexts influence motivational processes and outcomes.

One way that training and competition may affect motivation is through the *achievement goals* athletes adopt in each context. According to achievement goal theory (e.g., Nicholls, 1989), individuals' central motive for participating in achievement contexts is to develop or demonstrate competence. The criteria by which competence is evaluated form the basis for two distinct goals, namely *task* and *ego involvement* (Nicholls, 1989). When individuals are task involved, they evaluate competence using self-referenced criteria and feel successful when they learn, master a skill or improve on a task. In contrast, when individuals are ego involved, they evaluate competence using other-referenced criteria and feel successful when they establish normative superiority (Nicholls, 1989).

To date, only a few studies have examined whether achievement goals differ across training and competition. One study found that female softball players were more task involved during training than in game situations but did not differ in ego involvement (Williams, 1998). One other study which examined goal *orientations* - which refer to people's proneness to the two types of involvement (Nicholls, 1989) - found that task orientation was higher in training than in competition in tennis (van de Pol & Kavussanu, 2011a). However, this relationship was not found in football players (van de Pol, Kavussanu, & Ring, 2011) and neither in a sample of athletes from a variety of individual and team sports (van de Pol & Kavussanu, 2011b). Ego orientation was higher in competition than in training in all three studies (van de Pol & Kavussanu, 2011a, 2011b; van de Pol et al., 2011).

An apparent inconsistency in these studies is that ego *involvement* did not differ across the two contexts (Williams, 1998), whereas ego *orientation* was higher in competition than in training (van de Pol & Kavussanu, 2011a, 2011b; van de Pol, et al., 2011). This inconsistency indicates that more research is needed to elucidate how individuals evaluate their success across training and competition as experienced on a situation-specific level (i.e., goal *involvement*). In addition, Williams' study (1998) only examined female softball players. As previous research indicate that males tend to adopt higher ego goals than females (e.g., Marsh, 1994), males may be more sensitive to the normative cues in competition, which could strengthen their ego goal in this context. Thus, research is needed to examine females' *and* males' goal *involvement* across training and competition.

The distinction between training and competition may also influence important achievement outcomes such as *effort*, *enjoyment*, *tension*, and *performance*. A study which compared these motivational outcomes across training and competition showed that football players reported higher self-reported effort, enjoyment, and tension in competition than in training (van de Pol, et al., 2011). Research indicates that competition may increase

performance (e.g., Cooke, Kavussanu, Mcintyre, & Ring, 2011), and more specifically, a recent study found that participants performed better in competition than in a practice trial in a rope skipping task (Woodman, Akehurst, Hardy, & Beattie, 2010).

As goals and outcomes may both vary across training and competition, a potential variation in goals may mediate a potential variation in outcomes across the two contexts. For example, ego orientation has been positively linked to effort (van de Pol & Kavussanu, 2011a); as this goal may increase from training to competition (e.g., van de Pol & Kavussanu, 2011a, 2011b) it may mediate a potential increase in effort from training to competition (van de Pol et al., 2011). Similarly, tension has been negatively linked to task and positively linked to ego orientation in previous research (Biddle, Wang, Kavussanu, & Spray, 2003); hence, a decrease in task involvement and/or an increase in ego involvement from training to competition (van de Pol & Kavussanu, 2011a) may mediate a potential increase in tension from training to competition (van de Pol et al., 2011). The magnitude of this increase in outcomes may depend on the *extent* to which the goals differ across contexts. However, to date, these causal mechanisms have not been examined.

Finally, the distinction between training and competition may influence the relationships between goals and outcomes. As task-involved individuals have an intrinsic desire to improve in training and to perform well in competition, endorsing this goal should be motivationally adaptive in each context. However, the relationships between an ego goal and achievement outcomes may be more different across each context. In training, ego-involved individuals may perceive a lack of challenge to demonstrate normative success as this is not *formally* rewarded in this context; therefore, ego involvement should not be motivationally adaptive in training. In contrast, competition is the ideal context for ego-involved individuals to demonstrate normative competence; therefore endorsing this goal may, for example, lead to an investment in effort. However, the normative success criteria

embedded in competition could make highly ego-involved individuals also worried about receiving an approving evaluation leading them to experience more tension this context. Previous research has shown that in tennis players, task orientation predicted effort and enjoyment positively in both contexts but predicted enjoyment more strongly in competition than in training; in contrast ego orientation predicted effort positively only in competition and only when task orientation was low or average (van de Pol & Kavussanu, 2011a). In football players, task orientation negatively predicted tension in training but not in competition, whereas ego orientation was unrelated to tension in both contexts (van de Pol et al., 2011). Thus previous research indicates support for the contention that the context may influence the relationships between goals and effort, enjoyment, and tension.

Only a few studies have reported significant relationships between goals and performance in sport. In athletics and triathlon, both mastery (i.e., task) and performance approach (i.e., ego) goals were positively associated with better performance in competition (Stoeber & Crombie, 2010; Stoeber, Uphill, & Hotham, 2009). These findings indicate that both task and ego goals may positively affect performance in competition. However, to date, it is unknown if the relationship between goals and performance varies as a function of training and competition. Arguably, the relationship between task involvement and performance should be robust across training and competition, as this goal should facilitate an intrinsic desire to perform well in both contexts (cf. Nicholls, 1989). However, the relationship between ego involvement and performance may differ across contexts. Ego involvement may facilitate performance in competition as this context may evoke the desire to perform well in order to demonstrate normative success, whereas in training this goal should be unrelated to performance as normative success is not *inherently* rewarded in this context. Research is needed to examine these propositions.

The Present Study

The literature reviewed above indicates that there is value in making the distinction between training and competition when examining achievement motivation in sport, but also revealed some limitations. First, so far, all studies that examined contextual influences of training and competition on motivation employed a cross-sectional design (van de Pol & Kavussanu, 2011a, 2011b; van de Pol et al., 2011). Hence, the direction of causality has not been established yet. Second, previous studies have not examined the *relationships* between goals and outcomes across training and competition on a situational level. This is important because it can provide a better understanding of the dynamics that cause potential fluctuations in motivation across the two contexts. Third, potential variation in motivational *outcomes* across the two contexts has not been examined. Examining goals *and* outcomes as a function of training and competition, may answer the important question whether variation in goals causes a variation in outcomes across the two contexts. Furthermore, objective performance is a key outcome in sport but has been overlooked in previous studies that examined the training versus competition distinction.

The present study sought to address these limitations by examining motivational processes and outcomes effort, enjoyment, tension and performance across training and competition in an experimental setting, and had three purposes. The first study purpose was to investigate differences in achievement goals, effort, enjoyment, tension and performance between training and competition. We expected to find higher ego and lower task involvement in competition than in training (e.g., van de Pol & Kavussanu, 2011a) and higher effort, enjoyment, tension and performance in competition than in training (e.g., van de Pol et al., 2011; Tauer & Harackiewicz, 1999, 2004; Woodman et al., 2010). The second study purpose was to examine whether goals mediated and/or moderated the effects of context on outcomes. We expected that a decrease in task involvement would mediate an increase in

tension from training to competition; and an increase in ego involvement from training to competition would mediate an increase in effort, tension and/or performance from training to competition (van de Pol & Kavussanu, 2011a; van de Pol et al., 2011; Williams, 1998). We made no predictions for ego involvement mediating a potential increase in enjoyment, due to a lack of evidence that these variables are correlated (Biddle et al., 2003). The third study purpose was to examine the relationships between goals and effort, enjoyment, tension, and performance within training and competition. We hypothesized that task involvement would positively predict effort, enjoyment, and performance, and negatively predict tension in both contexts; and that ego involvement would be unrelated to effort, tension, and performance in training, but positively predict these outcomes in competition (e.g., Stoeber & Crombie, 2010; van de Pol & Kavussanu, 2011a). Ego involvement was expected to be unrelated to enjoyment in both contexts (Biddle et al., 2003; van de Pol & Kavussanu, 2011a).

Method

Participants

Participants were 32 male and 28 female (*M* age = 19.12 years, *SD* = 0.92 years) right-handed sport and exercise sciences undergraduate students attending a British University, who received course credit for participation. Participants' average years of experience in 'their own main sport' was 7.90 (*SD* = 3.83) years. Participants had no formal experience in playing golf or/and an official golf handicap.

Experimental task and equipment

The experimental task was a golf-putting task, adapted from previous research (Cooke, Kavussanu, McIntyre, & Ring, 2010). The task was self-paced with the participant determining how long to prepare before each putt. The ball was collected after each putt by one of the experimenters. A standard length (90 cm) golf putter was used to putt regular-size golf balls (diameter = 4.27 cm) to a full-size hole (diameter = 10.8 cm; depth = 2.8 cm) from a

distance of 2.4 m. The hole was located 1.5 m from the end and 0.7 m from the side of a 7 m long × 1.4 m flat green artificial putting mat (Cooke, et al., 2010).

Study Design and Achievement Conditions

This experiment employed a repeated measures design, with one within-subjects factor: achievement condition, with two levels: training and competition. Real-life training and competition contexts may vary in the extent to which they are distinct; training may include competitive drills and games, whereas competition may vary in the degree to which winning is emphasized depending on the regulations. We focused in our simulation on aspects which, from our viewpoint, are typical *and* distinctive features of real-life training and competition. Specifically, for training we focused on the feature that this context 'facilitates skill development' and for competition that 'individuals work against each other on a zero-sum basis'. As training has also a specific function in relation to competition, i.e., training *prepares* athletes for competition, we employed a design which represents that reality; the same individuals were followed across both contexts, but in one direction: from training to competition. Under these specifications we created the following conditions.

Training. The purpose of this condition was to create a training setting, which facilitated skill learning/improvement without eliminating the possibility of social comparison. Participants were told that the purpose of the training was to learn and improve the skill of golf putting, and that their improvement would be recorded with a photocamera.

Participants completed the training in pairs, but completed the putting task individually, alternating every block with the other participant. Hence, athletes could focus on their individual skill development but just as in applied training settings - where athletes commonly watch and observe other athletes' performance (e.g., during demonstrations and rest intervals) - social comparison was not ruled out. Each participant performed six blocks of 10 putts. Pilot testing revealed that performance became stable after approximately 40 putts, and thus

the number of putts was selected to prevent potential practice effects when comparing performance across contexts. To facilitate learning, the difficulty of the task (e.g., distance from, and size of, the hole) was tailored to the participants' skill level. A blocked protocol was used because it is more beneficial for novices learning a putting task compared to a random protocol (see Guadagnoli & Lee, 2004).

To further facilitate skill development, the participant who was *not* putting was assigned a learning task that comprised two parts. The first was to watch three golf learning tips on a computer screen as used in previous research (Kavussanu, Morris, & Ring, 2009). The tips included photographs of a golf professional demonstrating the putting technique and brief instructions about how to perform the skill. The first tip concerned 'posture' (and preceded block 1), the second tip 'direction' (and preceded block 3), and the third tip 'timing and distance' (and preceded block 5). As learning may depend on the balance between the amount of provided information and the stage of skill acquisition (Guadagnoli & Lee, 2004), the tips were provided in an incremental pattern: one at a time with the previous tip(s) still accessible. The second element of the learning task was to watch the other participant putting, preceding blocks 2, 4 and 6, to facilitate observational learning, which *in combination* with physical practice better facilitates skill development compared to physical practice alone (Shea, Wright, Wulf, & Whiteacre, 2000). Moreover, observational learning is effective when observing a 'peer' learning the same task, presumably because the observer benefits from error detection and problem solving during this process (Kitsantas, Zimmerman, & Cleary, 2000). The learning tips (task) lasted a standard duration (tips in blocks 1, 3 and 5, lasted 2, 2.5 and 3 minutes, respectively) and the observational learning task lasted until the other participant finished his/her block of 10 putts.

Competition. The purpose of this condition was to create a 'zero-sum' competition in which participants compete against each other on a 'winner-take-all' basis. Each participant

performed 10 putts and alternated with the other participant after each putt. To increase social comparison and evaluation, which is a defining feature of competition (Nicholls, 1989), the putting participant was watched by the waiting participant and the two experimenters next to the golf mat. To control for order effects, participants switched their order of putting after the fifth putt. Participants were told that the purpose of competition was to compete against each other. Then, the scoring system was explained and participants were informed that the winner of the competition was the participant who holed the most balls after 10 putts, or, in case of a draw, the one to hole the ball in a 'sudden death' where each participant made one putt at a time until there was a winner. To further increase social comparison and evaluation, we a) placed a scoreboard showing the number of putts holed at a prominent position adjacent to the golf mat, and b) informed participants that their *individual* performance would be displayed in a rank order with all the other participants on a notice board. Next, we showed the participants the camera that would record their performance. Finally, to further increase competitiveness and the zero-sum aspect, one of the experimenters explicitly announced the interim scores during, and the 'winner' after, the competition, respectively.

Manipulation check

The manipulation check comprised four items specifically developed for this study. Participants were asked to think about the training or competition in which they just participated and indicate its 'purpose'. The items for training (*learn a skill, improve a skill*) and competition (*outperform another, beat another)* were chosen to reflect 'skill development' and 'zero-sum competition', respectively. Participants rated each item on a Likert scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*).

Measures

Goal involvement. Participants' goal involvement was measured with the Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998), which consists of two

six-item subscales measuring task and ego orientation. The stem was adapted to measure goal *involvement* and was for each item: "In training/competition, I felt most successful when…". Example items were: "I worked hard" for task involvement and "I was the best" for ego involvement. Participants responded on a Likert scale, ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). The POSQ has demonstrated very good internal consistency with Cronbach's alpha coefficients of .90 for the task and .84 for the ego orientation subscale (Roberts et al., 1998). The mean for each subscale was computed and used in all analyses. This procedure was followed for all scales used in this study.

Effort, enjoyment/interest and tension/pressure. Three subscales of the Intrinsic Motivation Inventory (IMI; Ryan, 1982) were used to measure effort (5 items), enjoyment/interest (5 items) and tension/pressure (4 items). Participants were asked to think about their experiences during the training/competition, and to respond to each item. Example items used are "I did put a lot of effort into the training/competition", "I enjoyed the training/competition very much", and "I felt very tense during the training/competition". Each item was rated on a Likert scale ranging from 1 (*not at all true*) to 7 (*very true*). These subscales have demonstrated satisfactory to very good reliability in previous research (effort, $\alpha = .84$; enjoyment/interest, $\alpha = .78$, tension/pressure, $\alpha = .68$; McAuley, Duncan, & Tammen, 1989).

Performance. Mean radial error (cm) and number of putts holed were used as measures of performance (Cooke et al., 2010) and were recorded with a camera-based scoring system (Neumann & Thomas, 2008). For each block of trials, we computed the average distance of the 10 balls from the hole and zero was recorded for holed putts. Number of putts holed was measured, because it allowed us to directly identify a winner in competition to increase the zero-sum element. Participants were informed that their individual performance score would be a combination of the number of putts holed *and* the average distance from the

hole. This was because we wanted in both conditions to encourage participants to take the same approach to putting as in match play golf (i.e., focus on making the putt, but in case of a miss, leave the ball as close to the hole as possible) *and* in competition prevent instances where participants 'give up early' when they realise they cannot win anymore on number of putts holed.

Procedure

Participants were tested in single-sex pairs by two experimenters in a quiet room. Following informed consent, participants completed a demographics questionnaire and were each given a golf club. Next, the golf putting task was explained. Participants then completed the training condition. Then, they completed a questionnaire measuring goal involvement, effort, enjoyment, tension, and a manipulation check, with reference to the training condition. Next, participants completed the competition. After finishing the competition, they again completed a questionnaire measuring the same variables with reference to competition. At the end of the session, participants were debriefed and thanked for their participation. The entire experimental procedure was read out by one of the experimenters, using a standard script developed for this study.

Results

Preliminary Analyses

All scales had good to very good internal consistency, with alpha coefficients ranging from .72 to .96. The correlations among the variables in each context are presented in Table 5.1; values of .10, .30, and .50 are considered small, medium, and large effect sizes, respectively (Cohen, 1992). We found positive large correlations for task, $r = .61$, $p < .001$, and ego, $r = .67$, $p < .001$, involvement, indicating participants used relatively similar criteria to evaluate success in training and competition. The two performance measures were highly correlated (training, $r = -.90$; competition, $r = -.97$), indicating they measured the same

construct. Moreover, mean radial error includes number of putts holed (error = '0') but not vice versa; hence, mean radial error was used subsequently as the measure of performance. On average, participants mean radial error (cm) was 50.91, 36.73, 31.86, 31.27, 28.54, 29.88 and 28.98 during training and competition, respectively. ANOVA revealed that performance only significantly improved from block one to two [$F(1, 58) = 51.20$, $p < .001$, $\eta p^2 = .47$]. Hence, performance was stable before the end of training, and mean radial error of the last training block (i.e., the sixth block) was used as measure of performance in training.

Table 5.1

Zero Order Correlations among Variables in Training and Competition (N=60)

	1	2	3	4	5	6	7
1. Task involvement		.32*	.17	.27*	.03	−.18	.02
2. Ego involvement	.01		.57**	.40**	.15	−.51**	−.31*
3. Effort	.25	.32*		.71**	.25	−.49**	−.49**
4. Enjoyment/interest	−.02	.14	.58**		.18	−.31*	−.35**
5. Tension	.14	.25	.41**	.32*		−.20	−.17
6. Performance	.06	−.33**	.06	.10	−.10		.38**
7. Gender	−.10	−.37**	−.28*	−.15	−.24	−.46**	

Notes: Correlations among variables are presented for training below the diagonal and for competition above the diagonal; gender was coded as '0' for males and '1' for females. $^{*}p < .05$; $^{**}p < .01$

Manipulation Checks

Separate 2 Condition (training, competition) × 2 Gender (male, female) ANOVAs confirmed main effects for context for each perceived purpose (Table 5.2, top). Partial eta-squared (η_p^2) was used as a measure of effect size, and values of .02, .13 and .26 indicate small, medium and large effect sizes, respectively (Cohen, 1992). As expected, participants rated the items that reflected the purpose of training higher in training than competition and rated the items reflecting the purpose of competition higher in competition than training. These results confirmed that our manipulations created two distinct achievement contexts.

Context, Goals and Outcomes

The first study purpose was to examine whether achievement goals and outcomes differ between training and competition. To this end we conducted 2 Condition × 2 Gender repeated measures MANOVAs for goals and outcomes. Significant multivariate effects were followed by ANOVA for each variable. For goals, we found multivariate effects for condition, $F(2, 57) = 22.40$, $p < .001$, $\eta_p^2 = .44$, and gender, $F(2, 57) = 4.54$ $p < .05$, $\eta_p^2 = .14$ (men reported higher ego) but no condition by gender interaction. As can be seen in Table 5.2, participants reported higher task and lower ego involvement in training than competition. For outcomes, multivariate effects were found for condition, $F(4, 55) = 16.68$, $p < .001$, $\eta_p^2 = .55$, and gender, $F(4, 55) = 6.41$, $p < .001$, $\eta^2 p = .32$, but no condition by gender interaction. Univariate analyses (see Table 5.2) revealed that effort, enjoyment, and tension, were all significantly higher in competition than in training. Performance did not differ between contexts. Males performed more accurately and reported more effort and enjoyment than females.

Table 5.2

Manipulation Checks, Goals, and Outcomes as a Function of Context (N=60)

	Training		Competition			
	M	*SD*	*M*	*SD*	*F*(1.58)	η_p^2
Manipulation Checks						
Learn a skill	3.80	0.84	2.38	1.04	73.56***	.56
Improve a skill	4.22	0.49	3.25	0.97	57.10***	.49
Outperform another	2.67	1.05	4.13	0.81	107.35***	.65
Beat another	2.60	1.08	4.22	0.94	96.19***	.62
Goals						
Task involvement	3.96	0.55	3.62	0.84	14.70***	.20
Ego involvement	3.04	0.97	3.56	1.11	22.01***	.28
Outcomes						
Effort	4.90	0.89	5.34	1.04	15.88***	.22
Enjoyment/interest	4.82	0.93	5.53	0.75	28.66***	.33
Tension	3.43	1.23	4.14	1.24	39.25***	.40
Performance (cm)	29.88	18.81	28.98	21.46	0.18	.00

Note: *** $p \leq .001$

Context Effects on Outcomes with Goals as Mediator and/or Moderator

The second study purpose was to examine whether goals mediated and/or moderated the effects of context on effort, enjoyment, tension, and performance. To address this purpose we used the difference/sum regression analysis (Judd, Kenny and McClelland, 2001). We

controlled for gender as this variable was correlated with ego involvement in both contexts (see Table 5.1). A prerequisite for these analyses is that there must be a difference in the mediating and in the outcome variable across the two contexts and both in the same direction, and the mediator must be significantly related to the outcomes. These requirements were met for ego involvement, effort, and enjoyment, but not for task involvement, tension and performance (see Tables 5.1 and 5.2). Then, regression analyses were conducted to predict the difference in effort, enjoyment, and tension in training versus competition from: a) the difference in goal involvement across the two contexts; and b) the mean-centered sum of goal involvement in the two contexts. If the context *difference* in goal involvement predicts the difference in an outcome, then mediation is inferred. However, when the intercept remains significantly different from zero this indicates partial mediation. If the mean-centered *sum* predicts the difference in an outcome, then there is evidence for moderation.

To protect against Type I error without increasing the risk of Type II error, we examined individual regression coefficients only when the *F*-test for the overall model was significant (Cohen, Cohen, West, & Aiken, 2003); this procedure was followed for all regression analyses we conducted in this study. The increase in ego involvement from training to competition predicted the increase in effort [$B = 0.28$, $SE = 0.12$, $t(3, 56) = 2.31$, $p < .05$] and enjoyment [$B = 0.40$, $SE = 0.15$, $t(3, 56) = 2.74$, $p < .01$]. The overall model was significant for both effort, $F = 4.89$, $p < .01$, and enjoyment, $F = 3.96$, $p = .01$. The intercept remained significantly different from zero for both effort ($B = 0.49$, $SE = 0.15$, $t = 3.18$, $p < .01$) and enjoyment ($B = 0.56$, $SE = 0.18$, $t = 3.05$, $p < .01$). Thus, ego involvement *partially* mediated the effects of the context on both outcomes. The difference in effort and enjoyment was not predicted by the mean-centered sum of ego involvement, providing no evidence for moderation.

Relationships between Goals and Outcomes within each Context

The third study purpose was to examine the relationships between goal involvement and effort, enjoyment, tension, and performance within the training and competition. To this end, we conducted hierarchical regression analyses. Before entering the variables in the regression model, task and ego goals were centered to avoid non-essential multi-collinearity in interaction terms, and interaction terms were formed by multiplying the centered predictors (Aiken & West, 1991). Then, we entered: gender in the first step to control for its effects; goals in the second step to examine main effects; and the cross-product of task and ego goals in the third step to investigate 2-way interaction effects.

Significant interaction effects were explored further by: a) plotting two simple regression lines corresponding to the regression of the outcome variable on the predictor at low (1 *SD* below the mean) and high (1 *SD* above the mean) values of the moderator; and b) testing whether the slopes of the simple regression lines were significantly different from zero (Aiken & West, 1991). The two goals were correlated in competition (see Table 5.1); therefore, we used the squared semi-partial correlation coefficient (sr^2) as an effect size of the unique contribution of each goal to the total variance (R^2) of each outcome. Values of .01, .09, and .25 for sr^2 indicate small, medium, and large effect sizes, respectively (Cohen et al., 2003). Results of these analyses are presented in Table 5.3.

Effort. In training, effort was positively predicted only by ego involvement. The overall model for this step was significant, $F(3, 56) = 4.24$, $p < .01$, accounting for a small-to-medium ($\Delta R^2 = .11$) amount of variance. In competition, ego involvement (X) positively interacted with task involvement (Z) in predicting effort ($\hat{Y} = .43X + .13Z + .21XZ + 5.58$). Although we also found main effects for ego involvement, we have interpreted only the higher order interaction effect, as recommended by Aiken and West (1991). The overall

model for this step was significant, $F(4, 55) = 12.24$, $p < .001$, and accounted for a small-to-medium ($\Delta R^2 = .04$) amount of unique variance.

Probing this interaction (Figure 5.1) showed that as ego involvement increased, effort also increased when task involvement was low [$B = .26$, $SE = .13$, $t = 2.01$, $p = .05$] or high [$B = .61$, $SE = .14$, $t = 4.34$, $p < .001$]. This positive association between ego involvement and effort was stronger for high (i.e., a steeper positive slope) than for low task involvement. Thus, effort was highest when participants had high levels of both goals. The total amount of variance explained by steps 2 and 3 was medium-to-large ($R^2 = .23$).

Enjoyment. No main effects were found for goals on enjoyment in either context. However, in competition, ego involvement (X) interacted again with task involvement (Z) in predicting enjoyment ($\hat{Y} = .18X + .26Z + .18XZ + 5.63$). The overall model for this step was significant, $F(4, 55) = 6.09$, $p < .001$, and accounted for a small-to-medium ($\Delta R^2 = .06$) amount of variance. Probing this interaction effect (Figure 5.2) showed that as ego involvement increased, enjoyment also increased when task involvement was high ($B = 0.33$, $SE = 0.11$, $t = 3.03$, $p < .01$). However, ego involvement was not significantly associated with enjoyment when task involvement was low. The total amount of variance explained by steps 2 and 3 was medium-to-large ($\Delta R^2 = .15$).

Tension. No significant main or interaction effects were found for goals on tension in either context.

Performance. We found only one main effect for performance: In competition, ego involvement predicted performance negatively, indicating that this goal was associated with lower mean radial error, and thus better putting performance. The overall model for this step was significant, $F(3, 56) = 8.51$, $p < .01$, and accounted for a medium-to-large ($\Delta R^2 = .17$) amount of variance.

Table 5.3

Goals predicting Outcomes in each Context (N = 60)

		Training				Competition			
		B	*SE*	β	sr^2	*B*	*SE*	β	sr^2
Effort									
Step 1	Gender	−0.50	0.22	−.28*	.08	1.01	0.24	.49***	.24
Step 2	Task inv. (TI)	0.37	0.20	.23	.05	0.04	0.13	.03	.00
	Ego inv. (EI)	0.24	0.12	.26*	.06	0.42	0.11	.45***	.16
Step 3	TI x EI	0.06	0.18	.04	.00	0.21	0.10	.22*	.04
Enjoyment/interest									
Step 1	Gender	0.27	0.24	.15	.02	0.52	0.18	.35**	.12
Step 2	Task inv.	−0.05	0.22	−.03	.00	0.18	0.11	.20	.03
	Ego inv.	0.09	0.14	.10	.01	0.17	0.09	.25	.05
Step 3	TI x EI	0.34	0.21	.22	.05	0.18	0.08	.27*	.06
Tension									
Step 1	Gender	−0.60	0.31	−.24	.06	−0.41	0.32	−.17	.03
Step 2	Task inv.	0.27	0.28	.12	.01	−0.01	0.21	−.01	.01
	Ego inv.	0.23	0.17	.18	.03	0.12	0.16	.11	.01
Performance									
Step 1	Gender	17.25	4.36	.46***	.21	16.15	5.18	.38**	.14
Step 2	Task inv.	3.57	3.95	.11	.01	−1.51	3.00	−.06	.00
	Ego inv.	−3.55	2.40	−.18	.03	−7.87	2.39	−.41**	.13

Notes: Interaction effects are displayed when the effect was significant in at least one context; Gender was coded as: '0' for males and '1' for females; inv. = involvement; * $p < .05$; ** $p \leq .01$; *** $p \leq .001$.

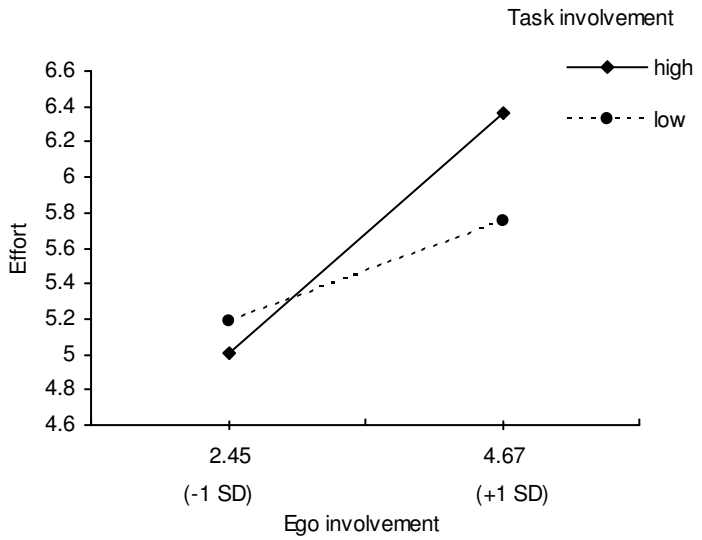

Figure 5.1. Simple regression lines for effort in competition on ego involvement at high and low task involvement.

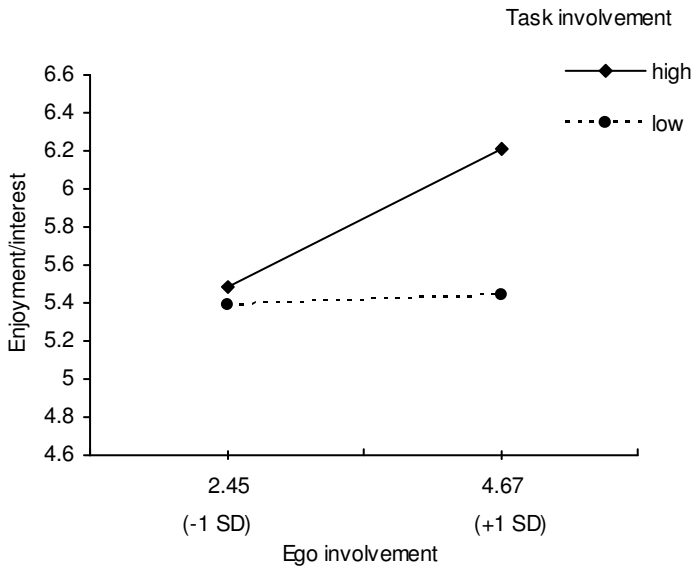

Figure 5.2. Simple regression lines for enjoyment/interest in competition on ego involvement at high and low task involvement**.**

Discussion

Training and competition are the two core sub-contexts of sport. Previous cross-sectional research indicates that athletes may vary their goals across training and competition which may differently relate to motivational outcomes within each context (van de Pol & Kavussanu, 2011a, 2011b; van de Pol et al., 2011). However, to date, our understanding in the underlying mechanisms of these contextual processes is limited. Our study aimed to address this issue by experimentally examining achievement goals and their relationships with achievement outcomes *across* and *within* training and competition.

Goals and Outcomes across Contexts

Participants had higher task and lower ego involvement in training than in competition, which support our hypotheses and previous cross-sectional research in goal orientations in tennis players (van de Pol & Kavussanu, 2011a). The current findings indicate that people can experience various degrees of task and ego involvement in the specific contexts of training and competition (cf. Duda, 2001), and that a context that facilitates learning - as our training - promotes task involvement, whereas competition promotes ego involvement (Nicholls, 1989).

Our findings show an inconsistency with the findings of the only other study that examined *situational* goal involvement: ego involvement did *not* differ across a practice and game in female softball players (Williams, 1998). Considering that in our study males *and* females increased their ego involvement, gender may not explain this discrepancy (cf. Williams, 1998). However, our participants endorsed higher levels of ego goals compared to Williams' (1998) participants. Perhaps a minimum level of ego involvement is necessary to make athletes susceptible to increase their goal involvement in competition (cf. van de Pol & Kavussanu, 2011a). In addition, in our study, goals were measured *after* the training and competition, whereas in Williams' (1998) study the goals were measured *before* the practice

and game (i.e., "I will be most successful if…"). A pre-and post assessment of goals may differ because performance and outcome are experienced between these time moments (Harwood, Hardy, & Swain, 2000), and may explain the inconsistency with Williams' study for ego involvement. Specifically, athletes' desire to outperform their opponent may increase during a match when experiencing a strong rivalry. As such competitive cues and their *strength* can not always be anticipated, prospective and retrospective assessments of ego goal involvement may vary. This speculative explanation needs to be verified in future research.

Participants reported higher effort, enjoyment, and tension in competition than in training, which support our hypotheses and previous findings in football players (van de Pol et al., 2011). Competition can increase the level of perceived challenge, excitement, and importance of doing well, which may explain why outcomes increased in competition (e.g., Tauer, & Harackiewicz, 2004). Our study showed that the increase in ego involvement mediated the increase in effort and enjoyment, from training to competition. This may suggest that when athletes make the transition from training to competition, it may not be necessary to temper ego involvement with respect to effort and enjoyment. However, this tentative suggestion is not indisputable, as competition - and in particular a 'zero-sum competition' - has been considered as potentially motivational maladaptive because of its 'negative outcome interdependence', which means that people can only reach their goal at expense of others (cf. Stanne et al., 1999). Our competition may have led to more effort and enjoyment because it met certain conditions that facilitated these positive effects, which are that both participants had a reasonable chance of winning (the average difference in putts holed in competition between the two opponents was, $M = 1.43$, possible range = 1-10), the rules for winning were clearly defined, and participants were able to monitor each other's progress (Stanne et al., 1999). Thus, the positive effects on effort and enjoyment need to be interpreted considering these aspects of our competition.

Performance did not differ between the two contexts, which was surprising as the higher level of reported effort and enjoyment in competition could have led to better performance in this context (e.g., Cooke et al., 2011). This may indicate that these potential performance enhancers have been balanced out by other maladaptive factors, such as physical - somatic - tension/anxiety. To compare, using a similar putting task, Cooke et al. (2010) found that increased muscle tension (partially) mediated a decline in performance under increased pressure manipulations, whereas cognitive anxiety did not mediate this performance reduction. Thus, despite that in the current study *feelings* of tension were unrelated to performance it may be well possible that physical expressions of tension (e.g., muscle tension) impaired performance on this 'fine motor skill' when competition increased (cf. Hardy & Hutchinson, 2007). Future research should verify these explanations.

Goals and Outcomes within each Context

We also examined the relationships between goals and achievement outcomes within each context. In training, ego involvement positively predicted effort, which was surprising when considering that the training was created and perceived as learning-oriented, and normative success was not rewarded in this condition. However, just as in a 'real-life' training setting, participants were able to observe each other's performance, and thus social comparison information was available in this context. Hence, even though normative success was not rewarded, ego involvement may have promoted effort in training because participants with high levels of this goal wanted to demonstrate normative competence during the training (cf. Lochbaum & Roberts, 1993). Another explanation is that these participants put effort in the training because of the awareness that this investment could help them to obtain the desired normative success in competition (cf. Wilson, Hardy, & Harwood, 2006).

Contrary to our hypotheses and previous research (Biddle et al., 2003; van de Pol & Kavussanu, 2011a, 2011b; van de Pol et al., 2011), task involvement did not predict effort and

enjoyment in training. These null findings may be explained by our experimental task which was relatively easy leading participants to plateau their performance at an early stage in training. Hence, as the lack of relationship ($r = -.02$) between task involvement and enjoyment/interest in training indicates, it may be possible that in terms of learning the putting task was not interesting and challenging enough for task involved participants. It would be interesting to replicate the findings on a task with an incremental level of difficulty, for example by varying the distance from - and size of - the hole; this may provide task involved individuals a more challenging opportunity for personal skill improvement through effort and may increase their enjoyment.

In competition, having high levels of *both* goals led to the highest levels of effort and enjoyment. These findings have two important implications. First, it is not needed to temper ego involvement in competition as this goal is *not* detrimental for effort and enjoyment in this context. Second, task involvement needs to be maintained at a high level. Although an ego goal may in some cases promote effort and enjoyment (cf. van de Pol & Kavussanu, 2011a; van de Pol et al., 2011) it is a vulnerable source of competence on its own as positive effects may depend on the competition outcome (Treasure & Roberts, 1994). Thus, having high levels of both goals may be most beneficial for effort and enjoyment as it provides multiple sources of feeling competent (cf. Roberts, Treasure, & Conroy, 2007).

Considering these interactive goal effects on effort and enjoyment, it is important to highlight that achievement goal researchers have discussed potential problems when modifying a dispositional measure (like the POSQ), which is developed to capture two orthogonal dimensions (which presumes that task and ego goals are unrelated/independent), to asses individuals' goal *states,* which are possible inversely related (cf. Duda, 2001). In view of this, it is important to clarify the exact level of analysis of 'goal involvement' in the present study. The goals in this study essentially reflected (retrospective) competence appraisals with

reference to a specific achievement condition (cf. Duda, 2001). This type of goal involvement (cf. Williams, 1998) may be more exactly considered as a mid-range construct between goal involvement processing states and dispositional goal orientations (Duda, 2001). Hence, goal processing states may - arguably - not be experienced simultaneously, whereas goals that tap criteria for success with reference to a specific activity - like our training and competition - may do (Duda, 2001). This indicates that it is conceptually plausible that task and ego goals in the current study interacted with each other in predicting effort and enjoyment in competition.

In both contexts the goals were unrelated to tension. Although in previous research tension has been linked to a task goal negatively, and to an ego goal positively (Biddle et al., 2003; van de Pol et al., 2011), other research has found anxiety - which is an indicator of tension (Martens, 1977) - also unrelated to both goals in both training and competition (van de Pol & Kavussanu, 2011b). In view of these inconsistent findings, researchers may further examine the goals-tension relationship across the two contexts by considering the approach-avoidance dimension in mastery (i.e., task) and performance (i.e., ego) goals (e.g., Elliot & McGregor, 2001). Specifically, mastery-avoidance goals which represent striving to avoid absolute and/or intrapersonal incompetence, and performance-avoidance goals which represent striving to avoid normative incompetence, have both been related to tension/anxiety (see Roberts et al., 2007). It may be possible that the relationship between tension and mastery-avoidance goals may prevail particularly in training as worry expressions of not attaining the required skills, and with performance-avoidance goals in competition as worry expressions of performing worse than other competitors; thus examining these goals may provide more insights into the present findings.

In competition, ego involvement also predicted performance, which supports previous field studies that found performance positively related to performance approach (i.e., ego) goals in triathlon and athletics (Stoeber & Crombie, 2010; Stoeber et al., 2009). Considering

the decrease in task and increase in ego involvement from training to competition *and* that only ego involvement predicted performance in competition, this may suggest that participants effectively varied their goal levels from training to competition. That only ego involvement predicted performance may indicate that when fundamental processes of a task are mastered - as occurred in training - a motivational focus on an ego goal in competition may benefit performance. Normative success in competition was clearly defined in absolute standards (i.e., putting more balls in the hole than the opponent results in a win), providing ego involved athletes an accurate performance standard to pursue, which may have facilitated their performance (cf. Senko & Harackiewicz, 2005). Task involvement was unrelated to performance. It may be possible that *instant* benefits of this goal on performance may be difficult to detect because it may take more time that a focus on improvement and mastery emerges into actual performance effects (cf. Tenenbaum, Hall, Calcagnini, Lange, Freeman, & Lloyd, 2001). This explanation may be verified by intervention studies that run over longer time periods.

Limitations of the study and directions for future research

Our findings need to be interpreted in light of some limitations. First, the experimental conditions reflected only partly actual (real-life) training and competition as we created a strong contrast between learning versus 'zero-sum' conditions in training and competition respectively, which in reality may often be less distinct. Second, the experimental conditions typically reflected (elements of) individual sports. It may be a valuable extension of the current findings to integrate cooperative elements in an experimental - training and competition - set up to resemble team sports. Third, the present findings are specific to the laboratory setting; therefore research is needed to test if the findings hold up in the actual sport field. In particular, so far, it is unknown if and how the *relationships* between goals and outcomes vary across training and competition on a situation-specific level in the field;

examining this may explain consistencies and discrepancies between our present study and previous studies conducted in the field on a general level (e.g., van de Pol & Kavussanu, 2011a, 2011b; van de Pol et al., 2011). Finally, the present study examined how situation-specific goals predicted outcomes within each condition; accordingly, these effects cannot be distinguished from the contextual effects (i.e., the influence of objective characteristics) of training and competition on outcomes. In addition, previous research has shown that there can be a discrepancy in the effects of experimentally-induced goals versus 'personal' goals (i.e., the goals held in a condition regardless the instructions which were given): Specifically, during a dart-throwing task, only student's personal goals (i.e., both mastery and performance-approach goals) predicted competence valuation, whereas their experimentally-induced goals were unrelated to this outcome (Ntoumanis, Thogersen-Ntoumani, & Smith, 2009). Thus, it may be a valuable extension of the current findings to examine the relative impact of personal versus experimentally-induced goals on outcomes across training and competition conditions (cf. Ntoumanis et al., 2009).

Conclusion

Our findings suggest that the training and competition distinction may influence individuals' goal involvement in each context, which in turn may explain why important motivational outcomes such as effort and enjoyment may vary across the two contexts. Moreover, different relationships emerged between goals and outcomes within each context, and thus, adaptive patterns of each goal may depend on the context. Hence, a multidimensional contextual approach, which considers that task and ego goals can be both adaptive depending on the achievement context, may enhance our understanding in - and help to optimise - people's achievement motivation (cf. Pintrich, 2000).

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Ames, C. (1992). Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261-271.

Baker, J., Côté, J. & Abernethy, B. (2003). Learning from the experts: Practice activities of expert decision-makers in sport. *Research Quarterly for Exercise and Sport, 74,* 342–347.

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3,* 1–20. doi: 10.1080/17461390300073504

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112,* 155–159.

Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied multiple regression / correlation analysis for the behavioral sciences* (3rd ed.). London: Lawrence Erlbaum Associates.

Cooke, A., Kavussanu, M., McIntyre, D., & Ring, C. M. (2010). Psychological, muscular and kinematic factors mediate performance under pressure. *Psychophysiology, 47,* 1109–1118. doi: 10.1111/j.1469-8986.2010.01021.x

Cooke, A., Kavussanu, M., McIntyre, D., & Ring, C. M. (2011). Effects of competition on endurance performance and the underlying psychological and physiological mechanisms. *Biological Psychology 86*, 370–378. doi:10.1016/j.biopsycho.2011.01.009

Duda, J. L. (2001). Achievement goal 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., & Nicholls, J.G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290–299.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501-519. doi: 10.1037//0022-3514.80.3.501

Guadagnoli, M. A., & Lee, T. D. (2004). Challenge point: A framework for conceptualizing the effects of various practice conditions in motor learning. *Journal of Motor Behavior, 36,* 212-224.

Hardy, L., & Hutchinson, A. (2007). Effects of performance anxiety on effort and performance in rock climbing: A test of processing efficiency theory. *Anxiety, Stress, and Coping, 20,* 147–161.

Harwood, C. G., Hardy, L., & Swain, A. (2000). Achievement goals in sport: a critique of conceptual and measurement issues. *Journal of Sport & Exercise Psychology, 22,* 235-255.

Judd, C . M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods, 6*, 115–134.

Kavussanu, M., Morris, R. L., & Ring, C. M. (2009). Effects of achievement goals on performance, enjoyment and practice in a novel motor task. *Journal of Sports Sciences, 27,* 1281–1292.

Kitsantas, A., Zimmerman, B. J., & Cleary, T. (2000). The role of observation and emulation in the development of athletic self-regulation. *Journal of Educational Psychology, 92,* 811–817. doi: 10.1037//0022-0663.92.4.811

Lochbaum, M. R., & Roberts, G. C. (1993). Goal orientations and perceptions of the sport experience. *Journal of Sport & Exercise Psychology, 15*, 160-171.

Marsh, H. (1994). Sport motivation orientations: Beware of jingle- jangle fallacies. *Journal of Sport & Exercise Psychology, 16,* 365–380.

Martens, R. (1977). *Sport competition anxiety test*. Champaign, IL: Human Kinetics.

McAuley, E., Duncan, T., & Tammen, V. V. (1989). Psychometric properties of the Intrinsic Motivation Inventory in a competitive sport setting: A confirmatory factor analysis. *Research Quarterly for Exercise and Sport*, *60,* 48–58.

Neumann, D. L., & Thomas, P. R. (2008). A camera-based scoring system for evaluating performance accuracy during a golf putting task. *Behavior Research Methods, 40*, 892–897. doi: 10.3758/BRM.40.3.892

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Ntoumanis, N., Thogersen-Ntoumani, C., & Smith, A. (2009). Achievement goals, self-handicapping and performance: A 2 x 2 achievement goal perspective. *Journal of Sports Sciences, 27*, 1471-1482.

Pintrich, P. R. (2000). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology*, *25*, 92-104.

Roberts, G. C., Treasure, D. C., & Balague, G. (1998). Achievement goals in sport: The development and validation of the Perception of Success Questionnaire. *Journal of Sports Sciences, 16,* 337-347. doi: 10.1080/02640419808559362

Roberts, G. C., Treasure, D. C., & Conroy, D. E. (2007). Understanding the dynamics of motivation in sport and physical activity: An achievement goal interpretation. In G. Tenenbaum, & R.C. Eklund (Eds), *Handbook of sport psychology* (3rd ed., pp. *3-30).* Hoboken, New Jersey: Wiley & Sons.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, *43,* 450–461. doi: 10.1037/0022-3514.43.3.450

Senko, C., & Harackiewicz, J. M. (2005). Achievement goals, task performance, and interest: Why perceived goal difficulty matters. *Personality and Social Psychology Bulletin, 31,* 1739–1753.

Shea, C. H., Wright, D. L., Wulf, G., Whitacre, C. (2000). Physical and observational practice afford unique learning opportunities. *Journal of Motor Behavior, 32*, 27–36.

Stanne, M., Johnson, D., & Johnson, R. (1999). Does competition enhance or inhibit motor performance: A meta-analysis. *Psychological Bulletin, 125,* 133–154.

Stoeber, J., & Crombie, R. (2011). Achievement goals and championship performance: Predicting absolute performance and qualification success. *Psychology of Sport and Exercise, 11,* 513–521. doi:10.1016/j.psychsport.2010.07.007

Stoeber, J., Uphill, M. A., & Hotham, S. (2009). Predicting race performance in triathlon: the role of perfectionism, achievement goals, and personal goal setting. *Journal of Sport & Exercise Psychology, 31*, 211–245.

Tauer, J., & Harackiewicz, J. (1999). Winning isn't everything: Competition, achievement orientation, and intrinsic motivation. *Journal of Experimental Social Psychology, 35,* 209–238.

Tauer, J. M., & Harackiewicz, J. M. (2004). The effects of cooperation and competition on intrinsic motivation and performance. *Journal of Personality and Social Psychology, 86,* 849–861. doi: 10.1037/0022-3514.86.6.849

Tenenbaum, G., Hall, H. K., Calcagnini, N., Lange, R., Freeman, G., & Lloyd, M. (2001). Coping with exertion and negative feedback under competitive and self-standard conditions. *Journal of Applied Social Psychology, 31,* 1582–1626.

Treasure, D. C., & Roberts, G. C. (1994). Cognitive and affective concomitants of task and ego goal orientations during the middle school years. *Journal of Sport & Exercise Psychology, 16,* 15-28.

van de Pol, P. K. C., & Kavussanu, M. (2011a). Achievement goals and motivational responses in tennis: Does the context matter? *Psychology of Sport and Exercise, 12*, 176–183. doi: 10.1016/j.psychsport.2010.09.005

van de Pol, P. K. C., & Kavussanu, M. (2011b). Achievement motivation across training and competition in individual and team sports. *Sport, Exercise, and Performance Psychology.* Manuscript in revision for publication.

van de Pol, P. K. C., Kavussanu, M., & Ring, C. M. (2011). Goal orientations, perceived motivational climate, and motivational outcomes in football: A comparison between training and competition contexts. *Psychology of Sport and Exercise.* Manuscript in revision for publication.

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47–57.

Wilson, K. M., Hardy, L., & Harwood, C. G. (2006). Investigating the relationship between achievement goals and process goals in rugby union players. *Journal of Applied Sport Psychology, 18*, 297-311.

Woodman, T., Akehurst, S., Hardy, L., & Beattie, S. (2010). Self-confidence and performance: A little self-doubt helps *Psychology of Sport and Exercise, 11*, 467–470.

CHAPTER SIX

GENERAL DISCUSSION

The aim of this thesis was to gain more understanding of the contextual influence of training and competition on athletes' achievement motivation. Within this aim two central purposes were addressed, which also formed the structural core across all the four studies conducted for this thesis: These were to examine: (1) the contextual influence on achievement goals and perceived motivational climate, and (2) the contextual influence on the relationships between goals, perceived motivational climate and achievement responses/outcomes. The following discussion presents an overview of the key findings of this thesis and discusses their theoretical implications. In relation to these purposes it also outlines the limitations of the studies and directions for future research. Finally, the practical implications of the studies are presented, and this chapter ends with an overall conclusion.

Contextual Influence on Goals and Motivational Climate

The first central purpose of this thesis was to examine the contextual influence of training and competition on achievement goals and perceived motivational climate. This purpose was addressed by examining goals' and perceived climates' cross-contextual consistency, and differences at a mean and a within-person level. The findings are discussed below.

Cross-contextual consistency. Goal orientations, which reflected athletes' proneness to be task and/or ego involved in each context, showed medium-to-large cross-contextual consistency (indicated by correlations ranging from $r = .42$ to $r = .62$ for task, and $r = .39$ to $r = .66$ for ego orientation) in the cross-sectional studies (i.e., study one, two, and three). Duda and Nicholls (1992) found - using the same analytical procedure - a large consistency of goal orientations ($r = .67$ for task and $r = .62$ for ego orientation) across the sport and education domains, and argued that this may indicate that individuals have theories of (evaluating) success that may encompass different achievement domains (e.g., domains of sport and schoolwork). Recognizing that our findings merely refer to training and competition contexts,

a similar argument could be made for the current findings: Athletes may have relatively similar criteria to evaluate their success across training and competition, and these goals may be expressions of a general (i.e., higher order) goal orientation in sport. This may suggest that an athlete with a tendency to endorse self-referenced success criteria in training would likely employ these criteria to a certain extent in competition. At the same time, the size of the correlations indicates a potential margin for variability. A similar argument can be made for perceptions of the coach-created motivational climate (as measured in study two) which also was relatively consistent across contexts (mastery climate, $r = .64$; performance climate, $r = .62$). This may suggest that, for example, athletes, who perceive that their coaches - in general - use rewards based on self-referenced criteria in training, perceive that these reward criteria are also used in competition. Again, these correlations were not too high, making these climate perceptions also susceptible to variability.

Finally, when interpreting these findings it needs to be acknowledged that empirical measures may contain measurement errors, which may have reduced or attenuated the magnitude of the cross-contextual correlations: That is, the lack of perfect reliability may have produced a downward bias in the observed correlations, and thus may have led to an overestimation of the potential for contextual variation in goal orientations and perceived climate (cf. Muchinsky, 1996). This potential limitation highlights the value of examining the contextual influence on goals and motivational climate using a multiple analytical approach examining both cross-contextual consistency and differences.

Cross-contextual differences. In study one, tennis players reported higher task orientation in training than in competition and higher ego orientation in competition than in training. In study two, football players reported at both the overall and within-person level higher ego orientation in competition than in training. Task orientation varied in this study only at the within-person level. Then, in study three, athletes from a variety of sports reported

higher ego orientation in competition than in training, whereas task orientation did not differ; type of sport did not influence these effects. Finally, in study four, novice golf players reported higher ego and lower task involvement in competition than in training.

A consistent pattern of these findings is that across all four studies ego goals were higher in competition than in training, both at a dispositional (i.e., goal orientation; study one, two and three) and at a situational level (goal involvement; study four). In addition, these patterns were found across different types of sports, suggesting that these findings may be generalised to individual and team sport athletes. Nicholls (1989) has argued that ego goals (i.e., differentiated concept of competence/ability) can be activated when tasks that involve valued skills are presented (a) as a test of those skills; (b) in a context of interpersonal competition or comparison; or (c) in situations that induce public self-awareness. Competition in sport typically emphasizes these criteria (cf. Harwood, Hardy, & Swain, 2000) which may explain the higher ego goal in this context compared to training. Clearly, training is not free from normative cues, particularly when considering it has also a preparation function in relation to competition, and a common way to design training - and reflects this function - is a 'game based approach' (Martens, 2004), in which competitive elements are integrated in training. However, the vital point here is that training *generally* presents these normative cues - speaking in Nicholls' (1989) terms - in a more "neutral" way *compared* to competition.

Study four, which experimentally simulated training and competition contexts, provided evidence that a changed emphasis from skill development in training to a normative test of these skills increased individuals' ego involvement. Thus, this experimental study confirmed that typical competition cues, such as negative outcome interdependence (e.g., zero-sum element) and social evaluation, increased normative goal striving. This knowledge also supports and complements the findings at a dispositional level (as examined in study one,

two and three), as these cues may underlie a potential development of an athlete's tendency to endorse a stronger ego goal in competition than in training.

With respect to a task goal, the findings of studies two and three - which together represent a large and diverse (i.e., both sexes and both sport types) sample of athletes - suggest that on average this goal remains relatively stable across training and competition. Or in other words, it may indicate that a task goal is relatively unaffected by contextual influences. Conceptually this seems a valid explanation, as this goal reflects the concern with improving one's mastery of tasks rather than with one's ability relative to that of others; accordingly, endorsing this goal requires a less social or external perspective on the self (Nicholls, 1984). However, this interpretation seems too facile. First, in study one task orientation *did* vary at an overall level; tennis players reported lower task orientation in competition than in training. This pattern has also been found in previous research (Tammen, 1998), and suggests that in competition where competence is predominantly rewarded in normative terms, task oriented athletes may have more difficulties to identify criteria on which to base personal progress *compared* to training where these criteria are typically rewarded. Second, the multi-level analytic procedure conducted in study two revealed that task orientation did vary at the within-person level[i] but due to equivalent increases and decreases this variation did not emerge on a mean level.

The only consistent pattern in the data on task orientation is that this goal did not increase from training to competition at an overall level. Hence, the vital question still existed: when and why a task goal remains either 'stable' *or* decreases from training to

[i] An additional analysis conducted for study three, showed a similar pattern for task and ego orientation across training and competition: Computing Reliable Change Index scores indicated that at the within-person level, task orientation showed a more equivalent increase and decrease across training and competition (i.e., decrease was 2.6 %, no change was 92.5%, and increase was 4.9%), whereas ego orientation showed again a tendency to change towards one and the same direction: an increase from training to competition (i.e., decrease was 1.4%, no change was 90.6%, and increase was 8.0%). Hence, this analysis does *not* indicate strong evidence for contextual variation (i.e., the *percentage* of athletes who did not change their goals is high; see also discussion study two, chapter three, p. 83); however, this analysis does provide more understanding in the directions of contextual 'change' in the two goals at the within-person level.

competition. Study four may have contributed in answering this question. When the contextual cues create a strong contrast between learning and skill development (in training) versus strong negative outcome interdependence (in competition) this may reduce people's task involvement. Recognizing that these experimental conditions are only partly representative of real life training settings, athletes may actually deal (to a varying extent) with these distinct achievement criteria when making the continuous transitions between real life training and competition contexts. Accordingly, when athletes actually experience these contrasting cues on a regular basis, they may develop a tendency to have a lower task involvement in competition than in training, as found in tennis players in study one. Importantly, the experiment showed that participants actually picked up these different cues; they perceived a different *purpose* of each condition (i.e., to learn and improve in training versus to outperform others in competition). As people's concepts in defining competence change as their purposes change (Nicholls, 1989), this indicates the importance of the functional value people attribute to an achievement context when examining and interpreting contextual goals.

A construct that gives a central place to *subjective* appraisals of contextual cues is the 'perceived motivational climate'. Contextual differences in the perceived motivational climate were examined in study two. Football players reported at both the overall and within-person level higher perceptions of performance climate in competition than in training, while no difference was found for perceived mastery climate between the two contexts. Thus, despite the potential for variation - indicated by (the size of) the cross contextual correlations - in both types of climate perceptions, only perceived performance climate differed from training to competition. As perceptions referred to *coach-created* climates, this may suggest that the stronger emphasis on normative success and the importance of winning in organised competition may emerge in the criteria coaches adopt to evaluate their players; that is, an

increased emphasis on normative success and/or punitive behaviour when mistakes are made. At the same time, athletes perceived that mastery criteria were rather equally rewarded by their coach across training and competition, which may be due to the fact that these criteria should facilitate success in both contexts.

The contextual influence on the perceived motivational climate also provides an additional insight in explaining the contextual influence on goals. A central tenet in achievement goal theory is that the perceived motivational climate may influence achievement goals[ii]. More specifically, perceived mastery climate should promote a task goal and perceived performance climate an ego goal (Ames, 1992). Hence, a potential contextual variation in the perceived motivational climate may cause a contextual variation in goals. From this perspective, the fact that in study two football players' perceived mastery climate was stable may explain that their task orientation also remained stable, whereas the increase in perceived performance climate could explain why ego orientation increased from training to competition. A supplementary analysis confirmed that performance climate mediated the effects of the context on ego orientation: Specifically, the increase in perceived performance climate mediated the increase in ego orientation from training to competition (see Appendix 1A).

Theoretical Implications

The findings regarding the contextual influence on achievement goals and perceived motivational climate have several implications for achievement goal theory. In general, the findings of this thesis indicate support for the contention that training and competition could influence achievement goals and perceptions of the climate (e.g., Harwood et al., 2000; Harwood, 2002; Harwood, Spray, & Keegan, 2008; Williams, 1998). Regarding the goals,

[ii] Goal orientations can also influence how perceptions of a climate are formed (Duda, 2001; Ntoumanis & Biddle, 1998a). The latter premise was not examined but the correlations in study two (see Table 3.2, p.73) suggest that in both contexts task orientation and perceptions of a mastery climate are more strongly related than ego orientation and perceived performance climate.

previous research already indicated that goals may vary at dispositional and situational levels (Tammen, 1998; Williams, 1998): This thesis built further on this work and verified that the contexts influence the criteria athletes use to evaluate success. However, it also clarified some conceptual inconsistencies in these initial studies. In particular, in contrast to previous research, this thesis found strong support for the increase in an ego goal from training to competition at both a dispositional and situational level. Moreover, the current research clarified the role of gender and type of sport (cf. Williams, 1998), suggesting that the results can be generalised to male and female athletes from a variety of individual and team sports.

The findings of the three cross-sectional studies, taken together, suggest that athletes may have a *tendency* to evaluate success specific to each context, which raises the conceptual issue of the contextual consistency/stability of goal orientations (Duda, 2001). Goal orientations are a proneness to be task or ego involved (Nicholls, 1989) which may suggest that these orientations have some contextual consistency (cf. Duda, Nicholls, 1992). The moderate to large consistency across training and competition indeed indicate that athletes have a proneness to use relatively similar criteria for evaluating their success in each context. However, at the same time, goal orientations also showed some contextual sensitivity (Pintrich, 2000a) as indicated by the significant mean-level differences. Hence, contextual consistency and variability do not rule each other out. Therefore, future examination of contextual influences on motivational processes may benefit from employing a multiple analytical approach, measuring cross-contextual consistency and differences at the overall and within-person level. These different analyses may complement each other in providing a more comprehensive understanding of contextual motivation.

With respect to a situational level of analysis, goal involvement as measured in study four essentially captured appraisals of competence with reference to a specific event (Duda, 2001). This type of goal involvement may be more accurately considered as a construct

between goal involvement processing states (i.e., goal involvement in the strict sense as conceptualised by Nicholls, 1984, 1989) and dispositional goal orientations (see Duda, 2001). This is important to highlight, as processing states may not be experienced simultaneously, whereas goals that tap criteria for success with reference to a specific activity (like training and competition in study four) may do (Duda, 2001). This has also implications for the presumed orthogonality (and thus the potential for interactive effects) of goals, therefore, it is important that the level of analysis is clearly defined when interpreting contextual motivation (Duda, 2001). The fact that this analytical level of 'goal involvement' varied under training and competition manipulations may not be particularly surprising. Hence, it contributes to the 'goal stability discussion' as it confirmed directions, and revealed underlying mechanisms, of situational change. Thus examining contextual motivation can benefit from employing different levels of analysis. Goal assessments at a situational level (e.g., study four) can identify the specific characteristics of training and competition which may influence people's criteria for defining their own success. Accordingly these insights can help explain why goals may have/develop a degree of context specificity at a dispositional level (e.g., study one, two and three).

Task and ego goals were either unrelated (study one, three and four) or weakly correlated (study two) in training, but moderately correlated in competition in all four studies. These findings clearly suggest that the strength of the relationship between the two goals depends on the context and may indicate that in competition the goals are less independent than in training. This further highlights the importance of considering the training versus competition contexts when measuring achievement goals.

Achievement goal researchers have raised the issue that 'general' perceptions of the motivational climate may differ across training and competition contexts (cf. Harwood et al., 2008). Study two addressed this gap in the literature and the findings suggest that perceived

performance climate may be more likely to vary than perceived mastery climate across the two contexts. Thus, there is value in considering that the context may influence the way athletes generally perceive the coach-created motivational climate, paying particular attention to its influence on a performance climate. This line of research has an additional value: A potential variation in subjective appraisals of the achievement environment may contribute to explaining a potential variation in goals across the two contexts.

In study two, mastery and performance climate were found to be relatively independent from each other in competition ($r = -.11$) and training ($r = -.29$). This indicates that the way athletes 'generally' perceive the - coach created - motivational climate in each context may be orthogonal to some extent (cf. Harwood et al., 2008), suggesting that athletes may perceive that their coach could emphasises either or both mastery and performance cues in both contexts. This independence was greater in competition, which suggests that athletes may experience more ambiguity in what is rewarded by their coach in this context, which in turn should not facilitate adaptive achievement striving (cf. Ames, 1992).

Contextual Influence on Goals, Climate and Outcomes

The second central purpose of this thesis was to examine the contextual influence on the relationships between goals, perceived motivational climate and achievement outcomes. To address this purpose, a variety of important cognitive, affective and behavioural outcomes in sport were examined: effort, enjoyment/interest, tension and trait anxiety, psychological skills, and performance. The contextual influence on the relationships between goals, perceived climate and outcomes will first be discussed for each outcome. Then, the theoretical implications regarding this second purpose will be outlined.

Effort. A consistent finding across the three cross-sectional studies was that in training, task orientation was positively associated with effort, whereas ego orientation was unrelated to this outcome. Moreover, study three showed that these relationships were not influenced

by type of sport indicating that they apply to both individual and team-sport athletes. Overall, these findings suggest that training - with its opportunities for skill development - is an ideal context for task oriented athletes, as they have a desire to improve through effort (Nicholls, 1989). At the same time, the contextual emphasis on personal skill development may lead ego oriented athletes to withhold a considerable amount of effort from training as they may perceive that this provides them no direct normative success.

At a situation-specific level, a very different pattern emerged in study four: In training, ego involvement positively predicted effort, whereas task involvement was unrelated to this outcome. These findings may suggest that in terms of learning, the chosen putting task was not challenging enough for task involved individuals, which may have led them to withhold a considerable amount of effort in the training (cf. Nicholls, 1989). At the same time, the awareness of the upcoming competition may have encouraged ego involved individuals to put effort in the training with the prospect that this may help them to obtain the desired normative success in competition (cf. Wilson, Hardy, & Harwood, 2006). This potential positive cross-contextual effect may be specific to a situational level when there is the prospect of an *instant* normative benefit. However, as Nicholls (1989) has argued, the possibility of repeated failures when striving for normative success may make effort less consistent and eventually prevent ego involved athletes from developing further competence. Indeed, as the cross-sectional studies indicate, it is less likely that this goal facilitates *endured* effort in training (cf. Duda, 2001). Finally, a perceived mastery climate in training was also positively related to effort in football players (study two), indicating that when coaches reward effort and improvement in this context this may lead to more effort by athletes in this context.

In competition, task orientation also appeared to be the vital goal for enhancing athletes' effort in tennis and football (i.e., study one and two, respectively). However, the study design of study three allowed an examination of the actual influence of type of sport on these

relationships: It appeared that only in individual sports the relationship between task orientation and effort is robust. This may suggest, that compared to individual sports, the focus on the overall team performance may make it more difficult for team-sport athletes to experience a sense of personal success, which is a fundamental source for task-oriented individuals to apply high effort (Nicholls, 1989).

The role of ego orientation on effort in competition appeared to be intriguing throughout this thesis. In study one, tennis players' ego orientation positively predicted effort in competition when their task orientation was low or average. However, these findings were not replicated in study two, which showed that football players' ego orientation was unrelated to effort. This inconsistency indicated the potential moderating role of sport type, which was confirmed in study three: Only in individual sports a significant relationship between ego orientation and effort emerged. High ego orientation corresponded to more effort than low ego orientation when task orientation was low. Thus, study three not only clarified the role of sport type but also confirmed that - in line with study one - task and ego orientation have a potential to interact with each other in predicting effort. Finally, a 'general' perceived mastery climate positively predicted effort in both contexts indicating support for the benefits of this climate in sport (e.g., Ntoumanis & Biddle, 1999). A perceived performance climate negatively predicted effort, but only in competition. It may be possible that in a context which already (inherently) emphasizes the importance of normative success, perceiving that coaches accentuate the negative consequences of failing to achieve these normative criteria (e.g., punishment for mistakes) becomes particular motivationally detrimental for athletes.

In study four task and ego goals interacted[iii] again with each other in predicting effort, indicating that at a situational level, having high levels of *both* goals is most beneficial for effort in competition. Thus normative goal striving may independently promote effort in competition both at a dispositional (study one) and at a situational level (study four). However, in this context an ego goal may be an even more vulnerable source of effort than in training, as failing to demonstrate normative competence is officially confirmed in (the rules of) competition (e.g., a competitive loss, or/and a drop in a ranking list). However, when ego goal striving is backed up by a strong task goal, this may offer an effective combination: The desire to outperform an opponent during a competitive encounter may provide that extra bit of (needed) effort to actually do it.

Overall, the contextual influence of training and competition strongly emerged in the relationships between goals, perceived motivational climate and effort. The findings suggest that for effort in training only a task orientation is beneficial in individual *and* team sports, whereas an ego goal may have some benefits at a situational level. In contrast, in competition, task *and* ego orientation may confer both beneficial effects at a general level but these benefits may be specific to individual-sport athletes. At a situational level, a combination of high task and ego goals seems beneficial only in competition. Taken together these findings indicate that the interactive effects of task and ego goals on effort may be to some extent specific to competition. Moreover, the relationship between performance climate and effort also appeared to be specific to competition. Besides these different patterns found in each context, the contextual influence on the relationships between goals and effort was

[iii] Goal involvement in study four essentially referred to appraisals of competence with reference to a specific event (Duda, 2001); i.e., the training or competition condition. It is important to highlight the level of analysis here because there has been a debate of the orthogonality of task and ego involvement and if these goal *states* can be experienced simultaneously (cf. Duda, 2001; Harwood & Hardy, 2001). However, as 'goal involvement' in this study referred to participant's appraisals of their criteria of success over the complete training or competition, both goals can have been experienced over this period (cf. Duda, 2001), and thus, it is conceptually plausible that these constructs interacted together in predicting effort and enjoyment.

further confirmed by the different regression coefficients for the effects of ego orientation (study one) and task by ego orientation by sport type (study three) on this outcome.

Enjoyment/interest. In training, task orientation was related positively and ego unrelated to enjoyment/interest in all cross-sectional studies. This may not be surprising, as interest and practice are central indicators of task orientation (Nicholls, 1989). To perform well in any sport, it requires commitment to concentrated sport-specific practice, often over many years (Baker, Côté, & Abernethy, 2003a, 2003b). Accordingly, the tendency to be task involved - in which the process of learning is an end in itself (Nicholls, 1989) - seems to facilitate this long term involvement/interest in skill development. In contrast, the tendency to be ego involved - in which learning and improvement in performance is more a means to an end (Nicholls, 1989) - indicates not to facilitate an endured interest and enjoyment in practising skills in training.

At a situation-specific level, both task and ego goals were unrelated to enjoyment/interest in training, thereby supporting the findings of the cross-sectional studies for an ego but not for a task goal. Perhaps, task involved athletes' interest in training gradually diminished because they perceived no further improvement in their performance (i.e., performance plateaud in an early stage of the training) and/or that the offered learning tasks (e.g., PowerPoint presentation) were not interesting enough. This may reflect a common concern in real life training, where the constant process of practice and skill refinement - of sometimes basic moves for long time periods - can become boring for the athlete (cf. Green-Demers, Pelletier, Stewart, & Gushue, 1998; Keegan, Harwood, Spray, & Lavallee, 2009). Thus, although task involvement and interest/enjoyment are conceptually strongly related (Nicholls, 1989; Deci & Ryan, 2000), the findings of study four indicate that positive associations between these variables do not automatically occur during the practice of a learning task. Accordingly, this may also suggest the importance that training offers enough

personal challenge (e.g., tasks which are not too easy and not too difficult) and variety for task involved individuals in order to sustain their interest and enjoyment in practising skills (Keegan et al., 2009; Nicholls, 1989).

In competition, task orientation predicted enjoyment positively in studies one, two and three. Thus, despite the strong emphasis on normative rewards in competition, a focus on self-referenced success may lead to highest levels of enjoyment and interest in this context. A factor that may explain this is the principle that self-referenced achievement standards are not fixed (i.e., no objective standards). Instead, they are flexible and personal, allowing each athlete to accomplish success and maintain interest in this context independent of the competitive outcome (cf. Dweck & Elliott, 1983; Senko & Harackiewicz, 2005). Study three, however, provided an important nuance in this argument: Task involvement was more strongly associated with enjoyment in individual than in team sports, indicating that personal success standards may be more difficult to detect for team than for individual-sport athletes.

In study three, ego orientation was also positively related to enjoyment in competition in both sport types, a finding which was inconsistent with study one and two, and previous research (see Biddle, Wang, Kavussanu, & Spray, 2003 for a review). Enjoyment/interest for ego-oriented individuals should depend on their obtained normative success (Nicholls, 1989), therefore, this may indicate that participants from study three had, on average, a positive competitive (win/loss) record. However, this is a fixed standard of success and therefore a vulnerable basis for sustained interest and enjoyment in this context. At a situational level, similar to effort, high levels of both task and ego involvement led to the highest levels of enjoyment, which further supports the argument that this combination may be adaptive in sport as it provides multiple sources of competence information (cf. Roberts, Treasure, & Conroy, 2007).

Overall, the contextual influence on the relationships between goals and enjoyment/interest emerged in a different 'optimal' goal balance in each context: In training, an exclusive focus on a task goal seems most beneficial in establishing positive relationships with enjoyment/interest, whereas in competition an ego goal may have a *supplementary* value in relation to this outcome. The contextual influence also emerged in significantly different regression coefficients for the effects of task orientation (study one), and task by ego orientation by sport type (study three), on enjoyment/interest. Finally, a perceived mastery climate was positively related to enjoyment in both contexts (study two) which supports previous research (Ntoumanis & Biddle, 1999). However, this relationship was significantly stronger in training than in competition, indicating further evidence that the two contexts influence motivational processes.

Tension and anxiety. In training, task orientation was negatively related to tension (study two) and trait anxiety (study three), which suggests that self-referenced achievement standards may protect athletes against feeling tensed and anxious, which should facilitate skill development (e.g., Duda, 2001; Ommundsen & Pedersen, 1999). In study two, perceived performance climate was positively related to tension in training. This suggests that, particularly in training, where athletes typically strive for mastery and development of personal skills, contrasting reward criteria such as unequal recognition may create feelings of tension. At the same time, when performance climate was perceived as high, ego orientation was negatively related to tension in training. This indicates that ego-oriented athletes may be able to cope with the potential tension derived from a perceived performance climate: Perhaps because their personal criteria for success are to some extent compatible with the normative criteria emphasized in a performance climate (Ames, 1992).

In competition, trait anxiety was negatively related to task orientation, but only in individual sports (study three). Individual-sport athletes may perceive more control over their

personal performance in competition compared to team-sport athletes whose individual performance is intertwined with the team performance. Perhaps this greater perceived control over their personal accomplishments may make task orientation in individual sports more adaptive in buffering stress and anxiety than in team sports (cf. Folkman, 1984; Ntoumanis, & Biddle, 1998b). This finding may also explain why in study two, goal orientations did not predict tension in competition in football, and further indicates the importance of acknowledging the influence of sport type, particularly in the competition context. Moreover, in contrast to training, perceived performance climate was unrelated to tension in competition. Perhaps because normative comparison and public evaluation is inherent in competition, a coach's emphasis on these criteria is to some extent accepted by athletes and does not result in a significant amount of tension in this context. Perceived mastery climate seemed to be unrelated to tension when measured specifically in training and competition. Finally, goal involvement was unrelated to tension at a situational level in study four. Considering that there was tension reported in both conditions, this suggests that the self versus other-referenced dimension in task and ego goals respectively, was not a critical factor in relation to situational feelings of tension.

In sum, the contextual influence on the relationships between goals and tension, and trait anxiety, emerged via the several dissimilar patterns which were found between contexts. Although task orientation may reduce tension and anxiety in both contexts, only in competition was this relationship influenced by type of sport. The contextual influence also emerged in the effects of the perceived motivational climate; only in training was a perceived performance climate detrimental to tension. Furthermore, the interaction between goals and climate was unique to training; ego orientation may buffer the stressful emotions caused by a performance climate in this context. Besides these context-specific patterns, in study two, the contextual influence also came to the surface via the significantly different regression

coefficients between the two contexts for the effects of task orientation, performance climate, and ego orientation by performance climate, on tension.

Psychological skill use, improvement and performance. With respect to psychological skill use, task orientation was related positively and ego orientation was unrelated to goal setting and self-talk in both contexts, whereas attentional control was not predicted by either goal in either context. These findings indicate support for previous research that also suggests that a task goal is critical in employing these skills (Harwood, Cumming, & Fletcher, 2004; Lochbaum & Roberts, 1993). They also extend this work by examining these relationships with context-specific goal orientations. There was also an indication for a stronger prediction of goal setting by task orientation in training than in competition. That the context influenced this relationship may make sense when considering that previous research has shown that in training, athletes predominantly set process goals (i.e., self-referenced goals like mastering a skill/strategy), whereas in competition, they set a more balanced mix of process and outcome goals (e.g., beating an opponent) (Brawley, Carron, & Widmeyer, 1992).

The importance of considering the distinction between training and competition emerged also in the relationship between goals and *objective* performance; study four showed that ego involvement predicted better golf-putting performance only in competition. That ego involvement predicted performance in competition supports previous field studies that found that performance was also positively related to performance-approach (i.e., ego) goals in triathlon and athletics (Stoeber & Crombie, 2010; Stoeber et al., 2009). This relationship is also from a conceptual viewpoint understandable. Nicholls (1989) has argued that ego involved individuals apply high effort and therefore perform effectively if they believe high effort is necessary to establish normative competence. Thus, considering the high effort this goal evoked this may explain its benefits on performance; a supplementary analysis

confirmed that effort positively mediated the effect of ego involvement on performance (see Appendix 1B). Task involvement was unrelated to performance. Hence, it may be possible that instant benefits of this goal on performance may be more difficult to detect because it may take more time for a focus on the *process* of mastery to lead to actual performance benefits (cf. Tenenbaum, Hall, Calcagnini, Lange, Freeman, & Lloyd, 2001).

The current findings also provide an interesting insight into the distinction between objective and subjective improvement/performance. While an ego goal solely predicted objective performance in competition in study four, a task goal was found as the sole predictor for perceived improvement in training and for performance in competition in study one. Research has examined - and discussed the value of - each in relation to achievement motivation (Balaguer, Duda, Atienza, & Mayo, 2002; Frey, Laguna, & Ravizza, 2003; McAuley & Tammen, 1989). However, the present findings provide a new insight into this issue. That only task orientation was positively related to subjective performance may be due to the flexibility of self-referenced achievement standards, allowing each athlete to feel a sense of success independent of the objective competitive outcome: Thus, a task oriented athlete may detect personal progress in a performance despite losing a match/race based on that performance (cf. Dweck & Elliott, 1983; Senko & Harackiewicz, 2005). Although the flexibility of self-referenced achievement criteria may benefit subjective appraisals of a performance, this may be at the expense of objective performance (cf. Senko & Harackiewicz, 2005). On the contrary, the normative criteria endorsed by ego involved athletes are more concrete and may provide these athletes a more accurate performance standard to pursue, particularly in competition where these normative standards are clearly and objectively defined. Thus, this specificity in normative success criteria may make ego involvement more effective than task involvement in relation to objective performance. In addition, these

findings also re-emphasizes the value of having high levels of both goals as this can - according to this rationale - facilitate both subjective and objective performance.

In sum, although psychological skill use and objective performance were examined only in one study, the results indicate that the context influenced the relationship between goals and psychological skill use (study one) at a more general level, and objective performance (study four) at a situational level. Moreover, the contextual distinction provided more insights into the relationships between goals and objective versus subjective performance, revealing that the functionality of the goals in relation to these outcomes may depend on the context.

Contextual influence on outcomes explained by goals. Study four examined the contextual influence on the goals-outcomes relationship by investigating if a potential variation in goals explains a potential variation in outcomes across the two contexts. This analysis revealed that the increase in effort and enjoyment was explained by an increase in ego involvement, from training to competition. This indicates that the goal which is most susceptible to vary across training and competition, which is ego involvement, may also have the biggest impact on contextual variations in outcomes.

Theoretical Implications

The relationships between goals, perceived motivational climate and outcomes in sport have been extensively examined and well documented in achievement goal theory (see for reviews, Biddle et al., 2003; Harwood et al., 2008; Ntoumanis & Biddle, 1999). However, achievement goal researchers have speculated that adaptive relationships between goals, climate perceptions and outcomes may depend on the contexts of training and competition (Conroy, Cassidy, & Elliot, 2008; Harwood et al., 2000). The current studies were the first to address this issue by measuring *context-specific* goals, perceptions of the motivational climate and outcomes (cf. Harwood et al., 2004; Lochbaum & Roberts, 1993) and provide evidence

that these relationships are indeed influenced by the contexts on both a dispositional and situational level. The theoretical insights which emerged by addressing this issue may have several implications for achievement goal theory.

First, making the contextual distinction of training and competition highlighted the value of examining both main *and* interactive goal effects within each context. Each type of analysis identified unique motivational patterns providing together a more complete picture of the motivational processes within each context (cf. Pintrich, Conley, & Kempler, 2003). For example, this approach provided more insights into the potential benefits of endorsing high levels of *both* task and ego goals. Achievement goal researchers have considered this goal combination as potentially adaptive but also expressed the need to understand when this may occur (Duda, 2001; Harwood et al., 2008; Roberts et al., 2007). This thesis contributed to answering this question in relation to training and competition contexts, and the findings suggest that, generally, in training a high task goal is the most important contributor in establishing positive outcomes, whereas in competition, a moderate to high ego goal can offer additional benefits, particularly on effort, enjoyment and objective performance. Moreover, study three revealed that individual-sport athletes showed more adaptive goal patterns than team-sport athletes and that these effects were specific to competition. This indicates the importance of considering sport type as a moderator variable in examining motivational processes, particularly in competition contexts.

Next, achievement goal researchers have emphasized the need for more understanding when and how dispositional goals and perceptions of the motivational climate interact with each other in predicting achievement outcomes (Duda, 2001; Roberts et al., 2007). Study two revealed that ego orientation predicted tension negatively only when perceived performance climate was high and only in training. This suggests that making the distinction between

training and competition may contribute to identifying goal-climate interactions as these effects may be specific to each context.

Furthermore, task orientation was more strongly associated with all outcomes in individual sports compared to team sports, in competition (study three). It has been suggested that failing to experience a sense of definitive intra-individual mastery or performance could be 'motivationally crippling' for the task-oriented athlete (Harwood & Hardy, 2001). It may be plausible that a focus on the team performance may make it more difficult for team-sport athletes to experience a sense of personal accomplishment compared to individual-sport athletes. Hence, although both individual and team-sport athletes may experience a sense of achievement in the 'process' of performance improvement in competition, individual-sport athletes may be better able to link their self-referenced goal striving to a (more) concrete personal success. This confirmation of self-referenced success (i.e., task product) and its distinctive/complementary benefits from/on the process of self-referenced goal striving (i.e., task process) is highlighted (and conceptualised) by Harwood and Hardy (2001); however, it is not yet established as a distinct valid task goal-subscale. The identified specificity of goal striving in training versus competition and in individual versus team sports may be considered when trying to capture these - proposed - distinct aspects of self-referenced goal striving.

Finally, although achievement goal research in sport tends to increasingly adopt more contemporary theoretical frameworks (in particular the 2 x 2 approach/avoidance model; e.g., Conroy, Elliot, & Hofer, 2003), achievement goal researchers (i.e., Harwood et al., 2008) have advocated that many important motivation issues in sport remain to be addressed using Nicholls' (1984, 1989) concepts. This thesis tried to gain more understanding in one of these issues: The contextual influence of training and competition on the relationships between goals, climate perceptions and achievement outcomes. The findings indicate the (continued) value of Nicholls' dichotomous framework in addressing this specific purpose.

Limitations and Directions for Future Research

In spite of the theoretical and practical insights obtained from the studies of this thesis, it is important to point out some limitations. First, three of the four studies were cross-sectional, thus firm assertions about the directions of causality cannot be made. The studies also relied mainly on self-reported data, which have inherent limitations such as recall accuracy in responses. Furthermore, although a wide variety of athletes were examined with respect to sport type and gender, a shortcoming of the examined population may be the limited variety in age; all participants ranged between 19 to 21 years of age. This is important to consider because people from this age group are assumed to be much more capable of self-regulation - and thereby of 'selecting' the appropriate goals in different contexts - compared to younger people (Pintrich et al., 2003). Thus, caution must be taken in generalizing the current findings to younger age groups. In addition, future research may also consider extending the present findings to a wider variety of athletes with respect to their competition level. It may be that the contrast between normative goal striving across the two contexts is stronger at higher competition levels because normative success is more strongly rewarded (e.g., price money), which may differently influence the relationships between goals, perceived climate and outcomes across the two contexts compared to lower competition levels. Finally, although the athletes in all three cross-sectional studies had an appropriate amount of competitive experience (range: 5.47 to 11.68 years), there was a considerable variability in the number of matches/races in which they had participated during their last competitive season/year. This variability may have influenced athletes' degree of recall accuracy of their competitive experiences.

With respect to the first central purpose, the research focus was on examining contextual consistency versus stability of goals and climate perceptions. However, tendencies to be task and ego involved and general perceptions of the climate may develop over time (Whitehead,

Andree, & Lee, 1997, as cited in Duda, 2001). Hence, an interesting way to extend the current findings is by examining both contextual and temporal stability via a longitudinal design measuring goals and climate in training and competition at different time points during the season. This may give additional insights into when goals become more susceptible to vary across the two contexts. For instance, it may be possible that at the end - the climax - of the season (e.g., promotion/relegation matches), the discrepancy between ego orientation in training and competition is larger compared to the start of the season; this may affect the relationships between this goal and outcomes in each context at these different time points.

The task and ego goal dimensions have been shown to be valuable in understanding feelings of tension and anxiety in sport (see for reviews, Harwood et al., 2008; Ntoumanis & Biddle, 1999), and the current (cross-sectional) studies provided new insights into these relationships with reference to the specific contexts of training and competition. However, the null findings in the experiment (study four) and inconsistencies in the data from the cross-sectional studies (e.g., no *main* effects were found between goals and tension in competition in study two, and anxiety in both contexts in study three) may indicate that other factors in the goals-tension/anxiety relationship need to be considered. One of these factors may be the 'avoidance' dimension in mastery (i.e., task) and performance (i.e., ego) goals (e.g., Elliot & McGregor, 2001). Mastery-avoidance goals which represent striving to avoid absolute and/or intrapersonal incompetence, and performance-avoidance goals which represent striving to avoid normative incompetence, have been both related to tension/anxiety (see for a review, Roberts et al., 2007). The self-presentational concerns inherent in avoidance motives may be more strongly linked to negative affective responses such as tension and anxiety compared to task and ego goals, which convey a desire to develop or demonstrate competence, respectively; this desire does *not* involve an explicit concern for failure and worry.

This chapter proposed some potential variables which may uncover the underlying mechanisms that caused the different relationships between goals and outcomes across the two contexts. For example, potential mediating variables such as 'importance of doing well' and 'perceived challenge' may provide more understanding in the context-specific relationships we found between goals, effort, and enjoyment/interest (cf. Tauer & Harackiewicz, 1999, 2004). More specifically, examining these variables may answer the question why in study one, ego orientation was positively related to effort only in competition: It may be because the 'importance of doing well' is higher for these athletes in this context compared to training. Another variable that needs to be considered is 'perceived control'(over a personal performance): This potential mediator could verify the proposed explanation that task oriented athletes in individual sports better cope with tension and anxiety because they may perceive more personal control over their individual accomplishments compared to task oriented athletes in team sports (cf. Folkman, 1984; Ntoumanis, & Biddle, 1998b).

Another logical extension of the current findings is to consider other outcomes in the relationships with goals and climate perceptions across the two contexts, for instance, 'moral behaviour'. Previous research has linked moral behaviour to goal orientations and perceptions of the motivational climate, and found particularly ego orientation and performance climate to be negatively linked to moral behaviour in sport (Kavussanu & Roberts, 2001; Ommundsen, Roberts, Lemyre, & Treasure, 2003). However, the contextual distinction between training and competition may also influence these relationships. Considering that the emphasis on normative success in competition may evoke more immoral behaviour (e.g., it may 'reduce pro-social impulses and commitment to fair play', Kleiber & Roberts, 1988, as cited in Nicholls, 1989, p. 133) than in training, *and* that the positive predictors of this behaviour - ego orientation and performance climate - tend to increase from

training to competition, it is likely that their negative impact on moral behaviour also increases from training to competition.

The experimental conditions in study four typically reflected (elements of) individual sports. It may be a valuable extension of the current findings to integrate cooperative elements in an experimental training and competition set up, in order to approach a real-life representation of these contexts in *team sports*. Furthermore, the experimental study findings indicated that participants effectively adjusted their goal level from training to competition in facilitating effort and performance. This may indicate the value of providing more insight into these processes by adopting a 'self-regulation' research perspective. The process of self regulation is characterised by the premise that individuals take a more pro-active approach in constructing their own meanings, goals, and strategies based on the information available in the achievement context (Pintrich, 2004). Moreover, according to Fryer and Elliot (2007), achievement goal pursuit represents an important aspect of self regulation as it provides a clear picture of situation-specific strategies that individuals plan to use as well as the outcomes they seek to attain. Therefore, it would be interesting to examine to which extent athletes are able to regulate their achievement goals to the affordances of the training and competition contexts: This can be accomplished via employing 'self-regulation measures' which can assess the monitoring, control, and regulation processes when athletes are making the transition from training to competition (cf. Pintrich, 2000b; Zimmerman, 2000). Hence, bridging achievement goal and self-regulation theories may provide additional insights to understand - and adaptively direct - achievement striving across the two contexts.

At a situation-specific level, the relationships between goals and outcomes were only examined via an experimental design (i.e., study four). As these findings are specific to the laboratory, more research is needed to verify if the results hold up in the actual sport field. Although goals have been examined across a situation-specific training and competition

(Williams, 1998), to date it is unknown if and how the *relationships* between goals and outcomes vary across a specific training and competition. This is a gap in the literature which has not been addressed yet and needs to be examined to complement the current findings.

Another point to consider is that training groups of individual-sport athletes differ from team-sport training groups in terms of cohesion and role clarity; accordingly, this may also result in an intra-group variability in climate perceptions across these groups. In addition, specifically to team sports, the level of agreement in the perceived motivational climate among team members may also differ across training and competition and thus differently influence individual motivational responses across the two contexts (cf. Duda, 2001; Harwood et al., 2008). A way to address this potential 'non independence' of climate perceptions is via multilevel linear modelling' (MLM) which is an appropriate procedure when data are organised in more than one level (e.g., athletes are nested in teams). Capturing this potential variability in climate perceptions was not the intention of this research but could be considered when extending the current findings, particularly when data is organised in different hierarchical levels (with a sufficient sample size at each level; see Tabachnick & Fidell, 2007).

Another valuable extension to the current findings is to examine the influence of the contexts on the coach. For example, study two revealed that the perceived mastery climate remained stable, whereas the perceived performance climate increased from training to competition. Accordingly, it was argued that these differences may depend on what coaches actually reward in each context. To verify these arguments, it is necessary to examine coaches' evaluation criteria for success across training and competition. Previous research indicates that coach behaviour can be situation-specific regarding training and competition contexts (e.g., an instructional orientation *versus* a winning or evaluative orientation, respectively; Horn, 1985). Hence, it may be possible that an increasing importance of

winning in competition also influences coaches' reward behaviour, thereby creating a stronger performance climate in competition than in training. Such an insight into coaches' evaluation criteria for success across training and competition may contribute to explaining a potential variation in goal orientations and climate perceptions across the two contexts. In relation to this, previous research has shown that there can be incongruence between the way coaches perceive their own reward behaviours and how (their) athletes perceive these behaviours (Horne & Carron, 1985). Therefore, it would be interesting to examine the compatibility between what coaches (intend to) reward and athletes' perceptions of the coach-created climate, and how this ultimately affects outcomes, across training and competition.

Finally, the findings of the studies conducted in this thesis were all based on quantitative research methods. Therefore, qualitative methods like phenomenology interviews may complement the current studies in providing a more in-depth understanding of athletes' subjective experiences in relation to training and competition contexts (cf. Dale, 1996); this may, for instance, contribute to explaining why task orientation equally increased and decreased from training to competition at a within-person level, as found in study two.

Practical Implications

The findings of this thesis have several applied implications. The key message for practitioners is that athletes' goals and climate perceptions may differently affect important achievement outcomes - such as effort, enjoyment, tension and performance - across training and competition. The practical implications of this contention will be discussed now in more detail and suggestions will be provided in order to offer practitioners guidelines to facilitate adaptive motivational processes specific to each context. These suggestions will be discussed from a coach perceptive and have been inspired - predominantly - by previous work of Ames (1992), Harwood and Biddle (2002), and Martens (2004).

In training, a task orientation was identified as the essential motivational source for optimizing achievement motivation. Coaches can promote this goal in training by creating a mastery climate via evaluating athletes on self-referenced standards (e.g., giving feedback and instructions based on personal progress criteria) but also - and maybe more important - by teaching them to understand the relevance of these criteria. For example, coaches could involve athletes in the trajectory of skill development by helping them to set their own goals for improvement, and/or try to link the effort athletes invest in training to a desirable personal accomplishment such as acquiring a technical or tactical skill. This should give athletes a sense of control over their practice efforts and develop a personal relevance of training. Moreover, it may facilitate athletes' awareness that mistakes are part of the learning process and should not be experienced as a personal failure (cf. Martens, 2004).

Another aspect that coaches should pay attention to is that training tasks offer enough *challenge*. Coaches can facilitate this by presenting training tasks *near* the upper limit of an athlete's ability, thereby allowing a challenging but attainable goal which should optimise the level of perceived personal success (cf. Martens, 2004). By doing this, coaches need to be careful with setting uniform improvement standards for the entire training group and/or team, which may increase the risk that the less skilled athletes in the group may not attain these standards. Instead, coaches should differentiate the difficulty of a task to the ability of each individual athlete. Training tasks also need to include enough *variety*. Repetitive drills emphasising a single skill may be boring and reduce interest and enjoyment, or may even create tension to execute the skill perfectly in subsequent attempts (Keegan et al., 2009). Therefore, coaches need to present athletes a diversity of drills and activities to keep the process of skill development interesting and enjoyable. Overall, these mastery cues should promote athletes' task orientation, which subsequently may facilitate higher effort and

enjoyment/interest and lower tension, adaptive learning strategies such as investment in psychological skill use, and positive appraisals of personal improvement in this context.

In general, an ego goal may not be detrimental in training: Instead, it may even promote effort in the short term, maybe just because athletes with high levels of this goal want to show their superiority during training or/and because of the prospect that it may help them to eventually achieve normative success in competition. However, the possibility of repeated failures in normative success striving makes it unlikely that this goal will facilitate endured effort which is needed for skill development in training. Thus, although ego involvement may not be harmful in training, coaches should avoid normative comparison and public evaluation nonetheless as this may lead athletes to perceive the motivational climate as 'performance oriented'. However, training often involves selection procedures for an upcoming competition: This may promote social comparison and intra-group rivalry which may reduce athletes' effort and evoke tension. Although these selection procedures, particularly at higher competition levels, may be unavoidable, coaches can minimise their negative effects by making the selection criteria transparent and by communicating their decisions to the athlete.

There is one more aspect of training, which needs particular attention when putting the above recommendations into practice. Training has also an inherent 'preparation function': Athletes practise their skills with the purpose of performing them well in competition. This function of training is typically embedded in 'simulation training' which involves making training as 'real' as possible by helping athletes to train as they compete (Stratton, Cusimano, Hartman, & DeBoom, 2005). It is a common method to integrate competitive elements in (parts of) training, and this is considered a desirable approach as it gives athletes the opportunity to practise what is relevant in competition, which may make training more effective (cf. Martens, 2004). However, these competitive elements inherently include social comparison. Hence, particularly when integrating these competitive elements during training,

coaches must pay attention that athletes are rewarded on personal mastery criteria, and avoid normative - public - evaluation. This should protect task orientation and temper appraisals of a performance climate.

In competition, a task orientation is also the vital goal to promote as it may lead to positive motivational outcomes in this context, such as effort, enjoyment, effective psychological skills use and perceived performance. At the same time, an ego orientation may provide an additional source of effort and enjoyment in this context, and moreover, in a specific competitive situation (i.e., a particular contest) a temporary focus on this goal may even lead to an instant benefit on effort and performance. However, coaches should bear in mind that when athletes base their feelings of success on normative criteria this is a vulnerable source of competence as it can stand or fall by the competition outcome. Therefore, coaches should focus on promoting athletes' task orientation in this context, thereby providing athletes a reference for success that allows *all* of them to feel successful (Treasure, 2001) and afford them a solid back-up for the complementary but vulnerable sources of competence derived from an ego goal.

Coaches can promote athletes' task orientation in competition by creating a mastery climate. This climate can be created in competition by recognizing and rewarding athletes' personal performance improvement. Moreover, coaches should encourage athletes to evaluate themselves based on personal performance criteria to provide them more control over their personal achievement in competition. However, 'objective success' in competition is predominantly based on normative criteria: Therefore, athletes may experience more difficulties to identify personal criteria for success in this context. Coaches can help athletes in teaching them to identify these criteria, for example, by making the athlete aware about the factors that can influence their personal improvement in performance. This can be accomplished by encouraging the athlete to complete a post-match or race analysis to reflect

on - and self-assess - his/her own personal performance. Such routines may make athletes also (become) more realistic about their own achievements and may help them to put a win or loss in perspective.

Coaches of team-sport athletes may need to pay extra attention in applying these recommendations as the focus on the team performance may make it more difficult for team-sport athletes to identify personal criteria for success. As this may hinder a sense of personal accomplishment and/or control, it may reduce effort and enjoyment and/or increase tension. Thus, coaches in team sports should pay particular attention to rewarding their athletes on their personal progress and emphasize their individual contribution to the team.

It is also important that the process of performance improvement in competition is translated into a more concrete self-referenced feeling of success; hence, athletes need to perceive a sense of confirmation of their improvement (cf. Harwood & Hardy, 2001). This may be highly relevant, particularly in competition, because it provides athletes a self-referenced option for experiencing a sense of 'definitive' success and may temper the desire to succumb to normative success confirmation which is so strongly emphasised in this context. Moreover, this may provide task oriented athletes a more accurate perspective of their self-referenced goal striving which could enhance performance. For this objective, coaches can use a standard charting system which rates athletes' competitive achievements based on individual but objective performance criteria; for example, score a player's first service percentage in tennis, or a player's number of successful passes in football. The large(r) number of players in team sport may make it more difficult for the coach to implement these assessments. However, substitutes and/or younger athletes' parents can play an active role in completing these simple charting systems, thereby providing also team-sport athletes this valuable personal and objective performance information (cf. Harwood & Biddle, 2002).

In sum, athletes' achievement motivation may be to a certain extent specific to training and competition. In particular, the coach has an important influence in creating a climate that can optimise motivation within each context. Training and competition are different contexts: However, they should complement each other in this objective. The desire to perform well and test personal skills against other athletes in competition can be an important motivational drive for athletes to practise. In turn, the performance in competition is an important indicator for setting effective training goals; accordingly, this should facilitate further skill development in training and eventually lead to a higher performance level in competition. Throughout this continuing process of shifting between training and competition, coaches should monitor that athletes maintain a high level of self-referenced goal striving which can be accomplished by adapting the criteria for personal success to the specific relevance of each context. In this way, training and competition may reinforce each other in facilitating a motivationally effective sport experience.

Conclusion

Although achievement motivation is a widely examined construct in the sport domain, little was known regarding how it is affected by the two core sub-contexts in sport: Training and competition. Accordingly, this thesis aimed to enhance our understanding of motivational processes within and across the two contexts via adopting an AGT framework with Nicholls' (1989) concepts as the underlying theoretical basis. The findings in this thesis provide evidence that both at a dispositional and situational level, individuals may endorse context-specific goals and climate perceptions in training and competition, which may differently relate to motivational outcomes such as effort, enjoyment and tension within each context.

This work may provide a basis to extend these findings to a wider population of athletes, and to further uncover the underlying mechanisms that explain the revealed context-specific processes. Such challenges may further support the contention emerging from this

thesis that the distinction between training and competition contexts is a valuable one and should be considered when researchers investigate achievement motivation in sport. Ultimately, this may provide practitioners with further insights for optimising athletes' motivation in training and competition contexts. …thus, *yes* the context does matter!

References

Ames, C. (1992). Classrooms: Goals, structures and student motivation. *Journal of Educational Psychology, 84*, 261-271.

Baker, J., Côté, J., & Abernethy, B. (2003a). Sport-specific practice and the development of expert decision-making in team ball sports. *Journal of Applied Sport Psychology, 15,* 12–25.

Baker, J., Côté, J. & Abernethy, B. (2003b). Learning from the experts: Practice activities of expert decision-makers in sport. *Research Quarterly for Exercise and Sport, 74,* 342–347.

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.

Biddle, S. J. H., Wang, C. K. J., Kavussanu, M., & Spray, C. M. (2003). Correlates of achievement goal orientations in physical activity: A systematic review of research. *European Journal of Sport Science, 3,* 1-20. doi:10.1080/17461390300073504

Brawley, L.R., Carron, A.V., & Widmeyer, W.N. (1992). The nature of group goals in sport teams: A phenomenological analysis. *The Sport Psychologist, 6*, 323–333.

Conroy, D. E., Cassidy, C. M., & Elliot, A. J. (2008). Prospective relations between 2×2 achievement goals and the quality of sport training. *Revue Internationale de Psychologie Sociale, 21*, 109-134.

Conroy, D. E., Elliot, A. J., & Hofer, S. M. (2003). A 2 × 2 Achievement Goals Questionnaire for Sport: Evidence for factorial invariance, temporal stability, and external validity. *Journal of Sport & Exercise Psychology, 25,* 456–476.

Dale, G. A. (1996). Existential phenomenology: emphasizing the experience of the athlete in sport psychology research. *The Sport Psychologist, 10,* 307-321.

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Enquiry*, 11, 227-268.

Duda, J. L. (2001). Achievement goal 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., & Nicholls, J. G. (1992). Dimensions of achievement motivation in schoolwork and sport. *Journal of Educational Psychology, 84*, 290–299.

Dweck, C. S., & Elliott, E. S. (1983). Achievement motivation. In P. H. Mussen (Gen. Ed.) & E. M. Hetherington (Vol. Ed.), *Handbook of child psychology: Vol. IV. Social and personality development* (pp. 643–691). New York, NY: Wiley.

Elliot, A. J., & McGregor, H. A. (2001). A 2 × 2 achievement goal framework. *Journal of Personality and Social Psychology, 80,* 501-519. doi: 10.1037//0022-3514.80.3.501

Folkman, S. (1984). Personal control and coping processes: A theoretical analysis. *Journal of Personality and Social Psychology, 46,* 839-852. doi: 10.1037/0022-3514.46.4.839

Frey, M., Laguna, P. L. & Ravizza, K. (2003). Collegiate athletes' mental skill use and perceptions of success: An exploration of the practice and competition settings. *Journal of Applied Sport Psychology, 15*, 115-128.

Fryer, J. W., & Elliott, A. J. (2007). Stability and change in achievement goals. *Journal of Educational Psychology, 99*, 700-714. doi:10.1037/0022-0663.99.4.700

Green-Demers, I., Pelletier, L. G., Stewart, D. G., & Gushue, N. R. (1998). Coping with the less interesting aspects of training: Toward a model of interest and motivation enhancement in individual sports. *Basic and Applied Social Psychology*, *20,* 251–261.

Harwood, C. G. (2002). Assessing achievement goals in sport: Caveats for consultants and a case for contextualization. *Journal of Applied Sport Psychology, 14*, 106-119. doi: 10.1080/10413200252907770

Harwood, C., & Biddle, S. (2002). The Application of Achievement Goal Theory in Youth Sport. In I. Cockerill (Ed.), *Solutions in sport psychology* (pp. 58-73). London: Thomson.

Harwood, C. G., Cumming, J., & Fletcher, D. (2004). Motivational profiles and psychological skills use within elite youth sport. *Journal of Applied Sport Psychology, 16, 4*, 318–332.

Harwood, C. G., & Hardy, L. (2001). Persistence and effort in moving achievement goal research forward: A response to Treasure and colleagues. *Journal of Sport & Exercise Psychology, 23,* 330-345.

Harwood, C. G., Hardy, L., & Swain, A. (2000). Achievement goals in sport: a critique of conceptual and measurement issues. *Journal of Sport & Exercise Psychology, 22,* 235–255.

Harwood, C., Spray, C. M., & Keegan, R. (2008). Achievement goal theories in sport. In T. S. Horn (Ed.), *Advances in sport psychology* (3rd ed., pp. 157-186). Champaign, IL: Human Kinetics.

Horn, T. S. (1985). Coaches feedback and changes in children's perceptions of their physical competence. *Journal of Educational Psychology, 77,* 174–186.

Horne, T., & Carron, A. V. (1985). Compatibility in coach-athlete relationships. *Journal of Sport Psychology, 7*, 137-149.

Judd, C . M., Kenny, D. A., & McClelland, G. H. (2001). Estimating and testing mediation and moderation in within-subject designs. *Psychological Methods, 6*, 115–134.

Kavussanu, M., & Roberts, G. C. (2001). Moral functioning in sport: An achievement goal perspective. *Journal of Sport & Exercise Psychology, 23,* 37-54.

Keegan, R.J., Harwood, C.G., Spray, C.M., & Lavallee, D.E. (2009). A qualitative investigation exploring the motivational climate in early-career sports participants: Coach, parent and peer influences on sport motivation. *Psychology of Sport and Exercise*, 10, 361-372.

Lochbaum, M. R., & Roberts, G. C. (1993). Goal orientations and perceptions of the sport experience. *Journal of Sport & Exercise Psychology, 15*, 160–171.

Martens, R. (2004). Successful coaching. 3rd ed. Human Kinetics, Champaign, Ill.

McAuley, E., & Tammen, V. V. (1989). The effects of subjective and objective competitive outcomes on intrinsic motivation. *Journal of Sport & Exercise Psychology*, *11,* 84–93.

Muchinsky, P. M. (1996). The correction for attenuation. *Educational and Psychological Measurement*, *56*, 63-75.

Nicholls, J. G. (1984). Achievement motivation: Conceptions of ability, subjective experience, task choice, and performance. *Psychological Review, 91,* 328–346.

Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, Massachusetts: Harvard University Press.

Ntoumanis, N., & Biddle, S. J. H. (1998a). The relationship between competitive anxiety, achievement goals, and motivational climates. *Research Quarterly for Exercise and Sport, 69,* 176-187.

Ntoumanis, N., & Biddle, S. J. H. (1998b). The relationship of coping and its perceived effectiveness to positive and negative affect in sport. *Personality and Individual Differences*, *24*, 773-788. doi: 10.1016/S0191-8869(97)00240-7

Ntoumanis, N., & Biddle, S. (1999). A review of motivational climate in physical activity. *Journal of Sports Sciences, 17,* 643-665. doi:10.1080/026404199365678

Ommundsen, Y., & Pedersen, B. H. (1999). The role of achievement goal orientations and perceived ability upon somatic and cognitive indices of sport competition trait anxiety. *Scandinavian Journal of Medicine and Science in Sports, 9,* 333-343.

Ommundsen, Y., Roberts, G. C., Lemyre, P. N., & Treasure, D. (2003). Perceived motivational climate in male youth soccer: Relations to social-moral functioning, sportspersonship and team norm perceptions. *Psychology of Sport and Exercise, 4,* 397- 413.

Pintrich, P. R. (2000a). An achievement goal theory perspective on issues in motivation terminology, theory, and research. *Contemporary Educational Psychology*, *25*, 92-104.

Pintrich, P. R. (2000b). The role of goal orientation in self-regulated learning. In M. Boekaerts & P. R. Pintrich (Eds.), *Handbook of self-regulation* (pp. 451-502). San Diego, CA: Academic Press.

Pintrich, P. R. (2004). A conceptual framework for assessing motivation and self-regulated learning in college students. *Educational Psychology Review, 16,* 385–407.

Pintrich, P.R., Conley, A.M., & Kempler, T.M. (2003). Current issues in achievement goal theory and research. *International Journal of Educational Research, 39,* 319–337.

Preacher, K. J. & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40,* 879-891.

Roberts, G. C., Treasure, D. C., & Conroy, D. E. (2007). Understanding the dynamics of motivation in sport and physical activity: An achievement goal interpretation. In G. Tenenbaum, & R.C. Eklund (Eds), *Handbook of sport psychology* (3rd ed., pp. 3–30). Hoboken, New Jersey: Wiley & Sons.

Senko, C., & Harackiewicz, J. M. (2005). Achievement goals, task performance, and interest: Why perceived goal difficulty matters. *Personality and Social Psychology Bulletin, 31,* 1739–1753.

Stoeber, J., & Crombie, R. (2011). Achievement goals and championship performance: Predicting absolute performance and qualification success. *Psychology of Sport and Exercise, 11,* 513–521. doi:10.1016/j.psychsport.2010.07.007

Stoeber, J., Uphill, M. A., & Hotham, S. (2009). Predicting race performance in triathlon: the role of perfectionism, achievement goals, and personal goal setting. *Journal of Sport & Exercise Psychology, 31*, 211–245.

Stratton, R. K., Cusimano, K., Hartman, C., & DeBoom, N. (2005). Focus. In J. Taylor & G. Wilson (Eds.), *Applying sport psychology: Four perspectives* (pp. 51-64). Champaign IL: Human Kinetics.

Tabachnick, B. G., & Fidell, L. S. (2001). *Using multivariate statistics* (4th ed.). Boston, MA: Allyn & Bacon.

Tammen, V.V. (1998). Changes in task and ego orientations in relation to training in competitive situations. *Journal of Sport & Exercise Psychology, 20* (Suppl.), S120.

Tauer, J., & Harackiewicz, J. (1999). Winning isn't everything: Competition, achievement orientation, and intrinsic motivation. *Journal of Experimental Social Psychology, 35,* 209–238.

Tauer, J. M., & Harackiewicz, J. M. (2004). The effects of cooperation and competition on intrinsic motivation and performance. *Journal of Personality and Social Psychology, 86,* 849–861. doi: 10.1037/0022-3514.86.6.849.

Tenenbaum, G., Hall, H. K., Calcagnini, N., Lange, R., Freeman, G., & Lloyd, M. (2001). Coping with exertion and negative feedback under competitive and self-standard conditions. *Journal of Applied Social Psychology, 31,* 1582–1626.

Treasure, D. C. (2001). Enhancing young people's motivation in youth sport: An achievement goal approach. In G.C. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 79-100). Champaign, IL: Human Kinetics.

Williams, L. (1998). Contextual influences and goal perspectives among female youth sport participants. *Research Quarterly for Exercise and Sport, 69*, 47-57.

Wilson, K. M., Hardy, L., & Harwood, C. G. (2006). Investigating the relationship between achievement goals and process goals in rugby union players. *Journal of Applied Sport Psychology, 18*, 297-311.

Zimmerman, B. J. (2000). Attaining self-regulation: A social cognitive perspective. In M. Boekaerts, P. Pintrich, & M. Seidner (Eds.), *Self-regulation: Theory, research and application* (pp.13–39). Orlando, FL: Academic Press.

APPENDICES

Appendix 1 - Supplementary Analyses

1A Effects of Context on Goal Orientations with Climate as Mediator; analysis conducted on data from study two

This supplementary analysis was conducted based on a procedure described by Judd, Kenny and McClelland (2001). The difference in performance climate predicted the difference in ego orientation, indicating that performance climate mediated the effects of the context on ego orientation ($B = .16$, $t\ (407) = 3.23$, $p < .01$). However, the intercept remained significantly different from zero ($B = .26$, $t\ (407) = 7.46$, $p < .001$), indicating partial mediation.

1B Effects of Ego involvement on Performance with Effort as Mediator; analysis conducted on data from study four

Following recommendations of Preacher and Hayes (2008) a mediation analysis was conducted to test the causal relations between ego involvement, effort and performance in competition, with bootstrapping the results to address the problem of multivariate normality in relatively small samples (in this study, $N = 60$). For this purpose the SPSS macro for bootstrapping developed by Preacher and Hayes (2008) was used. The bootstrap estimates were based on 5000 bootstrap samples, the number Preacher and Hayes (2008) recommend for final reporting. This analysis was conducted controlling for gender, consistent with the other analysis in study four. Bootstrapping showed that effort mediated the effect of ego involvement on performance; point estimate of −.3.19, with a 95% CI interval of −7.3691 to −.6727.

Appendix 2 - Questionnaires

2A Questionnaire Items Used in Study One

Demographics questionnaire items

Please give us some information about yourself. Tick only one box when given the option

1. Age: _____ 2. Sex : Male □ Female □
3. Years of playing tennis competitively: _____ 4. Name of club: _____
5. Years of training with **this group:** _____ 6. Years of training with **this coach:** _____
7. Your **Current 2008** LTA Player ratings: Singles _____ Doubles _____
8. Your LTA Player ratings **one year ago:** Singles _____ Doubles _____
9. Competition level you **currently** play in tennis: International □ National □ Regional □ County □ Club □
10. Number of times per week you currently **train** with a **coach in a training group:** 1 □ 2 □ 3 □ 4 or more □
11. Number of ranking/rating matches you played **last year:** 0-5 □ 5-10 □ 10-15 □ 15-20 □ 20 or more □

Training Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, Treasure, & Balague, 1998) - Adapted

Please think about your **tennis experience** during **TRAINING** (i.e. training with a training group and a coach) and respond to the following statements **honestly** by circling the appropriate number.

During **TRAINING** I feel **most successful** when…	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I accomplish something others can't do	1	2	3	4	5
8. I reach a goal	1	2	3	4	5
9. I overcome difficulties	1	2	3	4	5
10. I master something I couldn't do before	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Test of Performance Strategies (TOPS; Thomas, Murphy, & Hardy, 1999)

Below is a list of ***strategies*** you can use in **TRAINING** (i.e. training with a training group and a coach). Please think about your tennis experience when you **train** and indicate how often you use these *strategies* by circling the appropriate number. Please respond **honestly.**

	Never	Rarely	Some times	Often	Always
1. I manage my self-talk effectively during training	1	2	3	4	5
2. My attention wanders during training	1	2	3	4	5
3. I have very specific goals for training sessions	1	2	3	4	5
4. I have trouble maintaining my concentration during long training sessions	1	2	3	4	5
5. I say things to myself to help my training performance	1	2	3	4	5
6. I set realistic but challenging goals for training sessions	1	2	3	4	5
7. During training I focus my attention effectively	1	2	3	4	5
8. I set goals to help me use training time effectively	1	2	3	4	5
9. I talk positively to myself to get the most out of training	1	2	3	4	5
10. I am able to control distracting thoughts during training	1	2	3	4	5
11. I don't set goals for training sessions, I just go out and do it	1	2	3	4	5
12. I motivate myself to train through positive self talk	1	2	3	4	5

Perceived Improvement in Training - Adapted from Balaguer, Duda, & Crespo (1999)

Please asses the ***improvement*** of your ***tennis skills*** in **TRAINING** (i.e. training with a training group and a coach) during **last year**. Please answer **honestly** by circling the appropriate number.

	About the same as one year ago		**Somewhat better than one year ago**		**Much better than one year ago**
1. Technical skills	1	2	3	4	5
2. Tactical skills	1	2	3	4	5
3. Physical skills	1	2	3	4	5
4. Mental skills	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **TRAINING** (i.e. training with a training group and a coach) and respond to the following statements by circling the appropriate number. Please respond **honestly.**

	Not at all true			**Somewhat true**			**Very true**
1. I put a lot of effort into training	1	2	3	4	5	6	7
2. I feel pressured during training	1	2	3	4	5	6	7
3. Training does not hold my attention at all	1	2	3	4	5	6	7
4. I do not feel nervous at all during training	1	2	3	4	5	6	7
5. I try very hard during training	1	2	3	4	5	6	7
6. I enjoy training very much	1	2	3	4	5	6	7
7. I am very relaxed during training	1	2	3	4	5	6	7
8. I don't put much energy into my training	1	2	3	4	5	6	7
9. I would describe training as very interesting	1	2	3	4	5	6	7
10. I am anxious during training	1	2	3	4	5	6	7
11. During training, I am thinking about how much I enjoy it	1	2	3	4	5	6	7
12. It is important to me to do well during training	1	2	3	4	5	6	7
13. I think that training is boring	1	2	3	4	5	6	7
14. I feel very tense during training	1	2	3	4	5	6	7
15. I think training is quite enjoyable	1	2	3	4	5	6	7
16. I don't try very hard to do well during training	1	2	3	4	5	6	7
17. Training is fun to do	1	2	3	4	5	6	7

Competition Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) - Adapted

Please think about your **tennis experience** during **COMPETITION** (i.e. matches that count for rating and ranking) and respond to the following statements by circling the appropriate number. Please respond **honestly.**

During **COMPETITION** I feel **most successful** when…	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I accomplish something others can't do	1	2	3	4	5
8. I reach a goal	1	2	3	4	5
9. I overcome difficulties	1	2	3	4	5
10. I master something I couldn't do before	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Test of Performance Strategies (TOPS; Thomas, et al., 1999)

Below is a list of ***strategies*** you can use during **COMPETITION** (i.e. matches that count for rating and ranking). Please think about your tennis experience when you play a *match* and indicate how often you use these *strategies* by circling the appropriate number. Please respond **honestly.**

	Never	Rarely	Some times	Often	Always
1. I talk positively to myself to get the most out of competitions	1	2	3	4	5
2. During competition I focus my attention effectively	1	2	3	4	5
3. I set personal performance goals for a competition	1	2	3	4	5
4. I have specific cuewords or phrases that I say to myself to help my performance during competition	1	2	3	4	5
5. I set very specific goals for competition	1	2	3	4	5
6. I am able to control distracting thoughts during competition	1	2	3	4	5
7. I evaluate whether I achieve my competition goals	1	2	3	4	5
8. I say things to myself to help my competitive performance	1	2	3	4	5
9. I have trouble maintaining my concentration during long matches	1	2	3	4	5
10. I manage my self-talk effectively during competition	1	2	3	4	5
11. During competition I set specific result goals for myself	1	2	3	4	5
12. My attention wanders during competition	1	2	3	4	5

Perceived Performance in Competition - Adapted from Balaguer et al. (1999)

Please asses your own ***performance*** in **COMPETITION** (i.e. matches that count for rating and ranking) during **last year**. Please answer **honestly** by circling the relevant number.

	Poor	**Fair**	**Good**	**Very Good**	**Excellent**
1. Technical skills	1	2	3	4	5
2. Tactical skills	1	2	3	4	5
3. Physical skills	1	2	3	4	5
4. Mental skills	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **COMPETITION** (=matches that count for rating and ranking) and respond to the following statements by circling the relevant number. Please respond **honestly**

	Not at all true			**Somewhat true**			**Very true**
1. I try very hard during competition	1	2	3	4	5	6	7
2. I enjoy competition very much	1	2	3	4	5	6	7
3. I do not feel nervous at all during competition	1	2	3	4	5	6	7
4. I don't put much energy into competition	1	2	3	4	5	6	7
5. I think that competition is boring	1	2	3	4	5	6	7
6. I feel pressured during competition	1	2	3	4	5	6	7
7. I think competition is quite enjoyable	1	2	3	4	5	6	7
8. Competition does not hold my attention at all	1	2	3	4	5	6	7
9. I don't try very hard to do well during competition	1	2	3	4	5	6	7
10. I feel very tense during competition	1	2	3	4	5	6	7
11. I would describe competition as very interesting	1	2	3	4	5	6	7
12. During competition, I am thinking about how much I enjoy it	1	2	3	4	5	6	7
13. I put a lot of effort into competition	1	2	3	4	5	6	7
14. Competing is fun to do	1	2	3	4	5	6	7
15. I am very relaxed during competition	1	2	3	4	5	6	7
16. It is important to me to do well during competition	1	2	3	4	5	6	7
17. I am anxious during competition	1	2	3	4	5	6	7

2B Questionnaire Items Used in Study Two

Demographics questionnaire items

Please give us some information about yourself. Tick only one box when given the option

1. Age: _____ 2. Sex : Male □ Female □
3. Name of current club: _____
4. Years of competitive football experience: _____
5. Years of training with *this team:* _____ 6. Years of training with *this coach:* _____
7. Number of times per week you train this *season* with your coach: 1 □ 2 □ 3 □ 4 or more □
8. Number of competition matches you played *this season:* 0 - 5 □ 5-10 □ 10-15 □ 15-20 □ 20 or more □
9. Your current competition level: Club □ County □ Regional □ National □ International □

Training Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) -Adapted

Please think about your sport experience during **TRAINING**, which means **training with a coach**, and respond to the following statements **honestly** by circling the appropriate number.

*During **TRAINING** I feel **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I reach a goal	1	2	3	4	5
8. I overcome difficulties	1	2	3	4	5
9. I reach personal goals	1	2	3	4	5
10. I win	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, Duda, & Yin, 2000) - Adapted

Here are some statements about how your current coach is like in **TRAINING.** Please read each one and **circle the number that is most correct.** If there was more than one coach on your team, the questions are about the coach that you spend most of your time with.

*On this team, during **TRAINING the coach** …*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. Emphasizes that all of us are crucial to the success of the team.	1	2	3	4	5
2. Gives most of his or her attention to the stars.	1	2	3	4	5
3. Rewards trying hard.	1	2	3	4	5
4. Praises players only when they outplay team-mates.	1	2	3	4	5
5. Encourages players to help each other.	1	2	3	4	5
6. Makes it clear who he or she thinks are the best players.	1	2	3	4	5
7. Emphasizes always trying your best.	1	2	3	4	5
8. Notices only the top players.	1	2	3	4	5
9. Encourages players to improve.	1	2	3	4	5
10. Favours some players more than others.	1	2	3	4	5
11. Encourages players to work on their weaknesses.	1	2	3	4	5
12. Yells at players for messing up.	1	2	3	4	5
13. Makes sure players improve on skills they're not good at.	1	2	3	4	5
14. Takes players out of training matches for mistakes	1	2	3	4	5
15. Wants us to try new skills	1	2	3	4	5
16. Gets mad when a player makes a mistake.	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **TRAINING** and respond to the following statements by circling the relevant number. Please respond **honestly.**

	Not at all true						**Very true**
1. I try very hard during training	1	2	3	4	5	6	7
2. I do not feel nervous at all during training	1	2	3	4	5	6	7
3. I enjoy training very much	1	2	3	4	5	6	7
4. I put a lot of effort into training	1	2	3	4	5	6	7
5. Training is fun to do	1	2	3	4	5	6	7
6. I am very relaxed during training	1	2	3	4	5	6	7
7. I don't put much energy into training	1	2	3	4	5	6	7
8. I am anxious during training	1	2	3	4	5	6	7
9. I think training is quite enjoyable	1	2	3	4	5	6	7
10. It is important to me to do well during training	1	2	3	4	5	6	7
11. I feel pressured during training	1	2	3	4	5	6	7
12. I don't try very hard to do well during training	1	2	3	4	5	6	7
13. I feel very tense during training	1	2	3	4	5	6	7
14. During, training I am thinking about how much I enjoy it	1	2	3	4	5	6	7

Competition Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) -Adapted

Please think about your sport experience during **COMPETITION** and respond to the following statements by circling the appropriate number. Please respond **honestly.**

*During **COMPETITION** I feel **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I reach a goal	1	2	3	4	5
8. I overcome difficulties	1	2	3	4	5
9. I reach personal goals	1	2	3	4	5
10. I win	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Perceived Motivational Climate in Sport Questionnaire-2 (PMCSQ-2; Newton, et al., 2000) - Adapted

Here are some statements about how your current coach is like in **COMPETITION.** Please read each one and **circle the number that is most correct.** If there was more than one coach on your team, the questions are about the coach that you spend most of your time with.

*On this team, during **COMPETITION the coach** …*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. Emphasizes that all of us are crucial to the success of the team.	1	2	3	4	5
2. Gives most of his or her attention to the stars.	1	2	3	4	5
3. Rewards trying hard.	1	2	3	4	5
4. Praises players only when they outplay team-mates.	1	2	3	4	5
5. Encourages players to help each other.	1	2	3	4	5
6. Makes it clear who he or she thinks are the best players.	1	2	3	4	5
7. Emphasizes always trying your best.	1	2	3	4	5
8. Notices only the top players.	1	2	3	4	5
9. Encourages players to improve.	1	2	3	4	5
10. Favours some players more than others.	1	2	3	4	5
11. Encourages players to work on their weaknesses.	1	2	3	4	5
12. Yells at players for messing up.	1	2	3	4	5
13. Makes sure players improve on skills they're not good at.	1	2	3	4	5
14. Takes players out of a match for mistakes	1	2	3	4	5
15. Wants us to try new skills	1	2	3	4	5
16. Gets mad when a player makes a mistake.	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **COMPETITION** and respond to the following statements by circling the relevant number. Please respond **honestly.**

	Not at all true						**Very true**
1. I try very hard during competition	1	2	3	4	5	6	7
2. I do not feel nervous at all during competition	1	2	3	4	5	6	7
3. I enjoy competition very much	1	2	3	4	5	6	7
4. I put a lot of effort into competition	1	2	3	4	5	6	7
5. Competing is fun to do	1	2	3	4	5	6	7
6. I am very relaxed during competition	1	2	3	4	5	6	7
7. I don't put much energy into competition	1	2	3	4	5	6	7
8. I am anxious during competition	1	2	3	4	5	6	7
9. I think competition is quite enjoyable	1	2	3	4	5	6	7
10. It is important to me to do well during competition	1	2	3	4	5	6	7
11. I feel pressured during competition	1	2	3	4	5	6	7
12. I don't try very hard to do well during competition	1	2	3	4	5	6	7
13. I feel very tense during competition	1	2	3	4	5	6	7
14. During competition, I am thinking about how much I enjoy it	1	2	3	4	5	6	7

2C Questionnaire Items Used in Study Three

Demographics questionnaire items

1. Age: _____ 2. Sex : Male □ Female □
3. Your sport: _____ 4. Years of competitive experience in this sport: ___
The next two questions are about your coach. If there is more than one coach on your Team, the questions are about the coach that you spend most of your time with. 5. Number of ***training*** sessions you received coaching from ***this coach*** **this season** so far: 1-5 □ 5-10 □ 10-15 □ 20 or more □ 5. Did you receive coaching from ***this coach*** during ***competition*** **this season**? Yes □ No □ ***If yes***, how many games/races did you receive coaching? 1-5 □ 5-10 □ 10-15 □ 20 or more □
7. In which *team* do you play: 1st □ 2nd□ 3rd □ 4th □ other: ___
8. In which *league* do you play: Premier □ Midlands 1 □ Midlands 2 □ Midlands 3 □ Midlands 4 □ other: ___
9. Number of times per week you train *this season* with your coach: 1 □ 2 □ 3 □ 4 or more □
10. Number of competitive matches/races in which you participated *this season* so far*:* 1-5 □ 5-10 □ 10-15 □ 15-20 □ 20 or more □

Training Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) - Adapted

Please think about your sport experience during **TRAINING** and respond to the following statements **honestly** by circling the appropriate number.

*During **TRAINING** I feel **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I master something I could not do before	1	2	3	4	5
8. I overcome difficulties	1	2	3	4	5
9. I reach personal goals	1	2	3	4	5
10. I win	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Sport Anxiety Scale-2 (SAS-2; Smith, Smoll, Cumming, & Grossbard, 2006).

Please think about how you USUALLY feel *during* **TRAINING** and respond to the following statements by circling the relevant number. Please respond **honestly.**

*During **TRAINING**….*	**Not at all**	**Some-what**	**Mode-rately**	**Very much**	**Extreme ly**
1. My body feels tense	1	2	3	4	5
2. I worry that I will not perform well	1	2	3	4	5
3. I worry that I will let others down	1	2	3	4	5
4. I feel tense in my stomach	1	2	3	4	5
5. I worry that I will not perform at my best	1	2	3	4	5
6. I worry that I will perform badly	1	2	3	4	5
7. My muscles feel shaky	1	2	3	4	5
8. I worry that I will mess up	1	2	3	4	5
9. My stomach feels upset	1	2	3	4	5
10. My muscles feel tight because I am nervous	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **TRAINING** and respond to the following statements by circling the relevant number. Please respond **honestly.**

	Not at all true			**Somewhat true**			**Very true**
1. Training does not hold my attention at all	1	2	3	4	5	6	7
2. I enjoy training very much	1	2	3	4	5	6	7
3. I would describe training as very interesting	1	2	3	4	5	6	7
4. I think training is quite enjoyable	1	2	3	4	5	6	7
5. I think that training is boring	1	2	3	4	5	6	7

	Not at all true			**Somewhat true**			**Very true**
1. I try very hard during training	1	2	3	4	5	6	7
2. I don't put much energy into training	1	2	3	4	5	6	7
3. It is important to me to do well during training	1	2	3	4	5	6	7
4. I don't try very hard to do well during training	1	2	3	4	5	6	7
5. I put a lot of effort into training	1	2	3	4	5	6	7

Competition Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) -Adapted

*During **COMPETITION** I feel **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I am clearly superior	1	2	3	4	5
3. I am the best	1	2	3	4	5
4. I work hard	1	2	3	4	5
5. I show clear personal improvement	1	2	3	4	5
6. I outperform my opponents	1	2	3	4	5
7. I master something I could not do before	1	2	3	4	5
8. I overcome difficulties	1	2	3	4	5
9. I reach personal goals	1	2	3	4	5
10. I win	1	2	3	4	5
11. I show other people I am the best	1	2	3	4	5
12. I perform to the best of my ability	1	2	3	4	5

Sport Anxiety Scale-2 (SAS-2; Smith, et al., 2006)

Please think about how you USUALLY feel *during* **COMPETITION** and respond to the following statements by circling the relevant number. Please respond **honestly.**

*During **COMPETITION**….*	**Not at all**	**Some-what**	**Mode-rately**	**Very much**	**Extremely**
1. My body feels tense	1	2	3	4	5
2. I worry that I will not perform well	1	2	3	4	5
3. I worry that I will let others down	1	2	3	4	5
4. I feel tense in my stomach	1	2	3	4	5
5. I worry that I will not perform at my best	1	2	3	4	5
6. I worry that I will perform badly	1	2	3	4	5
7. My muscles feel shaky	1	2	3	4	5
8. I worry that I will mess up	1	2	3	4	5
9. My stomach feels upset	1	2	3	4	5
10. My muscles feel tight because I am nervous	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviours*** during **COMPETITION** and respond to the following statements by circling the relevant number. Please respond **honestly.**

	Not at all true						**Very true**
1. Competition does not hold my attention at all	1	2	3	4	5	6	7
2. I enjoy competition very much	1	2	3	4	5	6	7
3. I would describe competition as very interesting	1	2	3	4	5	6	7
4. I think competition is quite enjoyable	1	2	3	4	5	6	7
5. I think that competition is boring	1	2	3	4	5	6	7

	Not at all true						**Very true**
1. I try very hard during competition	1	2	3	4	5	6	7
2. I don't put much energy into competition	1	2	3	4	5	6	7
3. It is important to me to do well during competition	1	2	3	4	5	6	7
4. I don't try very hard to do well during competition	1	2	3	4	5	6	7
5. I put a lot of effort into competition	1	2	3	4	5	6	7

2D Questionnaire Items Used in Study Four

Demographics questionnaire items

A. Please give us some information about yourself.

1. Name:_____	**2.** Age: _____
3. Sex: Male □ Female □	**4.** Are you right handed? Yes □ No □
5. Do you participate in any sport? Yes □ No □	
6. If yes, what is your main sport: _____	
7. For how many years have you participated competitively in this sport? ____	
8. Do you have golf - or mini golf - experience? Yes □ No □	
If yes, did you play more than 3 rounds of golf - or mini golf - per year? Yes □ No □	
or, have you received more than 3 sessions of formal coaching in golf - or mini golf? Yes □ No □	

Training Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) - Adapted

Please think about **the TRAINING** in which you just participated and respond **honestly** to the following statements by circling the appropriate number.

*During the previous **TRAINING** I felt **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I was clearly superior	1	2	3	4	5
3. I was the best	1	2	3	4	5
4. I worked hard	1	2	3	4	5
5. I showed clear personal improvement	1	2	3	4	5
6. I outperformed my opponent	1	2	3	4	5
7. I reached a goal	1	2	3	4	5
8. I did master something I could not do before	1	2	3	4	5
9. I reached personal goals	1	2	3	4	5
10. I won	1	2	3	4	5
11. I showed other people I am the best	1	2	3	4	5
12. I performed to the best of my ability	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviors*** during **the TRAINING** in which you just participated and respond **honestly** to the following statements.

	Not at all true						**Very true**
1. The training did *not* hold my attention at all	1	2	3	4	5	6	7
2. I tried very hard during the training	1	2	3	4	5	6	7
3. I did *not* feel nervous at all during the training	1	2	3	4	5	6	7
4. I enjoyed the training very much	1	2	3	4	5	6	7
5. I did *not* put much energy into the training	1	2	3	4	5	6	7
6. I would describe the training as very interesting	1	2	3	4	5	6	7
7. I was very relaxed during the training	1	2	3	4	5	6	7
8. It was important to me to do well during the training	1	2	3	4	5	6	7
9. I think that the training was boring	1	2	3	4	5	6	7
10. I did *not* try very hard during the training	1	2	3	4	5	6	7
11. I was anxious during the training	1	2	3	4	5	6	7
12. I think the training was quite enjoyable	1	2	3	4	5	6	7
13. I did put a lot of effort into the training	1	2	3	4	5	6	7
14. I felt very tense during the training	1	2	3	4	5	6	7
15. During the training I was thinking about how much I enjoy it	1	2	3	4	5	6	7

Manipulation check

Please think about the **TRAINING** in which you just participated and indicate what the ***purpose of the training*** was. Please respond honestly.

*The **PURPOSE** of the **TRAINING** was for me/us to….*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. Learn a skill	1	2	3	4	5
2. Outperform another	1	2	3	4	5
3. Improve a skill	1	2	3	4	5
4. Beat another	1	2	3	4	5

Competition Questionnaire Items

Perception of Success Questionnaire (POSQ; Roberts, et al., 1998) - Adapted

Please think about the **COMPETITION** in which you just participated and respond **honestly** to the following statements by circling the appropriate number.

*During the previous **COMPETITION** I felt **most successful** when…*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. I beat other people	1	2	3	4	5
2. I was clearly superior	1	2	3	4	5
3. I was the best	1	2	3	4	5
4. I worked hard	1	2	3	4	5
5. I showed clear personal improvement	1	2	3	4	5
6. I outperformed my opponent	1	2	3	4	5
7. I reached a goal	1	2	3	4	5
8. I did master something I could not do before	1	2	3	4	5
9. I reached personal goals	1	2	3	4	5
10. I won	1	2	3	4	5
11. I showed other people I am the best	1	2	3	4	5
12. I performed to the best of my ability	1	2	3	4	5

Intrinsic Motivation Inventory (IMI; Ryan, 1982) - Adapted

Please think about your ***feelings and behaviors*** during the **COMPETITION** in which you just participated and respond **honestly** to the following statements.

	Not at all true			**Somewhat true**			**Very true**
1. This competition did *not* hold my attention at all	1	2	3	4	5	6	7
2. I tried very hard during this competition	1	2	3	4	5	6	7
3. I did *not* feel nervous at all during this competition	1	2	3	4	5	6	7
4. I enjoyed this competition very much	1	2	3	4	5	6	7
5. I did *not* put much energy into this competition	1	2	3	4	5	6	7
6. I would describe this competition as very interesting	1	2	3	4	5	6	7
7. I was very relaxed during this competition	1	2	3	4	5	6	7
8. It was important to me to do well during this competition	1	2	3	4	5	6	7
9. I think that this competition was boring	1	2	3	4	5	6	7
10. I did *not* try very hard during this competition	1	2	3	4	5	6	7
11. I was anxious during this competition	1	2	3	4	5	6	7
12. I think this competition was quite enjoyable	1	2	3	4	5	6	7
13. I did put a lot of effort into this competition	1	2	3	4	5	6	7
14. I felt very tense during this competition	1	2	3	4	5	6	7
15. During this competition I was thinking about how much I enjoy it	1	2	3	4	5	6	7

Manipulation check

Please think about the **COMPETITION** in which you just participated and indicate what the ***purpose of the competition*** was. Please respond honestly.

*The **PURPOSE** of the **COMPETITION** was for me/us to….*	**Strongly Disagree**	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**
1. Learn a skill	1	2	3	4	5
2. Outperform another	1	2	3	4	5
3. Improve a skill	1	2	3	4	5
4. Beat another	1	2	3	4	5