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**An integrated model of achievement goals and self-regulated action:
Identifying domain, cultural and temporal effects**

by

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Abstract

Introduction. The main purpose of this thesis was to investigate the fit between four achievement goals, personal goal attributes and self-regulation strategies, and the generalisation of goal-strategy patterns to (1) different life domains (academic and physical activity settings), (2) two cultures (individualistic/the UK and collectivistic/Romania) and (3) over time, in two contexts (academic and sport university settings) in the UK. Additionally, differences between high level English and Romanian athletes in self-construals (individualism versus collectivism), achievement goals and self-regulation processes was investigated in one study.

Method. The participants in the four studies of this thesis were: English university students (N = 591; study 1), English university athletes and exercise participants (N = 294 and N = 288, respectively; study 2), English and Romanian elite/sub-elite athletes (N = 91, N = 109 respectively; study 3a), Romanian university students involved in sport at elite and sub-elite levels (N = 196; study 3b), and English university student-athletes (N = 295; study 4). Three main questionnaires were used: the Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) (studies 1, 3b, and 4) and the Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot & Hofer, 2003) (studies 2, 3ab and 4) measured four achievement goals in academic and sport settings, respectively (mastery-approach, mastery-avoidance, performance-approach and performance-avoidance goals); the third questionnaire, the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) (all studies) required participants to state their most important personal goal, and measured two goal attributes (efficacy and value) and five self-regulation strategies used during goal pursuit (planning, self-monitoring, social comparison, self-reward and self-criticism). The fourth questionnaire, was the Self-Construal Scale-Revised (SCS-R; Hardin, 2006) which measured individualistic and collectivistic self-definitions in study 3a. Studies 1, 2 and 3a and 3b employed a correlational design, structural equation modelling analyses, and multivariate and univariate analyses of covariance (study 3a only), while study 4 employed a longitudinal design, latent growth curve analyses and structural equation modelling.

Studies 1 and 2 Results. The goal-strategy models identified in education (study 1), sport and exercise (study 2) in the UK were very similar to each other, and consisted of both positive and negative paths (see figure A overleaf). Furthermore, in study 1, the total sample was divided into two samples according to the difficulty and specificity of personal goals: students in sample 1 (N = 325) set easy and vague goals, while students in sample 2 (N = 266) set difficult and specific goals. The model found in the total sample was tested again simultaneously in these two samples in order to ascertain the potential moderation effects of goal difficulty and specificity. As the model was invariant across groups it was concluded that personal goal difficulty/specificity was not a moderator of achievement goal relations with self-regulation processes. Finally, in study 2 Map relations with planning/self-monitoring was

fully and partially mediated by goal efficacy and value in the sport and exercise domains, respectively.

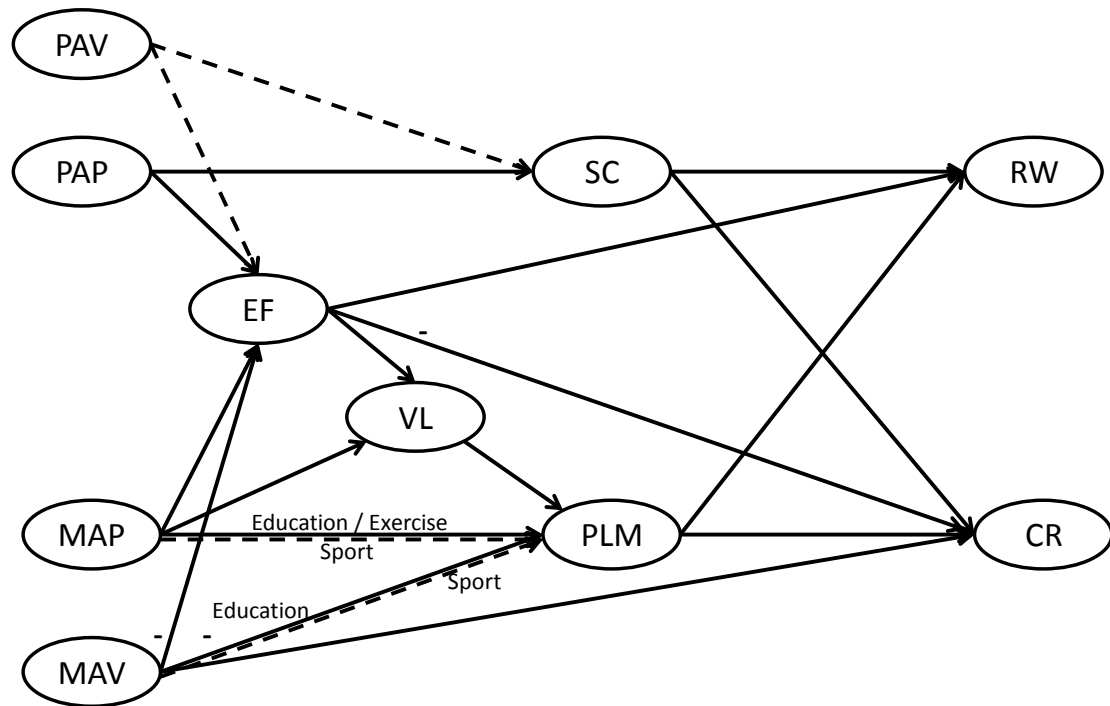


Figure A. The goal-strategy models in education, sport and exercise settings (dashed line - non significant paths) (PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning/Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

Study 3a and 3b Results. In study 3a, Romanian athletes had higher collectivistic self-construals than English athletes, while the two groups were similar in individualism. After controlling for collectivism, Romanian athletes, regardless of sport type (individual or team sport) had higher scores than English athletes on Pap and Pav goals, social comparison and self-motivation strategies (self-reward and self-criticism); and Romanian team sport athletes had higher scores on Map and planning/self-monitoring than their English counterparts.

In study 3b the goal-strategy models identified in moderately competitive academic and physical activity settings in an individualistic West European culture (UK) were tested in highly competitive academic and elite sport settings in a collectivistic East European culture (Romania). The academic and sport domain models identified in Romania were similar to each other, and to those found in the UK. The following differences in model paths were noted in Romania: in the academic domain, four paths were not significant (Map and Mav to efficacy, efficacy to self-reward, and social comparison to self-criticism); and a new negative path was identified, from Map to social comparison; in the sport domain, five paths were not

significant (Mav to efficacy, Pap to efficacy and social comparison, efficacy to reward and social comparison to self-criticism) and three new paths emerged, two positive paths, Pav to social comparison, and efficacy to planning/self-monitoring, and one negative path from efficacy to criticism. The positive path from Pav to social comparison (found in highly competitive sport settings) represents the most notable difference between the UK and Romanian models.

Study 4 Results. The goal-strategy models identified in academic and sport contexts in studies 1 and 2 (described earlier) emerged again in these settings in study 4 (minus the path from efficacy to reward in both settings, and efficacy to criticism in academia) at three measurement times (start, middle and end of academic year/competitive season). Therefore, the model was stable over time. Unconditional growth curve analyses showed that, during one year, achievement goals and self-regulation processes followed different patterns of change: Map and Pav goals declined, while Pap and Mav goals were stable in education, and all goals declined in sport settings; goal commitment (a composite measure of goal efficacy and value) declined and planning/self-monitoring remained stable (in both settings); social comparison and self-motivation (a composite measure of self-reward and self-criticism) increased in education, while in sport the former was stable and the latter declined. Finally, associative growth curve models showed that in both domains: 1) temporal changes in Map were positively related to changes in goal commitment and planning/monitoring, and changes in the latter were associated with changes in self-motivation; 2) changes in Pap, social comparison and self-motivation were positively related; and 3) Mav changes were not related to changes in SR processes.

Conclusion. This thesis advocates a conceptualisation of achievement goals as a dynamic, cyclical interplay between situated reasons, standards and self-regulated action; 2) an exploration of goal standards dimensions beyond the mastery-performance focus with the reason-standard complex; and 3) an expanded achievement motivation and self-regulation model, including the why (achievement goals), the what (personal goals/goal setting), and the how (self-regulated action), where the focus of enquiry is sifted from the correlates to the mechanisms of achievement goal effects.

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**An integrated model of achievement goals and self-regulated action:
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CHAPTER 1. Introduction and Literature Review

For the past three decades achievement goals have received considerable attention in the study of motivation (Kaplan & Maehr, 2007; Roberts, Abrahamsen, & Lemyre, 2009). Achievement goals define an integrated pattern of beliefs, attributions and affect that underpins different approach and avoidance strategies, different levels of engagement, and different responses to achievement outcomes (Kaplan & Maehr, 2002). The experiences associated with these goals are held to be qualitatively different (Ames, 1992; Dweck, 1999; Dweck & Leggett, 1988): a mastery goal orients individuals towards the development of potential, a focus on personal improvement, learning and mastery of the task, the value of effort and strategies in the quest for personal excellence; a performance goal orients individuals towards demonstrating a superior ability, winning or outperforming others, and the strategic use of effort.

Research findings have generally supported the notion that mastery and performance goals have a different pattern of cognitive, affective and achievement processes and outcomes. Several reviews concluded that the two goals were associated with a divergent set of outcomes – positive for mastery goals and negative for performance goals (Elliot, 2005; Roberts et al., 2009). However, a closer examination of this body of research showed that performance goals can have both positive and negative consequences, and the latter may depend on personal and environmental characteristics (Harackiewicz et al., 2002; Kaplan & Middleton, 2002; Midgley, Kaplan & Middleton, 2001). In the late 1990s, the approach-avoidance distinction was introduced in the achievement goals literature (e.g. Elliot & Church, 1997) partly as a way of explaining the mixed findings related to performance goals. This development generated a lot of research activity in education, but less so in the physical activity domain (Wang, Biddle & Elliot, 2007). A literature review pertaining to sport and physical education settings reported that performance-approach goals continue to generate mixed outcomes even when

separated from performance-avoidance goals (Papaioannou, Zourbanos, Krommidas & Ampatzoglou, 2012).

Theory and research on self-regulated academic learning addressed the question of how students become masters of their own learning processes. Pintrich (2000a) defined self-regulated learning as ‘an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of the environment’ (p. 453). A number of motivational beliefs have been linked to the process of self-regulation, and a number of motivational regulation strategies have been identified (e.g. Wolters, Pintrich, & Karabenick, 2005). Yet this body of research has been less integrated into models of self-regulated learning (Boekaerts, 1997, 1999; Zimmerman, 2000). An integration of the cognitive and motivational components of self-regulation into comprehensive models would provide researchers, educators and policy makers with a better conceptual map for understanding the potential and limitations of learners and learning environments (Boekaerts, 1999; 2010).

A good deal is known about the ‘whys’ or energising factors of behaviour, but not enough about how motivation is maintained (Wolters, Benzion & Arroyo-Giner, 2011). Many learning tasks extend over time and individuals’ motivation is expected to ebb and flow as competing alternative activities appear along the way. Hence, an important question is what people do to maintain their motivation. Achievement goal theories focus on how motivation fluctuates as a function of personal and situational goals, but there is little focus on how to control or intentionally regulate motivation; in contrast, self-regulation models focus on how individuals come to purposefully control their own motivation, cognition and behaviour (Pintrich, 2000a; 2004). Therefore, motivation and self-regulation are intimately linked and an integration of achievement goal theory and self-regulation models would be beneficial to both areas of enquiry (Fryer & Elliot, 2008). The need for competence at the centre of achievement motivation provides the energy which instigates or activates competence-oriented behaviour; this motivational energy is channelled through goals towards specific self-regulation processes

and outcomes that satisfy the need for competence (Elliot & Church, 1997; 2002; Elliot & Dweck, 2005).

Most empirical research to date have treated motivation and self-regulation as distinct theoretical constructs that are related quantitatively – higher levels of motivation would lead to a greater use of self-regulation (Kaplan & Maehr, 2002). However, early conceptualisations of achievement goals involved both the purpose for engagement and the actions that promote that purpose (e.g. Maehr, 1984; Nicholls, 1989). From this perspective, mastery and performance goals are associated with different self-regulation strategies (qualitative relationship) rather than with higher or lower levels of self-regulation. Pintrich (2000b) suggested that students with mastery and performance goals may set different objectives, monitor different types of cues and use different regulation strategies.

Contemporary motivation research tends to emphasize the distinctiveness of students' motivational orientations across different domains. Motivation is often viewed as domain specific (Bandura, 1997; Eccles, 2005; Roberts et al., 2009). For example, individuals' achievement goals, self-efficacy, and value may vary in education, sport and exercise domains. Self-regulation has also been portrayed as a domain specific process as it depends on contextual opportunities for choice and control (Wolters & Pintrich, 1998). According to social-cognitive theories of motivation and self-regulation models the effects of motivation on self-regulation are moderated by environmental affordances and impedances, therefore patterns of interrelations among motivational constructs and self-regulation processes observed in one domain (e.g. education) may or may not emerge in another (e.g. sport or exercise). Moreover, most theories of motivation and self-regulation in education and physical activity settings were developed in Western industrialised nations particularly the US and Northern Europe (Biddle, Wang, Kavussanu, & Spray, 2003; Kaplan & Maehr, 2002) and reflect core values deeply embedded in these cultures. The transfer of these theories to other cultures with a different value system can make their application, analysis and practical outcomes problematic.

Achievement goals activate or set in motion several SR processes such as: goal setting and planning, monitoring and evaluation of goal progress, self-motivation strategies and finally reflections and reactions to goal progress (Pintrich, 2000a). The latter may lead to a revision or change of achievement goals. Several factors could prompt goal changes: additional information about the task (e.g. difficulty level) and environment (e.g. tough competition) (Bong, 2005), performance feedback (Senko & Harackiewicz, 2005b), perceived competence changes (Muis & Edwards, 2009), and life events outside of the achievement domain. Specifically, difficult tasks, tough competition, negative feedback and low perceived competence may lead to an increase in avoidance goals and decrease in approach goals. There has been little longitudinal research on achievement goals (Fryer & Elliot, 2007), and even less on the temporal dynamics of achievement goal effects (Shim, Ryan & Cassady, 2012). Thus our understanding of how achievement goals change and the implication of these changes for self-regulation processes is incomplete.

Drawing on the limitations of achievement goals and self-regulation literatures, this thesis investigated the effects of approach and avoidance achievement goals on a range of self-regulation strategies (i.e. planning, self and social monitoring/evaluation and self-motivation) in two domains (academic and physical activity), two cultures (individualistic and collectivistic) and over time (one year).

1.1. Achievement Motivation

Achievement motivation may be construed as the energization and direction of competence relevant behaviour (Elliot, 1997). Competence is a psychological nutrient necessary for optimal human functioning (Ryan, 1995), it is an inherent psychological need which served an evolutionary role of helping people develop and adapt to their environment (Deci & Ryan, 1990). Individuals experience competence and incompetence as pleasant and unpleasant respectively, and according to the hedonic principle (Higgins, 1997) all human beings are motivated to approach pleasure (to feel competent) and avoid pain (to avoid feeling incompetent).

1.1.1. The Classic Achievement Motivation Theory: Two Achievement Motives

Need Achievement Theory (Atkinson, 1957; McClelland, Atkinson, Clark & Lowell, 1953) was the predominant achievement motivation theory until the beginning of 1970s. According to this theory, achievement behaviour is energised by the interaction between two dispositional motives – the need for achievement and fear of failure (i.e. the capacity to experience pride in success and shame in failure respectively), and two contextual factors – the incentive value and probability of success or failure. Each motive interacts with the two corresponding contextual factors to determine two antagonistic behavioural tendencies – towards success, and away from failure. When one tendency is stronger than the other motivated behaviour is approach or avoidance oriented. Therefore, Need Achievement Theory explains two broad categories of adaptive and maladaptive behavioural tendencies or high and low achievement. High achievers are individuals high in the need for achievement, who feel drawn to achievement settings (due to anticipated success and pride), seek and value optimal challenges, exert effort in pursuit of success, persist in the face of setbacks and generally perform well relative to their ability and stage of development. Low achievers are individuals with a high fear of failure who find achievement settings aversive (because of anticipated failure and shame/embarrassment) and, if escape or ‘passive avoidance’ (Gray, 1987) is prevented by contextual constraints, they engage in ‘active avoidance’ of failure by selecting too easy or difficult challenges, reduce effort and give up easily after setbacks; these face-saving behaviours are intended to gain easy success, or to provide other explanations for failure than lack of ability (e.g. task difficulty). As a result, low achievers underperform given their capabilities, preparation and support received.

1.1.2. The Original Achievement Goals Theory: Two Achievement Goals

During the 1980s and 1990s Achievement Goal Theory researchers (AGT; Ames, 1992; Dweck, 1986, 1999; Nicholls, 1984, 1989) conceptualised goals as interpretative lens which influence how individuals think, feel, and act while engaged in achievement settings. They proposed two major goals based on the definition of competence underpinning success/failure or subjective goal attainment: task/mastery goals with a focus on meeting the demands of the

task and developing one's competence (i.e. task-/self-referenced definition of competence); and ego/performance goals with a focus on demonstrating superior competence in comparison with relevant others and /or normative standards (particularly with less effort); therefore, this goal heightens awareness of the self and preoccupations with the adequacy of the self (Duda, 2005; Dweck, 1999; Kaplan & Maehr, 1999). The mastery and performance goal labels will be used throughout this thesis.

According to AGT, perceived competence moderates the effects of performance goals only. Achievement behaviour is *adaptive* (selection of challenging goals, exerting effort and persistence) when individuals adopt mastery goals regardless of competence perceptions, and/or when they adopt performance goals but only when perceived competence is high. On the other hand, achievement behaviour is *maladaptive* (e.g. avoiding challenging tasks, exerting little effort, reducing persistence in the face of difficulty) when individuals focus on performance goals and have low perceived competence (i.e. have doubts about their ability to outperform others).

1.1.3. The Contemporary Achievement Goals Theory: Four and Six Achievement Goals

In the 1990s and early 2000s, the classic approach/avoidance distinction (the valence of competence) was integrated into the performance/mastery goal framework (the definition of competence) and resulted first in a three goal model (Elliot & Church, 1997; Elliot & Harackiewicz, 1996) in which performance goals were partitioned into approach (seeking to demonstrate normative competence) and avoidance (avoiding demonstrating normative incompetence); then in a four goal framework (Elliot & McGregor, 2001) when mastery goals were also separated into approach (seeking to develop competence in relation to task and self standards) and avoidance (avoiding stagnation or loss of competence in relation to task and self standards); and finally, a six goal model (Elliot, Murayama & Pekrun, 2011) articulated goals in relation to standards of competence evaluation and separated mastery goals into a task-based goal (focus on the absolute demands of the task), and self-based goal (focus on intrapersonal standards, personal progress in relation to self in the past or in the future) and other-based goals (focus on interpersonal standards or comparison with others).

The Four Goal Conceptualisation. Integrating several definitions provided by Elliot and colleagues, goals are conceptualised as cognitive-dynamic representations of positive and negative competence-relevant future objects or possibilities that one is committed to approach or avoid (e.g. Elliot, 1997; 1999; Elliot & Fryer, 2008; Elliot & Thrash, 2001). A goal is a *cognitive representation* (which implies the utilisation of a mental apparatus in the process of regulation) of a *future-oriented object* (the focal point of regulation is something possible in the future; objects may be concrete/abstract, physical/psychological, observable/unobservable and of an ‘infinite variety of content’), *approach or avoidance valenced* (moving towards or away from present or abstract objects/possibilities); the final and essential goal feature is *commitment*; without which there are no goals, there are only wishes, fantasies, incentives or goal candidates (Elliot & Fryer, 2008).

Thus, achievement motivation, more specifically approach / avoidance motivation, is ‘the energisation of behaviour by, or the direction of behaviour toward positive / away from negative stimuli (objects, events, possibilities), where concrete or abstract stimuli represent ‘an essentially limitless, idiographic array of focal points’ (Elliot, 2006, p. 113). This movement towards or away from positive or negative possibilities takes two distinguishable forms: promoting new positive situations and maintaining existing ones; and preventing new negative possibilities and escaping from or rectifying existing negative situations.

The Two versus Four Goal Conceptualisation. It is important to note two significant differences in the conceptualisation of goals in the dichotomous and the four goal frameworks, one related to the nature or composition of the mastery-performance distinction, the other to the level of generality (Elliot et al., 2011). Firstly, the goals in the four goal model were defined only in terms of task/intrapersonal and interpersonal standards of competence, while in the dichotomous model these standards were sometimes included in the goal definition (in addition to other dimensions) but often they were not (Hulleman, Schragar, Bodmann & Harackiewicz, 2010). Secondly, the early goal orientations incorporated a domain general, super-ordinate reason-aim combination in their conceptualisation, serving both energisation and directional functions. In contrast, in the four goal model, the goal construct is defined as

situational *aim only*, separate from the dispositional reason or purpose, serving only a directional function, with energisation being provided by global motives (Elliot, 2006).

The Four versus Six Goal Conceptualisation. Recently, Elliot et al. (2011) introduced the six goal framework as simply a split of the mastery goal into task- and self-related standards with no changes to the conceptualisation of goals as situational aims separate from reason. However, further in their article an interesting conceptual U-turn took place. Elliot et al. (2011) classified the four goal and earlier dichotomous models as *development-demonstration models*, with the former being ‘the most advanced manifestation of these models’ (p. 643). This inclusion of the four goal model in the same class with earlier models at a stroke retracts the earlier goal definition as low-level aim and repositions it as a higher-level reason: ‘from the developmental-demonstration standpoint a goal is an underlying reason for behaviour or a superordinate or a higher level purpose [...]. In the standard approach the goal is construed as the concrete aim used to guide behaviour as opposed to the underlying reason of behaviour’ (p. 643). The authors go on to state that ‘the two approaches diverge in their conceptual definition of goal [and] converge in distinguishing between high-level reasons and low-level aims’ (p. 643). Therefore, a clear distinction was made between concrete low-level aims or *standards* (in the six goal model) and abstract high level aims or *reasons* (of the four goal model).

Elliot’s situational ‘aim or standard only’ goal conceptualisation, separate from the dispositional reason or purpose, brings achievement goals close to the target goal concept in the goal setting literature (also defined as aim or standard) as noted recently by Papaioannou and colleagues (Papaioannou, Zourbanos, Krommidas, & Ampatzoglou, 2012). Elliot has not addressed explicitly the integration of achievement goal and target or personal goal constructs, but there is an implied equivalence between the ‘standard’ *achievement goal* and target or *personal goal* concepts when he acknowledged the importance of goal dimensions (typically investigated in the goal setting literature) to the way achievement goals are represented and pursued: ‘goals vary on many dimensions that have little to do with competence per se, such as level of abstraction, time frame, and individual versus group focus’ (Elliot et al., 2011, p. 642).

In conclusion, based on recent developments, it seems reasonable to distinguish the achievement goal concept in terms of super-ordinate high-level *reasons* or broad abstract aims relevant across life domains (e.g. academic, sport, exercise), and concrete *standards* used to evaluate the attainment of broad aims or reasons. *In this thesis achievement goals and personal goals represent abstract reasons and concrete standards respectively relevant in a life domain.*

1.1.4. The Hierarchical Model of Approach and Avoidance Motivation

The Hierarchical Model (Elliot & Church, 1997; Elliot, 2006) starts from the core premise that the approach and avoidance distinction is fundamental to optimal functioning, and therefore provides an important lens for understanding the structure and function of self-regulation. Moreover, the goal construct is the conceptual centrepiece of the model because goal striving is a cardinal characteristic of human behaviour (McDougal, 1908). Finally, the model proposes that achievement goals have different antecedents and consequences.

Antecedents of Goal Adoption

Goals are not sufficient to account for motivated behaviour, it is also necessary to consider the motivational sources underlying goals: dispositional motives, competence perceptions and valuation, cognitive-based and neurophysiological dispositions, and environmental factors (Elliot, 1999). Resulting from the original integration of approach-avoidance and mastery-performance distinctions, the two motives (the need for success and the fear of failure) were the first antecedents to receive attention (e.g. Elliot, 1997). Motives provide the affective energy (the why of action) which was channelled into goals, and was directed through them into the self-regulation processes and outcomes of goal striving. Mastery-approach (Map) and performance-avoidance goals (Pav) are ‘pure’ or congruent forms of regulation, as they serve a single motive (need for achievement and fear of failure respectively); performance-approach (Pap) and mastery-avoidance (Mav) goals are more complex forms of regulation as they can serve either motives (i.e. approach motive when probability for success is high or when the

task is perceived as challenging; and avoidance motive when probability for failure is high or when the task is perceived as a threat), or both motives (when the probability of success is moderate, there are equal chances to succeed or fail, when the task is perceived as both challenging and threatening). These predictions have been confirmed in both education and physical activity settings (Conroy, Elliot & Hoffer, 2003; Elliot & McGregor, 2001; Ommundsen, 2003; Spray, Biddle, Chatzisarantis & Warburton, 2006).

Competence expectations and competence valuation have also been posited as antecedents of goals in the hierarchical model; these concepts are reminiscent of the probability and incentive value of success/failure from the classic need achievement theory. High and low competence expectations orient individuals towards approach and avoidance goals respectively (e.g. Elliot, 1997; 1999); while high competence valuation should orient individuals towards both approach and avoidance goals (Elliot & McGregor, 2001). There is some empirical evidence in both education and physical activity domains supporting these predictions (e.g. Greene, Miller, Crowson, Duke, & Akay, 2004; Liem, Lau, & Nie, 2008; Nien & Duda, 2008).

In addition to the variables derived from the classic achievement motivation theory, cognitive and biological dispositions were also presumed to exert an influence on goal adoption (Elliot, 1999). Some intra-psychic sources of motivation include cognitive-based dispositions acquired through socialisation processes and accumulated experience such as: implicit theories of ability (i.e. an incremental belief that ability is malleable and can be developed through effort; and an entity belief of ability as fixed, innate capacity); self-based, and relationally-based variables (e.g. self-esteem, self-worth, self-validation, need for approval and affiliation, fear of rejection, attachment styles) (e.g. Elliot & Thrash, 2002). For example, entity and incremental beliefs about ability (proposed originally by Dweck, 1986) lead to performance or mastery goals respectively; and self/relational variables are likely to determine performance goals due to self-presentation concerns and interpersonal orientations inherent in these goals (e.g. Elliot & McGregor, 2001). Other intra-psychic personal sources of goal adoption are neurophysiological, partly 'hard wired' predispositions towards negative and positive stimuli, such as behavioural activation / inhibition systems, approach / avoidance temperaments, and extraversion / introversion (e.g. Elliot & Thrash, 2002).

Environmental affordances and impedances can also influence goal adoption both directly and indirectly: when powerful enough contextual characteristics can overwhelm personal disposition and establish goal preferences; and/or contextual structures can influence the degree to which different motives and ability beliefs are activated and which goal will be served by them (Elliot, 1999). There is evidence in both education and physical activity domains supporting these predictions (e.g. Church, Elliot & Gable, 2001; Conroy, Kaye & Coatsworth, 2006; Lau & Nie, 2008; Murayama & Elliot, 2009; Roberts, Treasure, & Conroy, 2007).

Goal Complexes

The multitude of possible antecedents of achievement goals highlights the complexity of goal adoption and goal regulation. The view of goals and underlying motivational tendencies as conceptually separate, but hierarchically linked goal complexes (Elliot & Thrash, 2001; Thrash & Elliot, 2001) brings into bold relief the flexibility of self-regulation: the same goal may lead to different regulatory processes across situations depending on the underlying motivations they serve (Elliot, 1997; 1999). In the actual process of regulation, motivational foundations remain closely intertwined with goals and exert their influence throughout the process of goal pursuit (Elliot, 2006).

In the original formulation, goal complexes were defined as [aim] *in order to* [underlying reason/motive] such as approaching success (aim) in order to avoid incompetence (competence motive) (Elliot, 1999). However, based on their conceptualisation of goals as standards, Elliot and colleagues (2011) recommended that ‘a good starting place for thinking about goal complexes is the intersection of the development-demonstration and standard approaches’ (p. 463). In other words, goal complexes may also take the form of [standard/ the ‘what’] *used in the service of* [aim or reason/ the ‘why’]; hence standards provide the concrete means for measuring the attainment of abstract aims or reasons. For example, by ‘answering correctly a lot of questions in this exam’ (standard), ‘I will get a better grade than others / I will know I mastered or understood thoroughly the course material/ I avoid doing poorly in

this course' (reasons). *In this thesis, the reason – standard complex provides the framework for exploring the relations between achievement goals (as reasons) and some dimensions of personal goals (as standards).*

Consequences of Goal Adoption

In the hierarchal model, different motive-aim goal complexes are posited to lead to different processes and outcomes even when the goal is the same (Elliot, 2006). Therefore, the model predicts clear and distinct pattern of consequences for each goal based on their motivational antecedents. Map and Pav goals are expected to produce a consistent pattern of positive and negative outcomes respectively; Pap and Mav goals are expected to produce a more variable and complex pattern of positive and negative outcomes depending on whether the focus of these goals and their motivational foundations are congruent or incongruent respectively. These predictions have been supported in both education and sport settings: Map has an overwhelmingly positive, optimal, network of outcomes, Pav has negative, dysfunctional effects, while Pap and Mav are neither entirely optimal nor entirely dysfunctional, with Pap appearing to be more optimal than Mav (Fryer & Elliot 2008; Roberts et al., 2007). The existing pattern of data suggests that the optimal goal profile may be a simultaneous adoption of approach goals coupled with the absence of avoidance goals. *The optimal pattern of achievement goals for adaptive self-regulation processes is the focus of this thesis, and a review of relevant self-regulation literature is provided in section two of this chapter.*

1.1.5. Controversial Issues in the Achievement Goals Literature

Achievement Goals and Goals Setting: Goal Type, Difficulty and Commitment

Recommendations for the integration of goal setting and goal orientations literatures have been made by researchers in both areas (e.g. Kozlowski & Bell, 2006; Roberts & Kristiansen, 2012). For example, Kozlowski and Bell (2006) stated that 'a theoretical integration of the goal-setting and achievement goal orientations and a disentangling of their distinct effects are needed' (p. 900). However, important differences between the goal concepts used in the

achievement goal and goal setting literatures have prevented the integration of these related literatures (Elliot & Fryer, 2008).

Conceptually, achievement goals are dispositions or inclinations to adopt *two* conceptions of competence as terminal purposes or ultimate reasons for engaging in action: the *mastery* conception – to develop or improve competence in relation to task- or self-related standards of success, and the *performance* conception – to demonstrate or prove one's competence in relation to others (Dweck, 1986; Nicholls, 1989). The 'improve or prove ability' as standards of success are abstract and vague (Locke & Latham, 2007). Additionally, achievement goals provide the cognitive-affective mindset behind the intention to act, the initial action, and the reaction to progress feedback during task engagement. This mindset consists of: 1) beliefs about the fixed/malleable nature, importance and existing level of ability, the value of effort and persistence, and causes of success/failure; 2) expected or likely affect – seeking positive affect or avoiding negative affect, optimism/pessimism about or confidence in the probability of success, satisfaction or dissatisfaction with progress; and 3) likely behaviours – selecting concrete standards of performance in terms of difficulty/specificity, effort expenditure and persistence, and adjusting level of goal difficulty and effort following progress feedback (Dweck, 1992; Roberts, Abrahamsen, & Lemyre, 2009).

On the other hand, in the goal setting literature, goals are states, the adoption of concrete standards for evaluating performance; the content of these concrete standards can be classified in terms of type (performance outcome/product or learning/process strategies), specificity (vague or specific) and difficulty (easy or challenging), temporal proximity (long or short term) (Burton, Naylor, & Holliday, 2001). Furthermore, in this literature, goals are set in relation to straightforward tasks for which participants already have the ability to perform, and only effort and persistence (i.e. motivation) are required for success; conversely, in the achievement goal literature the tasks are complex, ongoing and usually long-term (Locke & Latham, 2007).

In the goal setting literature, goal effectiveness depends on a number of goal dimensions or attributes such as type, difficulty, specificity, time frame, and, most importantly, commitment

(Lock & Latham, 2002). Almost ten years ago, it was noted that achievement goal researchers 'seldom, if ever, take into account findings from goal setting theory' (Seijts, Latham, Tasa, & Latham, 2004, p. 227). Recently, however, Elliot and colleagues (2011) acknowledged the relevance of goal dimensions to the way achievement goals are represented and pursued. Next, the intersection of the achievement goal and goal setting literatures is explored in relation to three goal dimensions: type, difficulty/specificity and commitment (efficacy/value); additionally, issues related to these dimensions in the achievement goal literature are highlighted.

Personal Goal Types: The Phenomenological Reality of Avoidance and Comparative Goals

The recent achievement goal conceptualisation as three standards of competence (Elliot et al., 2011) is similar to the goal types found in the goal setting literature, however, the labels used in the two literatures are confusing: mastery/task standards = process goals (components of overall performance or processes instrumental to overall performance improvement); mastery/self standard = performance goal (i.e. self-referenced overall performance outcome) and performance/inter-individual standards = outcome goals (Burton & Weiss, 2008; Lock & Latham, 2002; Roberts & Kristiansen, 2012).

Since the partition of achievement goals into approach and avoidance types, the phenomenological reality of avoidance goals has been questioned, mainly in education and to a lesser extent in sport settings. Some researchers have argued that students and athletes view approach and avoidance goals as being the same (Ciani & Sheldon, 2010; Kaplan et al., 2009; Urdan & Mestas, 2006). Others have argued that researchers overestimate the natural occurrence of avoidance goals in some settings such as academic and physical education classes (e.g. Horowitz, 2010; Okun, Fairhome, Karoly, Ruehlman, & Newton, 2006; Sideridis & Mouratidis, 2008). Supporting evidence showed that when students are explicitly prompted to set approach and avoidance goals, the prevalence of avoidance goals was under 30%; and when not prompted, the frequency dropped to under 10% (Elliot & Sheldon, 1997; Elliot, Sheldon & Church 1997; Schnelle, Brandstatter & Knopfel, 2010). Additionally, when students were asked to describe their goals in their own words they did not generate performance goals that included elements of peer comparison and competition (e.g. Horowitz,

2010; Okun et al., 2006; Urdan, 2001). These findings led some to question the external validity or phenomenological reality of achievement goals measured through questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006).

Personal Goal Difficulty and Specificity as Moderators of Achievement Goal Influences

According to the goal setting theory (Lock & Latham, 1990), specific and difficult goals improve performance when commitment to the goal is high. Differences between achievement goals on difficulty and specificity have been acknowledged by early theorists. For example, Dweck and Elliot (1983) proposed that mastery goals have more flexible and vague standards of success than performance goals, making them easier to attain: 'performance standards often have an all-or-nothing quality; if children fall short of their standards, they may well perceive themselves as having missed the boat. In contrast, for learning goals, partial attainment may have considerable value. That is, even if children fail to reach the standard they have set they may still be pleased with their increased skills or knowledge' (p. 656). Similarly, Nicholls (1979) argued that due to the different standards for success used, everyone can be successful with mastery goals, but only the most talented can be successful with performance goals. The difference in difficulty perceptions between mastery and performance goals was experimentally tested and confirmed by Senko and Harackiewicz (2005a). Moreover there is some empirical evidence that the combined attributes of goal difficulty and specificity (labelled 'goal difficulty') mediate or moderate the effects of achievement goals on outcomes such as performance and task interest (Lee, Sheldon & Turban, 2003; Roney & O'Connor, 2008; Seijts et al., 2004; Senko & Harackiewicz, 2005a; Vande Walle, Cron & Slocum, 2001). Specifically, two experimental studies showed that goal difficulty moderated the relations between achievement goals and students' performance in complex tasks (computer-based simulations or word game) (Seijts et al., 2004; Senko & Harackiewicz, 2005a).

Personal Goal Commitment: Goal Efficacy and Value as Mediators of Achievement Goals

Commitment to personal goals is a pivotal, yet underexplored component of goal setting and goal regulation processes (Burton & Weiss, 2008; Kirschenbaum, 1987). Individuals are committed to their goals when they perceive them to be important and attainable (Locke,

1996; Wigfield, Tonks & Eccles, 2004), therefore, *goal value and goal efficacy* are important determinants of goal pursuit efforts. In the achievement goal literature, there are disagreements over the role of perceived competence/efficacy as an antecedent of goal adoption or moderator of goal outcomes. In the hierarchical model, perceived competence is placed as an antecedent of goals and some evidence exist to support this assertion (Elliot & McGregor, 2001). On the other hand, in the dichotomous achievement goal theory (Dweck, 1986; Nicholls, 1989) perceived competence is assumed to moderate the effects of performance goals in that adaptive strivings result only when individuals have high levels of competence.

Minimal research has been conducted on the moderator/mediator hypothesis in both education and physical activity settings (Biddle, Wang, Kavussanu & Spray, 2003; Elliot, 2005); the moderating effects reported across studies were mixed (Coutinho & Neuman, 2008; Cury, Biddle, Sarrazin & Famose, 1997; Elliot, Da Fonseca & Moller, 2006; Standage, Duda & Ndtumanis, 2003; Whitehead, Andree & Lee, 2004) while the mediation effects were reported consistently (Biddle, Soos, & Chatz, 1999; Li, Shen, Rukavina & Sun, 2011; Lintunen, Valkonen, Leskinen, & Biddle, 1999; Sproule, Wang, Morgan, McNeal & McMorris, 2007). Moreover, some studies actually found an interaction between Map (not Pap) and self-efficacy (e.g. Bouffard, Bouchard, Goulet, Denoncourt & Couture, 2005; Kaplan & Midgley, 1997). These mixed and unexpected findings on the role of perceived competence could be due to a failure to take into account the importance or value students attach to their goals (Bouffard et al., 2005; Harackiewicz & Sansone, 1991; Hulleman, Durik, Schweigert & Harackiewicz, 2008).

The concept of value, or the importance an individual places on the pursuit of competence, is an underexplored area of contemporary achievement theory (Elliot, 1997). Although in the original achievement motivation theory (Atkinson, 1957; McClelland et al., 1953), value was a moderator (together with perceived competence) of behaviour tendencies emanating from motives, it was not addressed in the achievement goal theory (Dweck, 1986, 1999; Nicholls, 1989), while in the hierarchical model (Elliot, 1999) value appears as an antecedent of all goals.

A few studies in education and physical activity settings identified value (competence valuation) as a mediator of goal effects (Cury, Elliot, Sarrazin, Da Fonseca & Rufo, 2002; Cury, Fonseca, Dufo, Peres & Sarrazin, 2003; Elliot et al., 2006), and Bouffard et al. (2005) even argued that ‘a better understanding of the interplay between achievement goals and self-efficacy beliefs could be achieved by distinguishing goals according to their importance or significance for the person’ (p. 382). Moreover, others suggested that competence valuation may sometimes have more effect on task engagement than perceived competence – i.e. despite self-doubts individuals may be willing to make significant efforts when the outcome is important to them (Bouffard, Bois, Veseau, & Laurach, 1995; Harackiewicz & Sansone, 1991). In conclusion, goal value, or competence valuation is still an underdeveloped area of achievement goal theory as noted by Elliot over fifteen years ago (Elliot, 1997) and the role of perceived competence as a moderator/mediator of achievement goals is still generally ignored in the academic and sport literatures (e.g. Biddle et al., 2003; Elliot, 2005; Kingston, Harwood & Spray, 2006).

Reason-Standard Goal Complex: Integrating Achievement Goals and Goal Setting Paradigms

The reason-standard goal complex recommended by Elliot and colleagues (2011) constitutes an ideal framework for integrating the achievement goal and goal setting paradigms.

However, the standards measure offered by Elliot et al. is not adequate for this purpose due to its narrow focus on one type of task – exam taking, learning for assessment only, and four goal contents. This narrow conceptualisation of goal standards contradicts: 1) theorising of goals as object representations of an ‘infinite variety of content’ (Elliot & Fryer, 2008, p) or of a ‘limitless idiographic array of focal points’ (Elliot, 2006, p. 113); 2) research findings showing that individuals with mastery goals are more concerned with personally interesting material regardless of its relevance to exams (Senko & Miles, 2008); and 3) qualitative research findings on the natural occurrence of personal goal types. Therefore, it is proposed here that a qualitative measure of individuals’ authentic self-set goals would capture more accurately the phenomenology of goal contents in terms of type or focus.

Similar to the original motive-reason complex (Elliot, 1999) within the reason-standard complex the two constructs are separate but hierarchically linked, with concrete standards (personal goals) being more proximal determinants of behaviour than reasons (dispositional achievement goals). Therefore, the effects of achievement goals may be mediated or moderated by personal goals attributes. Secondly, the hierarchical link between the standard used in the service of reason, brings into focus the flexibility of self-regulation: the same standard may serve different reasons. This feature of the reason-standard complex may shed some light on the inconsistencies between the quantitative (reason) and qualitative (standard) research in relation to avoidance and comparative goal foci. Standards may be mainly approach in nature (e.g. ‘getting grades over 60%’) because they can serve approach as well as avoidance reasons (e.g. Pav ‘not being worse than others with grades in the 60s’ and Mav ‘avoiding an insufficient mastery of course material’). Moreover, standards related to performance outcomes such as grades in academia and personal bests in sport may not be explicitly comparative in nature (i.e. wanting to be better than others) but can be used in the service of Pap or Pav (i.e. as indicators of one’s standing in a hierarchy of peers, either above or not below a specific desired level).

In the context of the hierarchical model of achievement motivation, this thesis aimed to provide an insight into the achievement goal – personal goal complex; specifically, the role played by personal goal attributes such as difficulty/specificity (study 1), efficacy and value in the effects of achievement goals on self-regulation processes (all four studies) and the nature of personal goals contents (studies 1, 2 and 3) in terms of type or focus.

The Competitive Nature of the Environment as a Moderator of Achievement Goal Influences

Relatively little is known about environmental factors as moderators of achievement goals effects (e.g. Murayama & Elliot, 2009; Roberts, Treasure & Kavussanu, 1997). The role of environmental influences on goal adoption and regulation are inherently complex, partly because individuals bring personal perceptual preferences to achievement situations (Elliot & Moller, 2003). Even the most capable students and athletes experience failure at some point

depending on their personal level of aspiration and/or the expectations placed on them by significant others (Eccles, 1993; Ryan, Sheldon, Kasser & Deci, 1996). However, what matters most for optimal regulation is the way individuals define failure experiences as an opportunity for learning and development or as challenges to their sense of self-worth, and opportunities to experience shame or embarrassment (Fryer & Elliot, 2008).

The environmental structures can play an important role in swaying individuals towards a view of mistakes and failure as a tool for learning, or as indicators of incompetence and inferiority through cues about the probability and incentive value of success/failure (Elliot & Moller, 2003). Achievement contexts are by very nature normative structures, however they vary dramatically in terms of how many succeed relative to how many fail. From an *objective contextual* standpoint, all normative structures require that some individuals be more successful than others. Nevertheless, in some structures very few succeed (curve grading, high level sport) while in others many or nearly all succeed (criterion and pass/fail grading; low level sport, and exercise settings).

Therefore, in this thesis achievement goal effects are examined in five contexts which vary in the objective probability of success/failure (i.e. how many succeed relative to how many fail) and the incentive value of success (i.e. the presence or absence of financial rewards) as follows: 1) a non-competitive exercise setting, where success is self-referenced and all can succeed; 2) two sport contexts – university (low) level sport, a moderately competitive domain where many can succeed due to a broad definition of normative success (i.e. winning, starter status, valued member of team); and elite/sub-elite (high) level sport, a highly competitive domain with a narrow definition of success, where few can succeed and enjoy substantial financial rewards; 3) two university academic contexts, both low-to-moderate competitive domains with two interconnected standards of success – an easy standard (pass/fail) and a moderately difficult standard (high/good versus average/low grades based on criterion grading), where many or most can succeed; one academic contexts is explicitly competitive as financial rewards are available to the top 50% of students while the other is implicitly competitive as no rewards are attached to academic performance.

This thesis offers an insight into the extent to which the adoption of personal goals and the effects of achievement goals are moderated by the objective probability of success or competitiveness/challenge inherent in different environments: a moderately competitive academic domain without financial incentives (study 1), a non-competitive and a moderately competitive physical activity domain (i.e. exercise and low level sport; study 2), a moderately competitive academic domain and a highly competitive physical activity domain, both with financial incentives (study 3).

The Cultural Background as a Moderator of Achievement Goal Influences

Despite early writings on achievement goals being rooted in cross-cultural psychology (Maehr & Nicholls, 1980), the vast majority of goal research in education and sport psychology has been conducted in Western cultures (Biddle et al., 2003; Heckhausen, 1991). Maehr and Nicholls (1980) argued that goals may operate differently for members of collectivistic and individualistic cultures. Performance goals (also referred to as ego or ego-social goals; Nicholls, Patashnick, & Nolen, 1985) involve a self-conscious concern with appearing able or avoiding appearing less able than others, while mastery goals refer to a relatively selfless absorption in the task (Maehr & Kaplan, 2000).

Different cultural perspectives are presumed to promote different motivational processes. An individualistic emphasis on standing out fosters a bias towards positive information and a focus on distinguishing oneself from others in a positive manner; in contrast, the collectivistic emphasis on fitting in fosters a bias towards negative information and a focus on avoiding relational discord or group disruption by eliminating negative characteristics (Heine, Lehman, Markus & Kitayama, 1999; Markus, Kitayama, Heiman, 1996). Therefore, individualistic and collectivistic cultures should promote approach and avoidance goals respectively. On the other hand, the cultural implications for the adoption of mastery and performance goals are not clear cut: individualism should foster competitive values, but an analysis of the World Value Survey did not support this relationship (Hayward & Kemmelemeier, 2007); and collectivism may facilitate mastery goals, due to an emphasis on social interaction, cooperation and

harmony (e.g. Butler & Ruzani, 1993), and performance goals, due to an emphasis on social approval, social comparison and social hierarchy (e.g. Klassen, 2004) .

Still, in today's global environment dividing nations into individualistic and collectivistic is no longer realistic as not all of their members fit the stereotype (Singelis & Brown, 1995). There is evidence that the independent and interdependent views of the self appear to coexist within every individual regardless of culture, and when activated alter psychological and behavioural outcomes (e.g. Brewer & Gardner, 1996; Gardner, Gabriel & Lee, 1999). Therefore, an integration of cultural background and self-construals was recommended for a more nuanced understanding of cultural effects (Kaplan & Maehr, 2007; Zusho, 2008). *Study 3 had two aims: to investigate cultural differences between elite/sub-elite athletes in achievement goals and self-regulation processes while controlling for individual variability in self-construals (study 3a); and to investigate the moderating role of culture in the relations between achievement goals and self-regulation processes in two domains (education and sport)(study 3b).*

Temporal Goal Regulation: The Cyclical Nature of Goal Endorsement

Little consensus exists in the achievement goal literature on whether goals should be conceptualised as aims only, aim or reason combined or overarching orientations (Elliot, 2005; Urdan & Mestas, 2006), and research using these different definitions continues to coexist. The level of goals' generality has important implications for their temporal stability: dispositional goal orientations describe relatively stable individual differences while the more recent conceptualisation as cognitive-dynamic aims or standards is more situationally specific and temporally unstable. In order to avoid ambiguity, it is important to specify the generality level of the achievement goal conceptualisation adopted in research in general (Spray & Keegan, 2005) and in studies of temporal stability in particular.

According to AGT, goals should be stable as they are predicted by relatively stable characteristics of the individual (e.g. motives; Elliot & Church, 1997; temperaments; Elliot & Thrash, 2002; theory of intelligence; Dweck & Leggett, 1988) and the environment (e.g.

evaluation structure, the style of instruction and the frequency of evaluation; Ames, 1992; Epstein, 1989; Urdan & Turner, 2005).

Also, goals are important components of the cyclical regulation process in achievement strivings, therefore goal changes can be expected. Several factors could prompt such changes: additional information about the task (e.g. difficulty level) and environment (e.g. tough competition) (Bong, 2005), performance feedback (Senko & Harackiewicz, 2005b), perceived competence changes (Muis & Edwards, 2009), and life events outside of the achievement domain. Secondly, according to the hierarchical model of achievement goals, change is more likely to occur in goals with purely positive or negative antecedents – Map and Pav goals respectively, while goals with mixed antecedents – Pap and Mav goals are more likely to be stable (Elliot, 2005; Elliot & Church, 1997).

Despite these arguments, not much attention has been directed to the nature and implications of achievement goal changes or the temporal dynamics of goal relations (Fryer & Elliot, 2008; Shim, Ryan & Cassady, 2012). The sparse evidence in academia shows that changes in approach goals were related to changes in self-efficacy, perceived competence, self-esteem, self-worth and academic performance (Jagacinski, Kumar, Boe, Lam & Miller, 2010; Meece & Miller, 2001; O’Keefe, Ben-Eliyahu & Linnenbrink-Garcia, 2013; Paulick, Watermann, & Nuckles, 2013; Shim, Ryan, & Anderson, 2008; Shim, Ryan & Cassady, 2012). Additionally, there is some evidence that achievement goal effects on self-esteem, contingency of self-worth and academic performance were stable over three measurement waves during one year (O’Keefe et al., 2013; Paulick et al., 2013; Shim et al., 2012). *Therefore, study 4 aimed to address the temporal dynamics of achievement goals, self-regulation and their relations over one year.*

Conclusion

In conclusion, from an achievement goal perspective, this thesis aimed to investigate the self-regulation activity instigated by approach and avoidance achievement goals, the role played by personal goal characteristics (goal efficacy, value, difficulty/specificity) in these relations,

and three types of moderators – the objective level of contextual challenge (in a range of academic and physical activity domains), the cultural background (individualistic vs. collectivistic) and time (temporal changes over one year).

1.2. Self-Regulation

1.2.1. Traditions in Self-Regulated Learning Research

Self-regulated learning (SRL) refers to forms of learning that are metacognitively guided and strategic (Winne, 1997; Zimmerman, 1990). Metacognition is ‘the awareness learners have about their general academic strengths and weaknesses, cognitive resources they can apply to meet the demands of the task, and their knowledge about how to regulate engagement in task to optimize leaning processes and outcomes’ (Winne & Perry, 2000, p. 533). Strategic learning describes the way in which learners deal with challenging tasks by choosing from their repertoire the strategies best suited to the situation, and by applying them appropriately (Zimmerman, 1990).

SRL as an explanatory construct of successful learning has both advantages and disadvantages. SRL allows researchers to describe the components of successful academic learning, to explain the interactions between and among the different components, and to relate learning and achievement directly to the self (i.e. to a person’s goal structure, motivation and emotion) (Boekaerts, 1997, 1999). The problem with such a complex construct is that it draws from widely different research traditions with different conceptualization of SRL, different terms and labels for similar facets of the construct (Boekaerts, 1999; Boekaerts, Pintrich, & Zeidner, 2000).

Three schools of thought have informed the understanding of SRL – research on learning styles, metacognition, and goal-directed behaviour (Boekaerts, 1999). Learning styles refer to typical ways students learn or process information such as deep or surface (Marton & Soljo, 1984) and holistic or linear / serial processing (Pask, 1988). Metacognitive theory defines successful learning as the employment of metacognitive skills in the service of directing one’s

learning. Various metacognitive skills have been identified including orienting, planning, executing, monitoring, evaluating and correcting (Brown, 1987; Weinstein & Mayer, 1986).

Learning and instructional programmes based on these traditions aim to develop environments that cater to students' existing cognitive and metacognitive styles. The problem with this approach is that a student's current preferred style reflects personally or culturally valued characteristics, not because these styles are more adaptive, but because the student has not yet experienced the benefits of other possibilities in a systematic way (Boekaerts, 1998, 1999). By treating cognitive and metacognitive styles as dispositions, these traditions overlook important hallmarks of SRL, namely the perceptions of choice, accessibility and adaptability (Winne & Perry, 2000). Furthermore, these research traditions are limited to the 'how' of learning and are missing an important point, the 'why' of learning – why students are prepared to do what they do, and why they are or are not prepared to do what is expected of them (Boekaerts, 1999).

Students' ability to define their learning activities in light of their wishes, needs and expectations, and their ability to protect their own goals from conflicting and distracting alternatives is another essential hallmark of SRL (Boekaerts & Niemivirta, 2000). Students may have the cognitive and metacognitive knowledge and skills but they may not be willing to invest the necessary resources to regulate their learning (Rheinberg, Vollmeyer & Rollett, 2000; Ryan, 1991). Students may not put in the time and effort required by deep cognitive and metacognitive strategies for several reasons: they may have a maladaptive motivational profile (e.g. Pintrich, 2000b); they may not have in their repertoire the necessary motivational regulation skills (e.g. Wolters, 2003); they may be unable to prioritize multiple conflicting goals (e.g. Boekaerts, 1998); or the environment may not satisfy their needs for autonomy, competence and relatedness (e.g. Boekaerts & Minnaert, 1999; Deci & Ryan, 1985).

A number of motivational beliefs have been linked to the process of self-regulation (e.g. Pintrich, Marx & Boyle, 1993; Pintrich & Schrauben, 1992); also, more recently a number of motivational regulation strategies have been identified (e.g. Wolters, 1998). Yet this body of research has been less integrated into models of SRL (Boekaerts, 1997, 1999; Pintrich,

Wolters & Baxter, 2000; Zimmerman, 2000). Boekaerts (1997, 1999) argued that an integration of the cognitive and motivational aspects of SR in a comprehensive model of SRL would provide researchers, educators and policy makers with a better conceptual map for understanding the potential and limitations of learners and learning environments.

1.2.2. An Integrative Framework of Self-Regulated Learning

There are many models of SRL that propose different constructs and different conceptualisations (e.g. Boekaerts & Niemvierta, 2000; Butler & Winne, 1995; Pintrich, Wolters, & Baxter, 2000; Schunk, 1994; Zimmerman, 1989, 1998, 2000). However, these models share four basic assumptions (Pintrich, 2000a): 1) learners are active, constructive participants in their own learning process; 2) learners potentially monitor, control and regulate certain aspects of their cognition, motivation, behaviour and some features of the environment; 3) there is some type of standard or goal against which comparisons are made; and 4) self-regulatory activities are mediators between personal and contextual characteristics and actual achievement or performance. Reflecting the shared assumptions of these models, Pintrich (2000a) proposed a useful working definition of self-regulated learning as ‘an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of the environment’ (p. 453).

The integrative framework proposed by Pintrich (2000a) consists of four phases and four areas of regulation (see table 1). Phase 1 involves goal-setting, planning and activation of perceptions and knowledge about the task, context and self (e.g. goal orientations, self-efficacy, value of the task). Phase 2 includes monitoring processes that represent meta-cognitive awareness of different aspects of the self, task or context. Phase 3 involves efforts to control and regulate different aspects of the self or task and context. Finally, phase 4 represents various types of reactions and reflections on the self and the task or context (e.g. self-evaluation, attributions, affect). Pintrich noted that the phases represent a general time-ordered sequence that individuals would go through as they perform a task (as in Zimmerman’s cyclical models); however he emphasised that there is no strong assumption

Table 1.1. Phases and areas of self-regulated learning (from Pintrich, 2000a)

Phases	Cognition	Areas of regulation		
		Motivation/Affect	Behaviour	Context
Forethought, planning and activation	Target goal setting	Goal orientation adoption	[Time and effort planning]	[Perceptions of task]
	Prior content knowledge activation Metacognitive knowledge activation	Efficacy judgements Task value activation Interest activation Ease of leaning judgements; perceptions of task difficulty	[Planning for self-observation of behaviour]	[Perceptions of context]
Monitoring	Metacognitive awareness and monitoring of cognition	Awareness and monitoring of motivation and affect Self-observation of behaviour	Awareness and monitoring of effort, time use, need for help	Monitoring changing task and context conditions
Control	Selection and adaptation of cognitive strategies for learning, thinking	Selection and adaptation of strategies for managing motivation and affect	Increase/ decrease effort Persist, give up Help seeking behaviour	Change or renegotiate task Change or renegotiate context
Reaction and reflection	Cognitive judgements Attributions	Affective reactions Attributions	Choice behaviour	Evaluation of task and context

that they are hierarchically or linearly structured such that earlier phases always must occur before latter phases. These phases can be ongoing simultaneously and dynamically - goals and plans can change based on feedback from monitoring, control and reflection processes. In fact, some models (e.g. Zimmerman, 2000) have included the monitoring and control processes into one phase. More work is needed to refine this SRL framework by specifying how different phases (macro-processes) and structural components (micro-processes) relate to each other (Zeidner, Boekaerts & Pintrich, 2000).

1.2.3. A Taxonomy of Self-Regulation Strategies

Much research on SRL during the 1980s and 1990s has been concerned with cognitive control while the interest in the regulation of motivation, affect, behaviour and context has started to grow in the late 1990s. The development of measures that ensued (Lopez, 1999; McCann & Garcia, 1999; Wolters, 1998, 1999) lead to a confusing proliferation of terms (i.e. different terms used to refer to similar aspects of self-regulation) (Pintrich, 1999a). This highlights the problem created by a lack of a consistent terminology and taxonomy also noticed in the general SR literature (Zeidner et al., 2000). Aiming to improve consistency, Pintrich (1999a) compiled a first provisional taxonomy of strategies for the regulation of motivation, affect, behaviour and context; this was later refined in the areas of motivation and behaviour control by Wolters, Pintrich and Karabenick (2005). The strategies presented next are based on the classifications provided by Pintrich (1999a) and Wolters et al. (2005), while the cognitive and meta-cognitive strategies are drawn from popular measure of SRL (Pintrich, Smith, Garcia & McKeachie, 1991, 1993; Zimmerman & Martinez-Pons, 1988, 1990).

Cognitive Strategies

- *Rehearsal* strategies include attempts to memorize material by repeating it over and over again or other types of shallow processing
- *Elaboration* strategies reflect a deeper approach to learning by attempting to summarize the material, put the material into one's own words and so forth

- *Organizational* strategies also involve deeper processing through the use of various tactics such as taking notes, drawing diagrams, or developing concept maps to organize the material in some manner

Metacognitive Regulation Strategies

- ‘*Planning*’ activities reflect students’ tendency to set goals or think through what they want to get done before beginning a task
- *Monitoring* activities include students’ observation of their cognitive strategy use and the evaluation of these strategies’ effectiveness
- *Regulation* strategies refer to students’ control or adjustment of their cognitive strategies to fit ongoing task requirements or comprehension level.

Motivational Regulation Strategies

- *Self-Consequating* – students establish and provide themselves with extrinsic consequence such as concrete or verbal rewards and punishments for their engagement in learning activities
- *Goal Self-Induction* strategies consist of thoughts or subvocal statements to recall or make salient reasons for wanting to complete an activity such as getting higher grades, or doing well in a class (*Performance or Extrinsic Self-Talk*), doing better than others or showing one’s inner ability (*Performance/Relative Ability Self-Talk*) and satisfying one’s curiosity, becoming more competent or knowledgeable, or increasing feelings of autonomy (*Mastery Self-Talk*).
- *Interest Enhancement* strategies describe activities in which students work to increase their intrinsic motivation for a task either by improving their situational interest or immediate enjoyment experienced (*Situational Interest Enhancement*) or by increasing the relevance or meaningfulness of a task by linking it to personal interest and value (*Relevance Enhancement*).
- *Self-Efficacy Control* strategies are designated to calibrate or bolster self-efficacy or confidence in doing tasks such as engaging in positive self-talk (i.e. ‘I can do this’), recalling previous successes, and using downward social comparison to increase self-efficacy.

Affect Regulation Strategies

- *Increase Positive Emotions or Mood* – includes strategies to increase or heighten positive emotions or moods such as visualising or recalling positive past or positive affect, meditating or exercising to induce positive emotions or mood, putting on music to get into a mood
- *Decrease Negative Emotions or Mood* – includes strategies to decrease or lessen negative emotions or moods such as counting to 10 to lessen frustration, taking deep breaths to lessen anxiety
- *Induction of Negative Emotions for Positive Outcomes* – include strategies to induce negative emotions in order to bolster effort or performance including inducing anxiety or guilt as a spur to action or increased effort.

Behaviour Regulation Strategies

- *Choice Behaviour* regulation – refers to actively choosing one option over another
- *Effort and Persistence* regulation– includes strategies to bolster or maintain effort and persistence such as self-talk
- *Help-Seeking* regulation – include students' intentions to seek or avoid seeking help, their help-seeking goals (instrumental vs. expedient) and their preferred sources (formal vs. informal)
- *Time Use* regulation – includes the use of various strategies for managing time and making daily, weekly, or monthly schedules

Environment Regulation Strategies

- *Tasks and Materials* regulation – includes strategies to control or regulate specific academic tasks such as negotiating the task with the teacher to make it easier, changing the task to something that one can perform, making sure all the materials for a task are available
- *General Environment* regulation – includes strategies to control the general context such as reducing distractions, finding a quiet study place, using a specific place to study

- *Control of Others* regulation – includes strategies to control the teacher or peers in the context in order to learn, such as asking others to be quiet when trying to study, getting peers in a group to focus on academic task, using peers to learn together

The classification of motivational strategies presented above, although not complete, does represent a cross section of the adaptive ways in which students can attempt to manage their motivation or motivational processes (Pintrich, 1999a; Wolters, 2003; Wolters et al., 2005). Other motivational strategies incorporated into some models of SRL (e.g. Garcia & Pintrich, 1994) included maladaptive strategies such as self-handicapping, procrastination (i.e. withholding or delaying of effort to maintain self-worth) and self-affirmations (protecting self-worth by devaluing the task).

Pintrich's (1999a) taxonomy is particularly valuable for directing future research in SR for two reasons. Firstly, it contains specific and micro-level strategies which provide for a tractable conceptual foundation for future research in line with recommendations made by Zeidner et al. (2000). Other taxonomies (e.g. Randi & Corno, 2000) that list some general domains (e.g. motivation, affect) or general strategies (e.g. positive thinking) may be too global and general to help with the development of a consistent terminology. Secondly, it adopts a structural approach that focuses on theoretically well established constructs from the areas of motivation, affect, behaviour and context that could be brought under the control of the learner (Pintrich, 1999a). This approach is different from a more functional perspective which focuses on general regulatory activities such as self-talk (e.g. Zimmerman, 2000) in which the content of the self-talk could be on any aspect of motivation or affect.

An overall portrait of SR incorporates the core monitoring and control phases and a variety of peripheral processes such as cognitive and motivational antecedents in the forethought/activation phase and/or the affective and behavioural consequences of the reaction and reflection phase (Pintrich, 2000a). There are few studies that focus on the relations between the core SR processes and multiple antecedents or consequences (Winne & Perry, 2000; Zeidner et al., 2000). *This thesis aimed to investigate a SR model consisting of multiple*

motivational antecedents (four achievement goals, efficacy and value beliefs) and core SR processes such as planning, monitoring and motivational control in two domains.

1.2.4. Methodological Issues in Self-Regulated Learning

Measurement Issues. Many researchers in the field noted that more work is needed to develop better models of SRL as guides for developing measures of SRL (Pintrich et al., 2000; Winne & Perry, 2000). This is, however, a bootstrapping process as the *sine qua non* for further development of SRL models is the use of valid and reliable measures (Winne & Perry, 2000). Conceptualizations of SRL vary in grain size from very large, as aptitudes, to very small, as events (Winne, 1997; Winne & Perry, 2000; Winne & Stockley, 1998). When SRL is measured as an aptitude, a single measure aggregates over or abstracts some quality of SRL based on multiple SRL events. Typically self-report measures of SRL as an aptitude ask respondents to generalize their actions across situations rather than referencing singular or specific learning events while learners experience them. SRL as an aptitude varies within individuals over relatively long time periods, within individuals across different tasks and settings, and across individuals (Pintrich et al., 2000; Winne, 1996; Winne & Perry, 2000). In line with the research focus of this thesis, only measurement issues pertaining to SR as an aptitude will be addressed next.

The construct validity of well established measures of SR is threatened by their failure to reflect adequately all areas of SR (Pintrich et al., 2000). Most scales measure cognitive and metacognitive strategies: the Self-Regulation Learning Interview Schedule (SRLIS; Zimmerman & Martinez-Pons, 1986, 1988, 1990) consists of 14 categories of which one is a motivational strategy (i.e. self-reward); the Learning and Strategies Study Inventory (LASSI; Weinstein, Schulte, & Palmer, 1987) contains 10 scales of which one is a mixed scale of motivational and behavioural regulation strategies (i.e. motivation, diligence, self-discipline and willingness to work hard) and one is a behavioural control scale (use of time management principles); and the Motivated Strategies for Learning Questionnaire (MSLQ; Pintrich et al., 1991; 1993) contains 10 scales of which four are behavioural and environment control scales (effort regulation, time and study environment, peer learning and help seeking). Only one

questionnaire was found in the SR literature which reflects both metacognitive and motivational areas of self-regulation – the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995, 1996). This instrument measures planning, self-monitoring, other-related monitoring (labelled social comparison), and two self-consequating strategies (self-reward and self-criticism).

More recently, a number of valid and reliable scales have been developed to measure the regulation of behaviour, motivation, and affect. The Academic Delay of Gratification Scale (ADOGS; Bembenuddy, 1999) measures students' willingness to choose academic tasks over other tasks (i.e. behavioural regulation). Wolters (1998; 1999; Wolters et al., 2005) developed six scales of motivational regulation (i.e. self-consequating, mastery self-talk, performance / relative ability self-talk, performance / extrinsic self-talk, situational interest enhancement, and relevance enhancement). The Academic Volitional Strategy Inventory (AVSI; McCann & Garcia, 1999) consists of two motivational scales (i.e. self-efficacy enhancement and negative-based incentives) and one affect regulation scales (stress reducing actions). In relation to self-consequating as a motivational regulation strategy, it is important to note that although conceptualised as the use of both positive and negative consequences (e.g. Wolters, 1998, 1999), Wolters' self-consequating scale (i.e. self-reward), and McCann and Garcia's negative-based incentives scale reflect only one aspect of this construct. The GSAB (Karoly & Ruehlman, 1995, 1996) is the only questionnaire which measures the use of both positive and negative consequences through its self-reward and self-criticism scales. *The GSAB was selected for this thesis due to its unique features highlighted above as well as its flexibility of application in different life domains.*

Research Design Issues. Much of the current research in SR has employed traditional correlational methods or simplistic experimental designs (Pintrich, 2000a; Zeidner et al., 2000). This kind of design, can provide useful data during the first stages of development in new research areas such as motivational, affective and behavioural regulation. However, the development of refined SR models requires more powerful designs and more sophisticated analytic techniques. Specifically, Pintrich (2000a) and Zeidner et al. (2000) suggested that multivariate and longitudinal designs and powerful statistical analyses such as structural

equation modelling are needed in order to capture the interactive nature of SR processes, and the changing magnitude or direction of relationships across contexts, time and cultures.

Structural equation modelling was employed in all for studies in order to test the generalisation of a SR model across two contexts and cultures and the temporal invariance at three time points (over one year); additionally, temporal changes were investigated through latent growth curve modelling (study 4).

1.3. Achievement Goals and Self-Regulation

1.3.1. Motivation, Metacognition and Motivational Regulation: Conceptual Differences

Motivation and Motivational Regulation

From a cognitive perspective, motivation can be characterized as either a product or a process (Winne & Marx, 1989). Motivation viewed as a product or state refers to the willingness to engage in and persist at a task (i.e. the level of motivation). Motivation can also be viewed as the process or processes that determine the state or level of motivation. Such processes would account for a student feeling efficacious at, or being interested in, or wanting to master a task. In short, motivation refers to both the level of motivation and the processes of motivation that influence that level (Pintrich & Schunk, 2002).

Consistent with this view of motivation, Wolters (2003) argued that the regulation of motivation refers to the activities through which individuals purposefully act to influence or enhance their level of motivation by deliberately controlling one or more processes of motivation; it includes those thoughts, actions and behaviours through which students act to influence their choice, effort or persistence for various academic tasks.

Motivation and the regulation of motivation are differentiated conceptually by the awareness or purposefulness of individuals' thoughts and actions (Wolters, 2003). This distinction is described by Boekaerts (1992) as the difference between subjective control (i.e. the influence that beliefs and perceptions have on behaviour) and objective control (i.e. the individual's

conscious intent to manipulate his or her beliefs and perceptions in order to change behaviour). Theories of motivation emphasise the subjective control that various beliefs and perceptions (i.e. goals, value, efficacy) have on choice, effort and persistence, whereas models of motivational regulation emphasise the individual's active control of these beliefs as a means of influencing behaviour (Wolters, 2003).

Metacognition and Motivational Regulation

Like motivation, metacognition is considered an important element in SRL (Pintrich et al., 2000; Zimmerman, 1994). Metacognition is frequently described as consisting of two components including knowledge of cognition and regulation of cognition (Brown, Bransford, Ferrara & Campione, 1983). The regulation of cognition involves efforts to monitor, control and adjust cognitive processing (i.e. comprehension) in response to challenging task demands (i.e. planning how to complete a task, selecting the cognitive strategies to be used, monitoring the effectiveness of these strategies, modifying or changing the cognitive strategies used when encountering problems) (Pintrich et al., 2000; Schraw & Moshmann, 1995).

The regulation of cognition and the regulation of motivation are similar concepts which can be differentiated based on the purposes they serve (Wolters, 2003). The strategies for the regulation of cognition influence *how* students complete a learning activity or which cognitive strategies they use to understand the material; in contrast, the strategies for the regulation of motivation influence *why* students are completing the learning task or for how long they remain involved with the task (Wolters, 2003). Though they can be distinguished conceptually, motivational and metacognitive regulation are expressions of the same SR system and are likely to work in conjunction with one another (Boekaerts, 1997; Wolters, 2003).

1.3.2. A Theoretical Integration of Motivation and Self-Regulation

Most empirical research to date have treated motivation and SR as distinct theoretical constructs that are related quantitatively – higher levels of motivation would lead to a greater

use of SR. However, early conceptualisations of achievement goals involved both the purpose for engagement and the actions that promote that purpose (e.g. Maehr, 1984; Nicholls, 1989). From this perspective, mastery and performance goals are associated with different SR strategies (qualitative relationship) rather than with higher or lower levels of SR. Pintrich (2000b) also suggested that students with Map and Pap goals may set different objectives, monitor different types of cues and use different regulation strategies. Drawing on early theorising, Kaplan and Maehr (2002) proposed an integrated model of achievement goals, self-perceptions and SR (i.e. motivation – strategy orientations). According to this model, SR is not a unitary construct (i.e. a set of SR strategies) but a multifaceted modular construct, and different SR strategies would be relevant to different purposes for engagement. Next, it is presented a brief review of literature on the relations of achievement goals, value and self-efficacy beliefs with metacognitive and motivational regulation strategies.

1.3.3. Motivational Correlates of Self-Regulation

Motivational Beliefs and Metacognitive Regulation: Research Findings

There is a great deal of convergent evidence that task value, self-efficacy and mastery goals are positively related to meta-cognitive SR strategy use (see Pintrich, 2000b for a review; Pintrich & Zusho, 2002; Wolters, 2004; Radosevich, Vaidyanathan, Yeo & Radosevich, 2004). On the other hand, the research findings on performance goals and SR are more ambiguous. Among both college and high school students, a mixed measure of performance goals (including approach and avoidance items) was positively related to a more frequent use of some (shallow and/or deep) cognitive and metacognitive strategies (Geene & Miller, 1996; Miller, Behrens, Greene, & Newman, 1993; Miller, Greene, Montalvo, Ravindran & Nichols, 1996; Varmetten, Lodewijks, & Vermunt, 2001); other studies found a negative relationship with some deep cognitive and metacognitive regulation (e.g. Nolen, 1988; Varmetten et al., 2001), yet other studies failed to support the link with either cognitive or metacognitive regulation (Archer, 1994; Pintrich & Garcia, 1991).

More recent research with measures that reflect only an approach or avoidance performance goals have also reported mixed findings (Kaplan & Midgley, 1997; Middleton & Midgley, 1997; Pintrich, 2000b; Radosevich et al., 2004; Wolters, 2004; Wolters, Yu, & Pintrich, 1996). Some of these mixed findings could be due to the use of different participants, measures and classroom contexts (Pintrich, 2000a). Taken together, these results suggest that Pap goals can have positive outcomes; specifically students with Pap goals use some cognitive and metacognitive strategies to regulate their learning and they tend to use more strategies than students with Pav goals. Research involving specific regulation strategies (as opposed to composite measures) has found patterns of relations more in line with the predictions of goal theory. Specifically, disorganisation was positively predicted by Pav (Elliot et al., 1999; Elliot & McGregor, 2001) and Mav goals (Elliot & McGregor, 2001) in undergraduate students.

Metacognitive regulation (i.e. planning, self-monitoring/evaluation and control) is based on self- or task-referenced standards of success. However, as shown in the achievement goal literature students can also use normative standards of competence, therefore they can monitor and evaluate progress on a task through social comparison (i.e. in comparison with the progress achieved by their peers on a similar task). There is no literature on social comparison as a self-regulation strategy (i.e. the intentional systematic monitoring/evaluation of progress in comparison with peers). A handful of studies on achievement goals and feedback seeking support theoretical predictions: Pap was positively associated to interest in normative feedback and the dispositional tendency to seek normative information (Butler, 1992; 1993; Darnon et al. 2010; Regner, Escibe & Dupeyart, 2007). In summary, the existing literature provides some evidence that students with adaptive motivational beliefs use several metacognitive regulation strategies. Further research is needed to determine how approach and avoidance goals may be differentially related to specific metacognitive regulation strategies (Pintrich, 2000a,b).

Motivational Beliefs and Motivational Regulation: Research Findings

There is limited research on the relationship between motivational beliefs and motivational strategy use. Wolters (1998) found that the motivational strategies used by college students

were consistent with their goal orientations: students who frequently used strategies based on intrinsic forms of motivation had a greater focus on mastery goals, whereas students using strategies based on extrinsic forms of motivation reported a greater focus on performance goals. Research investigating separate motivational regulation strategies has reported the following: value was a positive predictor of mastery self-talk, self-reward and interest-enhancement, but did not predict performance self-talk (Sansone, Weir, Harpster & Morgan, 1992; Sansone, Wiebe & Morgan, 1999; Wolters & Rosenthal, 2000); self-efficacy was positively correlated with performance and mastery self-talk and interest enhancement and not related to self-reward (Wolters & Rosenthal, 2000); mastery goals were positively related to self-reward, performance self-talk, mastery self-talk and interest-enhancement (Bembenutty, 1999; Wolters & Rosenthal, 2000); performance goal orientation was a significant predictor of self-reward and performance self-talk (Wolters & Rosenthal, 2000); and Pap goals were positively related to self-efficacy enhancement strategies while Pav goals were positively related to negative-based incentives (Bembenutty, 1999). No studies to date have examined approach and avoidance achievement goals in relation to both positive and negative self-consequating.

1.3.4. The Domain Generalisation of Self-Regulation Correlates

Social-cognitive models predict that both individual and environmental characteristics are central to the understanding of SR. Specifically, Kaplan and colleagues (Kaplan & Maehr, 2002; Kaplan et al., 2009) argued that achievement goals and SR strategies may be integrated in ‘contextualised motivation-strategy orientations’ as the fit between certain purposes for engagement and SR strategies may depend on contextual affordances. From this perspective, contextual characteristics may make certain strategies more or less relevant for different purposes of engagement. Therefore, Map and Pap goals may call for different SR strategies in different life domains such as academic and physical activity settings which vary in term of the public versus private nature of performance, implicit versus explicit emphasis on competition, high versus low levels of competitiveness or probability of success/failure. However, little attention has been given to how different features of the context can facilitate or constrain SR (e.g. Pintrich, 2000a,b).

Generalisation Across Academic Subjects

Most models of SRL assume that the relationships between motivational beliefs and SR will be similar across academic subject areas. However, given the arguments for discipline differences in classroom contexts and instruction (e.g. Grossman & Stodolsky, 1995; Stodolsky & Grossman, 1995), there could be domain or discipline differences in these relationships. Few studies tested these predictions to date. Wolters et al. (1996) found that the relationships between metacognitive regulation and goal orientations were replicated across three academic subjects (i.e. math, English, and social studies). Similarly, Wolters and Pintrich (1998) found task value and self-efficacy to predict cognitive and metacognitive regulation across the same three subject areas. On the other hand, VanderStoep et al. (1996) reported differences between high and low final grade students in their use of metacognitive strategies in natural science courses, but not in social science or humanities courses. In summary, these data suggest that the relationships between motivational beliefs (i.e. approach goal orientations, task value and self-efficacy) and composite measures of metacognitive strategy use do generalize across some academic subjects. Further research is needed to investigate whether these generalisations across academic subjects also hold true for avoidance goals, distinct metacognitive strategies, and non-academic domains.

Generalisation to the Physical Activity Domain

Research in to SR strategies is critical in sport and exercise since SR underlies the effectiveness of every technique used to enhance sport performance and sustained exercise participation (e.g. goal setting, imagery, relaxation) (Crews, 1992). The SR literature in the sport and exercise domain suffers from a number of important limitations. According to a literature review of 34 studies published in the 1990s (Crews, Lochbaum, & Karoly, 2001) the use of the term self-regulation betrays a lack of conceptual clarity and systematic operationalisation. The wide variety of theories and measures identified in this review indicates that SR is used as an umbrella term rather than a set of strategies or processes. Much of this research was not based on a SR paradigm and has not conceptualised motivational

beliefs as components that can be regulated. Crews et al. (2001) concluded that ‘the field is in need of a more systematic, unifying approach to the study of self-regulation’ (p. 578).

There is limited research investigating achievement goals and metacognitive SR strategies in the physical activity domain (i.e. planning, self-monitoring and self-evaluation). In three correlational studies, only task orientation was a positive predictor of these strategies (Ommundsen, 2006; Papaioannou, Simou, Kosmidou, Milosis & Tsigilis, 2009; Theodosiou & Papaioannou, 2006). In addition to self-referenced standards, athletes and exercisers can monitor and evaluate goal progress in comparison with that of their peers. Self-monitoring and social comparison distinguished regular and irregular exercisers, and were positively related to exercise participation (Karoly, Ruehlman, Okun, Lutz, Newton, & Fairholm, 2005; Lutz, Karoly, & Okun, 2008; Macdonald & Palfai, 2008), while in physical education students with high ego orientation and high perceived competence sought comparative feedback and rejected objective task feedback (Cury & Sarrazin, 1998).

There is also limited research on achievement goals and motivational regulation strategies. Experimental and correlational studies with physical education students showed that Map and Pap were negatively related and Pav was positively related to self-handicapping (a self-protective regulatory strategy) (Cury, 2000; Curry et al., 2003; Elliot et al., 2006; Ommundsen, 2001; 2004; 2006). Similarly, there is some indirect evidence gleaned from mental skills studies: athletes who were moderate-to-high or high in both task and ego orientation engaged more often in motivational imagery associated with skill development and winning, and used more positive self-talk (a form of self-reinforcement) than those with other profiles (Cumming, Hall, Harwood, & Gammage, 2002; Harwood, Cumming, & Hall, 2003; Harwood, Cumming, & Fletcher, 2004; Van de Pol & Kavussanu, 2011). There is scant literature on self-consequating; for example, self-determination predicted self-reward but not self-criticism in exercise (Lutz et al., 2008). Further research is needed to investigate the relations between motivational beliefs (achievement goals, efficacy and value) and SR processes in the physical activity domain.

1.3.5. The Cultural Generalisation of Self-Regulation Correlates

SR research has a distinct Western and North American flavour to it, and a typical emphasis on the individual (e.g. Pintrich, 2000a). Therefore, SR models may not generalise or operate the same in cultures with more collectivistic values (e.g. Boekaerts, 1998). Kaplan and Maehr (2002) argued that goals and SR are constructed within a cultural milieu of values and norms which can imbue the same strategy with different meanings and, therefore, can influence its perceived relevance to engagement. Further research is needed on the extent to which SR models developed in individualistic cultures can be transferred to collectivistic cultures.

Generalisation of Cognitive / Meta-Cognitive Regulation Correlates

Research on motivational beliefs and SR carried out outside the US reported similar results to those found with American samples. In a few, mainly Western European countries, students' cognitive and/or meta-cognitive strategy use was positively related to: self-efficacy, value, an approach tendency to achieve success, an incremental theory of intelligence and mastery goals, but not extrinsic or relative ability goals (Holland: Minnaert, 1999; Norway: Olaussen & Braten, 1998; Iran: Ostovar & Khayyer, 2004; Germany: Pintrich, Zusho, Schiefele, & Pekrun, 2001; Spain: Riveiro, Cabanach & Arias, 2001); also, these strategies were found to be negatively related to Pap goals and work avoidance orientation (Spain; Riveiro et al., 2001).

Generalisation of Motivational Regulation Correlates

There is little research on motivational beliefs and strategies outside of the US. However, the two studies identified reported relationships in the expected directions. In a sample of Spanish undergraduate students, Pap and Pav goals were positively related and Map goals were negatively related to maladaptive motivational strategies (i.e. self-handicapping, defensive pessimism, and self-protective affirmations; Riveiro et al., 2001). Similarly, in a Norwegian sample of undergraduate students, self-handicapping was negatively predicted by incremental theories of ability and positively by stable theories of ability (Ommundsen, Huegen, & Lund,

2005). Finally, both Australian and Japanese high achievers used more frequently self-consequating than low achievers (Purdie & Hattie, 1996).

In conclusion, from a SR perspective, this thesis aimed to investigate a complex SR model consisting of multiple motivational antecedents (achievement goals, personal goal efficacy and value) and a core of metacognitive and motivational SR processes, as well as the generalisation of this model across two domains, two cultures, and over time.

1.3.6. Conclusion

Relatively little is known about the implications of the four achievement goals for SR processes in academia, and even less in physical activity settings. Therefore, the main purpose of this thesis was the investigation of SR processes engendered by approach and avoidance goals. Specifically, in line with the integrated perspective on motivation and SR (Kaplan & Maehr, 2002; Kaplan et al., 2009) *this thesis aimed to investigate the fit between achievement goals, personal goal attributes and SR strategies, and the situated nature of these motivation-strategy orientations in different life domains (academia, sport, exercise contexts), different cultures (individualistic and collectivistic types) and over time.*

1.4. Research Questions and Hypotheses

The research questions relevant to each of the four studies in this thesis are presented next.

Study 1. Integrating achievement goals and self-regulation processes in the education domain:
A structural equation model

This study tested a SR model consisting of achievement goals, personal goal attributes, and SR strategies, in a sample of English university students, and employed a correlational design.

1. What SR strategies are linked to the four achievement goals in the academic domain in the UK?

2. What is the role played by personal goal attributes (difficulty, efficacy and value) in the relations between achievement goals and SR strategy use? Is goal difficulty a moderator of the SR model? Do goal efficacy and value mediate the relations between goals and SR processes?
3. What is the nature of personal goals set by English university students?

Study 2. Integrating achievement goals and self-regulation processes in two physical activity settings: A structural equation model

This study tested the generalisation of the academic SR model (study 1) to English university student-athletes and exercisers, and employed a correlational design.

4. What SR strategies are linked to the four achievement goals in the sport and exercise domains in the UK?
5. What is the role played by personal goal attributes (efficacy and value) in the relations between achievement goals and SR strategy use?
6. Are the relations between achievement goals and SR processes found in the sport and exercise domains similar to or different from those identified in the academic domain?
7. What is the nature of personal goals set by English university sport and exercise participants?

Study 3. Achievement goals and self-regulation processes: Cultural differences and model generalisation

Study 3a investigated cultural differences in individualistic and collectivistic self-definitions, achievement goals and SR strategies between elite and sub-elite athletes from the UK and Romania.

8. Are the Romanian and UK cultures different in their orientations towards individualism and collectivism? Is the Romanian culture more collectivistic than the UK culture?
9. Are there any differences between Romanian and UK elite and sub-elite athletes in the level of their achievement goals and SR strategy use?

Study 3b tested the cultural generalisation of the UK academic and sport SR models to university students and elite and sub-elite athletes from Romania; this study employed a correlational design.

10. What SR strategies are linked to the four achievement goals in the academic and sport domains in Romania?
11. What is the role played by personal goal attributes (efficacy and value) in the relations between achievement goals and SR strategy use?
12. Are the relations between achievement goals and SR processes found in Romanian university students and high level athletes similar to or different from those identified in English university students and athletes? To what extent culture is a moderator of achievement goals – SR relations?
13. What is the nature of the authentic personal goals set by Romanian university students and elite/sub-elite athletes?

Study 4. Temporal dynamics of achievement goals, self-regulation processes and their relationships in academic and sport settings.

This study tested the temporal stability of achievement goals, personal goal attributes, SR strategies and their relationships in a sample of English university students and athletes, through a longitudinal design.

14. Do the achievement goals of university students and athletes change during year one?
15. Do the SR strategies employed by university students and athletes change during year one?
16. Do the relations between achievement goals and SR strategies change during year one? Is the SR model invariant over time?
17. Are achievement goal changes related to SR changes over time?

The thesis tested the following hypotheses:

Hypothesis 1 (direct paths): The relations between achievement goals, goal efficacy and value, and SR strategies will be positive for Map, positive or null for Pap and negative or null for avoidance goals (studies 1, 2, and 3b).

Hypothesis 2 (mediators and moderators): Goal efficacy and/or value will be full or partial mediators of approach goal effects on SR; goal difficulty/specificity will moderate (attenuate) the relations between achievement goals and SR in education (studies 1, 2, and 3b).

Hypothesis 3 (cultural differences): The Romanian culture will be more collectivistic than the UK culture; and there will be differences in achievement goals and SR strategy use between Romanian and English elite and sub-elite athletes (study 3a).

Hypothesis 4 (domain and cultural generalisation): In the UK and Romania, most relations between achievement goals, personal goal attributes and SR in the physical activity domain will be similar to those found in the academic domain; also, most relations found in Romania will be similar to those found in the UK (studies 1, 2 and 3b).

Hypothesis 5 (personal goal content): Most students will set grade-related goals (both in the UK and Romania); most exercisers will set mastery goals; low level (university) English athletes will set a mixture of mastery and normative goals; and high level Romanian athletes will set mostly comparative goals (studies 1, 2, and 3b).

Hypothesis 6 (temporal stability and change): Map and Pav goals will change over time, while Pap and Mav goals will be stable; achievement goal relations with SR will be stable over time; achievement goal changes will be related to changes in personal goal efficacy and value, and SR strategies (study 4).

CHAPER 2. Study 1

Integrating achievement goals and self-regulation processes in the education domain: A structural equation model

2.1. Introduction

A good deal is known about the ‘whys’ or energizing factors of behaviour, but not enough about how motivation is maintained (Wolters, Benzion & Arroyo-Giner, 2011). Many learning tasks extend over time and students’ motivation is expected to ebb and flow as competing alternative activities appear along the way. Hence, an important question is what students do to maintain their motivation. Achievement goal theories focus on how motivation fluctuates as a function of personal and situational goals, but there is little focus on how to control or intentionally regulate motivation; in contrast, self-regulation models focus on how individuals come to purposefully control their own motivation, cognition and behaviour (Pintrich, 2000a; 2004). Hence, motivation and SR are intimately linked and an integration of achievement goal theory and SR models would be beneficial to both areas (Fryer & Elliot, 2008). The need for competence at the centre of achievement motivation provides the energy which instigates or activates competence-oriented behaviour; this motivational energy is channelled through goals towards specific SR processes and outcomes that satisfy the need for competence (Elliot & Church, 1997; 2002; Elliot & Dweck, 2005). Research over the past decade suggested that achievement goals are associated differently with the various components of self-regulation (Kaplan, Lichtinger, & Gorodetsky, 2009; Kaplan & Maehr, 2002). Next, achievement goals and self-regulation research are reviewed, highlighting gaps in both literatures, and an integrated model of achievement motivation and self-regulation is proposed.

Achievement Goals

For the past three decades achievement goals have received considerable attention in the study of motivation in education (Kaplan & Maehr, 2007; Meece, Anderman & Anderman, 2006). It is argued that the meaning of achievement behaviour to the individual and the goal of action are essential to the understanding of achievement motivation. Variations in behaviour are not

reflections of high or low motivation per se as expressions of different perceptions of meaningful goals in the achievement context (Roberts, Abrahamsen, & Lemyre, 2009). Thus, the investment of effort, talent and time in an activity are dependent on the achievement goal of the individual in that activity.

Early on, researchers defined goals as the overarching purposes (or goal orientations) of competence-relevant behaviour and distinguished between two types of goals: mastery goals that focus on developing competence and task mastery, and performance goals that focus on demonstrating competence in comparison with others (Dweck, 1986; Maehr, 1983; Nicholls, 1984). The goals adopted were posited to create a framework for how individuals interpret and experience the achievement settings (Roberts et al., 2009). Research findings generally confirm that mastery and performance goals have a different pattern of cognitive, affective and achievement outcomes and processes. Nevertheless, controversy surrounds the nature of these processes and outcomes. Several reviews from the 1990s concluded rather unequivocally that the two goals were associated with a divergent set of outcomes – positive for mastery goal and negative for performance goals (Elliot, 2005; Roberts et al., 2009). However, a closer examination of this body of research can be summarized more accurately as follows: mastery goals have consistent positive relations with motivational / affective variables, and either positive (e.g. Church, Elliot & Gable, 2001; Grant & Dweck, 2003) or null effects on academic performance (e.g. Elliot & McGregor, 2001; Harackiewicz, Barron, Tauer, Carter, & Elliot, 2002); performance goals can have positive or null effects on adaptive variables; and the associations of performance goals with maladaptive variables are mixed and their effects may depend on personal and environmental characteristics (Harackiewicz et al., 2002; Kaplan & Middleton, 2002; Midgley, Kaplan & Middleton, 2001).

One reason for the mixed pattern of findings for performance goals could be the failure to distinguish between approach and avoidance goals in the original formulations of achievement goal theory (Ames, 1992; Dweck, 1986; Nicholls, 1989). During the late 1990s and early 2000s, first performance then mastery goals have been partitioned into approach and avoidance (e.g. Elliot, 1999; Elliot & Church, 1997; Elliot & McGregor, 2001): students who adopt performance-avoidance goals (Pav) strive to avoid unfavourable judgments of their

competence by trying not to look more incompetent than others, while student with mastery-avoidance goals (Mav) try to avoid self-referenced failure such as loss or stagnation of competence, forgetting what was learned and missing opportunities to master a task. The separation of performance goals led to a more consistent pattern of outcomes, generally adaptive for Pap (though not always) and maladaptive for Pav (Linnenbrink, 2005; Zusho, Karabenick, Sims & Rhee-Bonney, 2007); while the new Mav goal was often excluded from investigations (e.g. Levy-Tossman, Kaplan & Assor, 2007; McGregor & Elliot, 2002; Senko & Harackiewicz, 2005). *Therefore, this study aimed to investigate both approach and avoidance goals.*

A second possible reason for the mixed pattern of outcomes associated with performance goals could be the failure to consider the moderating influence of perceived competence. A tenet of early achievement goal theorizing (e.g. Dweck, 1986; Nicholls, 1984) was that perceived competence moderated the effects of performance goals: positive outcomes were expected with high perceptions of competence and negative outcomes when feelings of incompetence prevailed. Minimal research on the moderator hypothesis has been conducted and the extant data have yielded mixed results (Elliot, 2005): some studies found them, though not always consistent with theoretical predictions (i.e. adaptive high efficacy: e.g. Butler, 1993; Coutinho & Neuman, 2008; adaptive low efficacy: e.g. Harackiewicz, Barron, Carter, Lehto & Elliot, 1997; Miller, Greene, Montalvo, Ravindran, & Nichols, 1996), while others did not (e.g. Cury, Elliot, Da Fonseca & Moller, 2006; Elliot & Harackiewicz, 1996; Harackiewicz, Barron, Tauer, Carter & Elliot, 2000). Moreover, some studies actually found an interaction between self-efficacy and mastery goals (e.g. Bouffard, Bouchard, Goulet, Denoncourt & Couture, 2005; Kaplan & Midgley, 1997; Miller et al., 1996). These mixed and unexpected findings on the moderating role of competence could be due to a failure to take into account the importance or value students attach to their goals (Bouffard et al., 2005; Harackiewicz & Sansone, 1991; Hulleman, Durik, Schweigert & Harackiewicz, 2008). The concept of value is however an underdeveloped aspect of contemporary achievement goal theory (Elliot, 1997). *Therefore, this study aimed to investigate the interplay between achievement goals, self-efficacy and value.*

A third possible reason for mixed findings could be the inconsistent conceptualization and measurement of achievement goals. A meta-analytic review of 243 correlational studies found considerable variability in the operationalisation of all goals: Pap goal scales contained five dimensions (normative, appearance, evaluative, goal general, and no goal), mastery approach goal (Map) contained seven dimensions (potential, improve, task, general goal, learning goal, interest and not goal), and an additional category of fear/worry was found in avoidance goals measures (Hulleman, Schrager, Bodmann, & Harackiewicz, 2010). Hulleman et al. (2010) reported that these variations moderated the goal – outcome relations. For example, Pap had a positive relation with performance when the scales had a majority of normative comparison items, and a negative relation when the scales had a majority of appearance items or had both normative and appearance items; Map scales and performance outcomes were unrelated or positively related depending on whether the scale did or did not contain goal-relevant language, respectively. Elliot (1999; 2005) and others (Urdan, 1997; Urdan & Maehr, 1995; Urdan & Mestas, 2006) argued that self-presentation/appearance is a social goal and that performance goals should be conceptualized and operationalised in terms of social comparison only. Hence, the *Achievement Goal Questionnaire* (Elliot & Church, 2001) was selected for this study for its consistent operationalisations of performance goals in terms of normative comparison, and mastery goals in terms of potential attainment.

A fourth reason for mixed findings could be the incongruence between a priori achievement goal measures (researcher-defined meaning of goals) and personal self-set goals; and the role that personal goals play in the links between achievement goals and their outcomes. Firstly, when students are asked to describe their goals in their own words they do not usually generate performance goals that include elements of peer comparison and competition. This was found in elementary and secondary school (Lemons, 1996; Urdan, 2001; Urdan, Keneisel, & Mason, 1999) as well as in undergraduate students (Horowitz, 2010; Okun, Fairholme, Karoly, Ruehlman, & Newton, 2006). Secondly, most students' personal goals are approach rather than avoidance goals (e.g. Okun et al., 2006) and some students do not distinguish between approach and avoidance dimensions (Kaplan et al., 2009; Urdan & Mestas, 2006). These findings led some to question the external validity of achievement goals measured through questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006). Thirdly,

personal goals attributes (e.g. type, valence, specificity and difficulty) may act as moderators or mediators of achievement goal effects, though ‘goal orientation researchers seldom, if ever, take into account findings from goal setting theory’ (Seijts, Latham, Tasa, & Latham, 2004, p. 227). Self-set goals have been found to mediate the relations between dispositional variables and performance, but the findings of goal setting as moderators have been inconsistent (Locke & Latham, 1990; 2002). The most consistent mediator of achievement goal effects on academic performance in field studies was the combined attributes of goal difficulty and specificity (labelled goal difficulty) (Lee, Sheldon & Turban, 2003; Roney & O’Connor, 2008; Vande Walle, Cron & Slocum, 2001). Also, some studies confirmed goal difficulty as a moderator of achievement goal effects (e.g. Seijts et al., 2004; Senko & Harackiewicz, 2005a). According to Kozlowski and Bell (2006) ‘a theoretical integration of the goal-setting and achievement goal orientations and a disentangling of their distinct effects are needed’ (p. 900). *This study aims to identify and classify students’ personal goal contents in terms of valence, type, specificity and difficulty, and to examine the moderating role of goal difficulty/specificity in the relations between achievement goals and SR processes.*

In conclusion, the literature based on achievement goal theory can be summarized as follows: Map goal had consistently adaptive outcomes (with the exception of its relation with performance); Pap goal can have both adaptive and maladaptive outcomes, and the intervening role of perceived competence, task value and personal goals characteristics in these relations are not clear at present; and there is less research on avoidance goals, (particularly Mav), and this body of literature showed links to maladaptive outcomes. *This study investigated the nature of self-set personal goal contents, the relations between four achievement goals and self-regulation processes, and the intervening role of personal goal characteristics (efficacy, value and difficulty/specificity) in these relations.*

Self-Regulation

Theory and research on self-regulated academic learning addressed the question of how students become masters of their own learning processes. Pintrich (2000a) defined self-regulated learning as ‘an active, constructive process whereby learners set goals for their

learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of the environment' (p. 453). An important assumption of socio-cognitive self-regulation (SR) models is that students' motivation plays a crucial role in their adaptive engagement in learning (Karoly, 1993; Pintrich, 2000a; Zimmerman, 2000). Zimmerman (2000) stated that 'self-regulatory skills are of little value if a person cannot motivate themselves to use them' (p. 17).

Three sources of motivation considered crucial for students' engagement in SR are the focus of this study: achievement goals, self-efficacy for, and valuing of the task (e.g. Zimmerman, 2002). Achievement goals are posited to create a framework for how individuals interpret experience and react in achievement settings (e.g. Ames, 1992; Nicholls, 1989), therefore, goals may foster different 'pathways' or patterns of motivation, SR strategy use, and performance (Pintrich, 2000b). Self-efficacy is defined as personal judgment of one's capabilities to organize and execute courses of actions to attain designated goals (Bandura, 1986; 1997); students with high self-efficacy find and use better strategies to attain their goal and respond more positively to setbacks (Locke & Latham, 2002). Task value, defined as the importance of doing well on a given task (Eccles, 1983), is likely to impact the quality and quantity of SR strategy use (Wigfield, Hoa, & Lutz-Klanda, 2008; Zimmerman, 2000). In conclusion, students focused on learning and understanding are confident in their ability to reach valued goals, and may set different objectives, monitor their progress in relation to different types of cues, and use different motivation regulation strategies than students focused on outperforming others, who doubt their ability to reach valued goals.

Five SR strategies are the focus of this study: planning, monitoring in relation to self and others, and two self-consequating strategies, reward and criticism. Planning refers to the selection of strategies designed to attain a desired goal (Zimmerman & Martinez-Pons, 1990) and is an important mechanism of goal setting (Locke & Latham, 1990). Self-monitoring refers to the deliberate attention to one's performance, and the comparison of these observations to one's goal for the purpose of evaluating goal progress. In addition to self- or task-based standards, progress monitored in relation to others can also provide self-relevant

competence information (Elliot, Murayama & Pekrun, 2011); yet the SR literature has ignored thus far students' intentional engagement in monitoring through social comparison.

Monitoring and evaluation of goal progress are followed by feelings of satisfaction or dissatisfaction and relevant motivational strategies designed to maintain or increase motivation (e.g. self-consequating) (cf. Wolters, Pintrich, & Karabenick, 2005). Self-consequating, a key process in the social learning conceptions of self-motivation (Bandura, 1986), includes the identification and administration of concrete or verbal reinforcements or punishments for goal progress or attainment levels on a complex task (Wolter, 1998, 2003). Despite its conceptualization as both positive and negative consequences, self-consequating continues to be operationalised as self-reward in popular measures of motivational regulation (Wolters, 1998, 1999; Wolters et al., 2005). *The Goal Systems Assessment Battery* (Karoly & Ruehlman, 1995), selected for this study, is the only questionnaire which provides separate scales for planning and self-monitoring (rather than a composite measure of planning, self-monitoring and control labelled metacognition); includes both self- and other-related monitoring/evaluation strategies, and captures both the positive and negative dimensions of self-consequating (i.e. self-reward and self-criticism).

There is little research with undergraduate students, which distinguished between approach and avoidance goals, and this body of work showed a fairly consistent pattern of positive relations between approach goals and metacognitive regulation (operationalised as a composite measure of planning, monitoring and control strategies); while the pattern of relations with avoidance goals was mostly null (e.g. Bartels & Megun-Jackson, 2009; Braten, Samuelstruen, & Stromo, 2004; Coutinho & Neuman, 2008; Howell & Watson, 2004). Similar results were found with disorganisation (defined as the learners' difficulty to establish or maintaining a structured, organized approach to studying; Entwistle, 1988): approach goals were either negative or null predictors and avoidance goals were positive predictors (Coutinho & Neuman, 2008; Elliot & McGregor, 2001; Elliot, McGregor & Gable, 1999; Howell & Watson, 2004; Senko & Miles, 2008). Furthermore, there is some evidence that self-efficacy influenced the effect of achievement goals on SR strategy use (e.g. Bandalos, Finney & Geske, 2003; Braten et al. 2004; Coutinho & Neuman, 2008; Kaplan & Midgley, 1997; Miller, Behrens, Greene, & Newman, 1993). The relations of self-efficacy and value beliefs with

metacognitive regulation were consistently positive (e.g. Braten et al., 2004; Coutinho & Neuman, 2008; Kitsantas, Winsler & Huie, 2008; Wolters & Pintrich, 1998). Finally, in one study approach goals and value were positive predictors of self-reward, while self-efficacy was unrelated to it (Wolters & Rosenthal, 2000).

In conclusion, most SR studies investigated: the separate effects of one or two motivational variables from the forethought phase rather than the interplay between them; approach rather than avoidance goals; metacognitive rather than motivation regulation strategies; composite measures of metacognitive regulation (planning, self-monitoring and control); only self-based monitoring, not social comparison; and only the self-reward aspect of motivational self-consequating. *Thus, this study aimed to investigate the interactive effects of achievement goals (both approach and avoidance types), self-efficacy and value on the use of planning, monitoring of progress in relation to self and others, and two types of self-consequating (self-reward and self-criticism).*

Summary and Hypotheses

Drawing on the limitations of achievement goals and SR literatures, this study makes a significant contribution to both areas of research by investigating: 1) the patterns of metacognitive and motivation regulation strategies associated with approach and avoidance goals (including two monitoring/evaluation and two self-consequating strategies); 2) the role of personal goal characteristics as mediators (efficacy and value) and moderators (difficulty/specificity) of these SR patterns; and 3) students' authentic personal goal contents (i.e. type, difficulty and specificity). A comprehensive model including all these variables has not been tested before in the academic domain.

Based on achievement goals and SR research findings, the following goal-strategy model paths are hypothesised (see figure 2.1.):

1. Achievement goals will have direct and indirect relations with planning and self-monitoring strategies, through goal efficacy and value: approach goals will be

positively related and avoidance goals will be unrelated (or negatively related) to self-efficacy and value; in turn, self-efficacy and value will be positive predictors of planning and self-monitoring; Pap and Pav goals will have positive and null or negative relations with social comparison, respectively.

2. Achievement goals will have indirect relations with self-consequating strategies through planning and monitoring strategies; this is in line with the sequence of SR model phases – control strategies are implemented following monitoring/evaluation of goal progress; approach goals will have positive relations and avoidance goals will have null or negative relations with self-consequating strategies.
3. Avoidance goals will have null or negative relations with self-reward, and null or positive links to self-criticism.
4. Personal goal difficulty/specificity will moderate (attenuate) the relations between achievement goals and SR strategies.
5. Students will set mostly approach performance-outcome personal goals (i.e. related to grades).

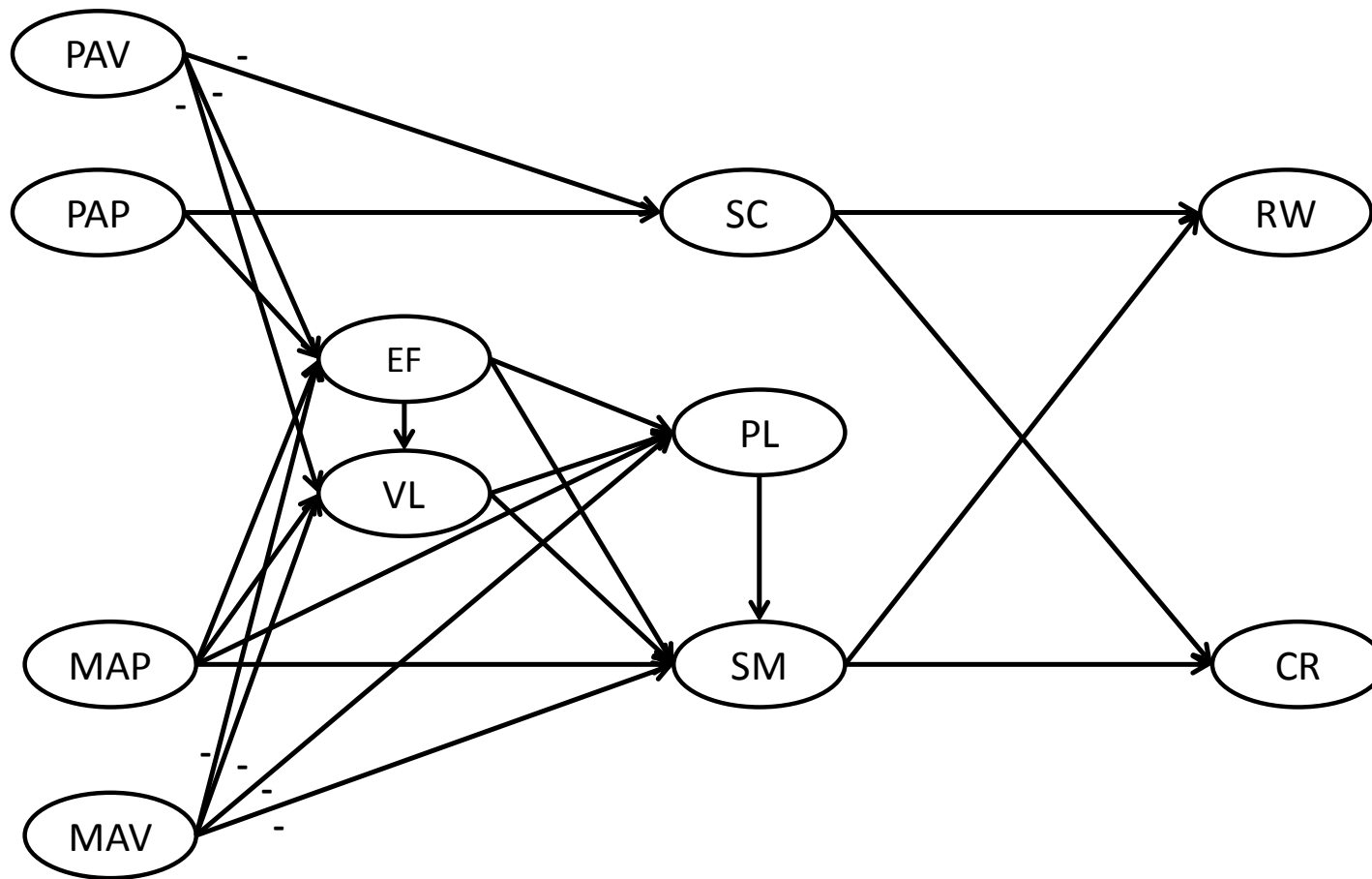


Figure 2.1. Hypothesised academic model 1 (PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PL – Planning, SM - Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

2.2. Method

Participants and Procedure

Participants in this study were 591 undergraduate students ($M = 20.3$ years $SD = 1.3$), 275 males (49.9%) and 287 females (48.6%) (9 unspecified); 233 year 1 (39.4%), 142 year 2 (24.0%) and 216 year 3 (36.5%). All participants were Caucasians. Based on personal goal difficulty/specificity (reported in the results section) the total sample was divided into two: sample 1 consisting of students with easy/vague goals ($N = 325$), 156 (48.6%) males, 165 (50.8%) females (four with missing gender information), 158 year 1 (46.8%), 75 year 2 (23.1%), and 92 year 3 (28.3%); and sample 2 included students with difficult/specific goals ($N = 266$), 139 (52.3%) were males, and 122 (45.9%) females (five with missing gender information), 75 year 1 (28.2%), 67 year 2 (25.2%), and 124 year 3 (46.6%).

All students completed independently a 10-minute questionnaire pack during a class, two or three weeks before assessment. The participants were provided with a brief explanation of the purpose of the study and were assured that their responses would remain confidential. Ethical committee approval for the research procedure, which complied with the guidelines of the British Psychological Society, was received from the relevant institutional body before data collection.

Measures

Achievement Goals. The Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) was developed to assess students' achievement goals; it comprises 12 items and measures four goals (three items per goal): mastery-approach (e.g. 'I want to learn as much as possible from this course'), mastery-avoidance (e.g. 'I worry that I may not learn all that I possibly could on this course'), performance-approach (e.g. 'It is important to me to do better than other students') and performance-avoidance (e.g. 'I just want to avoid doing poorly on this course'). The answer scale ranges from 1 (Not at all like me) to 7 (Completely like me) (see appendix 1). The authors reported adequate confirmatory validity and reliability indices with American

undergraduate students. The original questionnaire measures students' goals in relation to a specific subject of study by making references to 'this class' (i.e. states of goal involvement; Elliot & Conroy, 2005). In the present study, students' goals for the academic domain in general were measured through references to 'this degree'.

Personal Goal Attributes and Self-Regulation Strategies. Students identified their most important goal for the current semester, and then completed the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) in relation to this goal (see appendix 2). The seven scales (four items each) used in this study measure two personal goal characteristics – goal *value* (e.g. 'This goal is valuable to me') and goal *efficacy* (e.g. 'I have the ability to reach this goal'), and five SR strategies: *planning* refers to planning process steps, scheduling activities and preventing interference from other goals or people (e.g. 'I try to plan in advance the steps necessary to reach this goal'), *self-monitoring* refers to awareness of progress, successes, day-to-day behaviour and potential obstacles to progress (e.g. 'I keep track of my overall progress on this goal'); *social comparison* refers to the monitoring of one's progress in comparison with others of similar ability, who are working on a similar goal, and are doing better or worse than oneself (e.g. 'I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing better [worse] than I am'); *self-reward* refers to the use of positive reinforcement for satisfactory goal progress and hard work (e.g. 'I reward myself when I make progress toward this goal'), and *self-criticism* refers to verbal punishment for unsatisfactory progress or insufficient effort (e.g. I tend to criticize myself when I'm not making progress toward this goal'). Students were asked to indicate how well each statement described their work on their most important goals on a scale ranging from 0 to 4 (0 = Not at all; 4 = Extremely). The authors reported adequate confirmatory validity, reliability and social desirability indices in the academic domain.

Data Analysis

Validity and Reliability Analyses. The validity of both questionnaires was tested through exploratory factor analyses (EFAs) with varimax rotation and confirmatory factor analyses (CFAs), while the reliability of all subscales was based on Cronbach alphas.

The model fit was evaluated through a combination of comparative or relative goodness of fit indices – derived from comparisons between the hypothesised and independence models, and absolute fit indices – based on how well the hypothesised model fits the sample data (Browne, McCallum, Kim, Andersen & Glaser, 2002). Two relative indices were selected, the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI), and two absolute fit indices, the McDonald Fit Index (MFI) and the Root Mean Square Error of Approximation (RMSEA) with its 90% Confidence Intervals (90%CI). NNFI and CFI values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fit to the data (McDonald & Marsh, 1990); MFI values greater than .89 represent a well fitted model (Hu & Bentler, 1999). RMSEA values at or less than .05 and .08 are taken to reflect a close and reasonable fit, respectively (Jöreskog & Sörbom, 1993; Marsh, Bella & Hau, 1999). The chi-square statistic is often misleading due to its sensitivity to sample size (Chou & Bentler, 1995), and it does not directly provide degree of fit compared to other indices that are normed from 0 to 1 (Bagozzi, 1993). Therefore, due to relatively small samples in this study, the ratio between chi-square and degrees of freedom (χ^2/df) was used as a fit index; a ratio lower than 3 indicates a good fit (Kline, 1998).

The Hypothesized Model. Structural equation modelling (SEM) analyses with EQS 6.1 (Bentler & Wu, 2002) were conducted to test the hypothesized model in the total sample. Based on literature recommendations (Fan, Thompson & Wang, 1999; Hu & Bentler, 1998; Marsh, 2007) model fit was evaluated through a combination of relative and absolute goodness-of-fit indices: χ^2/df , NNFI, CFI, RMSEA, and CI90%. Simulation studies showed that these fit indices were the least influenced by sample size (Fan et al., 1999). Moreover, Hu and Bentler (1998) recommended CFI and RMSEA due to their sensitivity to model misspecification.

Goal Difficulty/Specificity – Moderation Effects. The invariance of the model identified in the total sample was tested with respect to goal difficulty/specificity (samples 1 and 2) through a series of steps for SEM multi-sample analyses outlined by Bentler and Wu (2002). During steps one and two well-fitted models were established in each sample separately, and then in both samples simultaneously; the latter unconstrained multi-sample model (model 1) served as

a baseline for the subsequent increasingly restrictive nested models. During the next three steps the multi-sample model was tested with equality constraints imposed on factor loadings (model 2), additional constraints on factor variances and covariances (model 3), and additional constraints on regression paths (model 4). Multi-sample invariance can be demonstrated in two ways: through the traditional method which requires a non-significant difference between chi-square values of the constrained and unconstrained models ($\Delta \chi^2 / \Delta_{s-B} \chi^2$, $p > .05$) (Satorra & Bentler, 2001), and/or through the more practical approach recommended by Cheung and Rensvold (2002) which requires the differences in CFI values between models to be negligible (i.e. $\Delta CFI \leq .01$). Personal goal difficulty/specificity moderates the relations between achievement goals and SR strategies if invariance (between modes 1 and 4) is *not* supported (i.e. $\Delta \chi^2 / \Delta_{s-B} \chi^2$, $p < .05$ and/or $\Delta CFI \geq .01$), and the values of the beta coefficients are different in the two samples (i.e. the model paths change with the level of goal difficulty/specificity).

Item Parcelling. Goodness-of-fit indices depend on the sample size and the number of parameters estimated, therefore the number of participants must be significantly larger than the number of parameters. To obtain good fit indexes, the ratio should be at least 5:1 (five individuals per estimated parameter) (Bentler & Chow, 1987). When models with a large number of parameters are tested in small samples a ratio smaller than 5:1 can produce poor fit indices. According to Bagozzi and Edwards (1998) the subjects-to-item ratio can be improved, by reducing the number of parameters estimated through item parcelling (i.e. summing or averaging two or more item scores and replacing item scores in a SEM analysis with parcel scores).

Although ‘the use of item parcels in SEM has become common in recent years’ (Bandalos, 2002, p. 78) the practice is not without controversy (Little, Cunningham, Shahar, & Widman, 2002). Models based on parcelled data have some advantages and disadvantages compared to item-level data. The merits include more parsimonious models (i.e. have fewer estimated parameters in defining a construct and in representing an entire model), fewer chances of correlated residuals or dual loading, and reductions in sampling error (MacCallum, Widaman, Zhang & Hong, 1999). The main areas of concern when using parcelled data are the

dimensionality of a construct and the potential for model misspecification (Little et al., 2002). Parcels drawn from items assessing a multidimensional construct (1) can distort a measurement model because biased loading estimates make it difficult to interpret the variance of a latent construct, and (2) can lead to a misspecified structural model, because associations of such latent variables with others in the model would be susceptible to alternative explanations (i.e. there would be uncertainty about which dimension or source of variance produced the structural effect). Therefore parcelling is deemed acceptable only when the purpose of a study is to investigate relations between latent variables (rather than the nature or dimensions of the measurement model) and the unidimensionality of a scale was demonstrated (Bagozzi & Edwards, 1998; Little et al., 2002).

Finally, there are different methods available to form item parcels and some of them improve goodness-of-fit indices more than others. In planned (as opposed to random) parcelling, items can be assigned to parcels based on either content or empirical rationale (Hall, Snell & Faust, 1999; Landis, Beal, & Tesluck, 2000): in the content method items are grouped together based on an analysis of their substantive characteristics; while in the empirical method parcels are based on the empirical properties of the data such as factor loadings provided by exploratory factor analyses (i.e. the items with the highest and lowest loadings are paired, then the items with the second highest and lowest loadings are paired, and so on) or correlations between items (i.e. items with the higher correlation are paired together, then items with the second highest correlation are assigned to a parcel, and so on). Rocha and Chelladurai (2012) tested the influence of the random, content and empirical strategies on goodness-of-fit indexes (e.g. NNFI, CFI, RMSEA) and concluded that the content method was the least effective and the empirical method was the most effective at improving fit indices.

In this study the ratio between sample size and estimated parameters in SEM was lower than 5:1 in sample 1 and 2. Therefore, the GSAB items were parcelled (two items per parcel, two parcels per subscale) after testing the unidimensionality of the GSAB subscales through EFAs. In order to avoid an artificial improvement of fit indices due to parcelling, the content method was adopted. The author and one other researcher discussed the substantive characteristics of the GSAB items' content before grouping them into parcels. Finally, the subjects-to-items

ratio in the total sample was above 5:1 indicating that parcelling was not necessary. However, as the final model identified in the total sample becomes the hypothesized model tested in samples 1 and 2, in the interest of consistency, GSAB parcelled items were also used in SEM analyses with the total sample.

2.3. Results

Preliminary Analyses

Personal Goals Analyses. Two individuals implemented a coding system that categorized each freely reported goal as improvement/mastery, process/mastery, outcome/performance and approach/avoidance according to achievement goals and goal setting literatures. The inter-coder agreement was 97.5% and disagreements were resolved through discussion. All goals were approach goals and none were performance-comparative (i.e. doing better than others) or ability goal (i.e. demonstrating one's ability to others) (Grant & Dweck, 2003). In sample 1, 325 students set easy and vague goals: 134 (41.2%) performance-outcome goals (i.e. 'pass'); 105 (32.3%) mastery-process goals (e.g. 'complete work on time', 'increase study time', 'keep up to date with directed study'), and 86 (26.5%) mastery- improvement goals (e.g. 'do as well as I can', 'do better than last semester/year'). In sample 2, 266 students set difficult outcome/performance goals: 189 (71.1%) were specific goals (i.e. 'get above 60% in all assignments and exams' or 'get at least 70% in all subjects') and 77 (28.9%) were vague goals (e.g. 'achieve a high standard', 'get good grades/marks'). Performance goals such as 'getting good/high grades' were labelled 'difficult' because generally students consider grades over 60% to be 'good' or 'high'. Overall, in the total sample 32% of students (N = 191) set mastery goals and 68% (N = 400) set performance-outcome goals – 23% pass and 45% grades (N = 134, and N = 266, respectively).

Descriptive Statistics and Correlations. Descriptive statistics, scales' reliabilities (Cronbach alpha) and correlations between all variables in the overall sample, sample 1 and sample 2 are presented in tables 2.1, 2.2, and 2.3, respectively.

Validity and Reliability Analyses. EFAs and CFAs on the AGQ items provided support for the four factor structure in the total sample, sample 1 and sample 2 (see CFA results in table 2.4). EFA on the GSAB extracted six factors (instead of seven): all planning and two self-monitoring items (i.e. 'I'm aware of my day-to-day behaviour as I work towards this goal' and 'I keep track of my overall progress towards this goal') loaded on one factor (labelled

Table 2.1. Descriptive statistics, alpha coefficients, and correlations for all variables in the total sample

	N	M	SD	Range	Alpha	1	2	3	4	5	6	7	8	9
1. Performance-Approach	588	4.19	1.45	6.00	.91									
2. Performance-Avoidance	588	4.51	1.49	6.00	.80	.12								
3. Mastery-Approach	588	5.40	1.05	6.00	.82	.20	-.06							
4. Mastery-Avoidance	588	4.60	1.24	6.00	.83	.15	.38	.36						
5. Goal Efficacy	591	2.79	0.60	3.25	.88	.21	-.20	.16	-.17					
6. Goal Value	591	3.36	0.62	3.25	.87	.08	-.05	.33	.10	.32				
7. Planning/Monitoring	591	2.27	0.59	3.50	.79	.13	-.08	.34	.03	.22	.37			
8. Social Comparison	591	1.74	0.87	4.00	.82	.37	.15	-.03	.13	.09	.09	.11		
9. Self-Reward	591	1.96	0.85	4.00	.89	.14	.05	.07	-.05	.22	.17	.33	.27	
10. Self-Criticism	591	2.07	0.83	4.00	.84	.16	.25	.13	.43	-.17	.14	.20	.38	.12

$r = .08 - .10$ $p < .05$; $r > .10$ $p < .01$

Table 2.2. Descriptive statistics, alpha coefficients and correlations for all variables in sample 1 (easy goals)

	N	M	SD	Range	Alpha	1	2	3	4	5	6	7	8	9
1. Performance-Approach	324	4.08	1.42	6.00	.91									
2. Performance-Avoidance	324	4.56	1.45	6.00	.78	.16								
3. Mastery-Approach	324	5.46	0.97	5.33	.79	.23	-.02							
4. Mastery-Avoidance	324	4.67	1.21	5.67	.81	.17	.37	.32						
5. Goal Efficacy	325	2.77	0.61	3.25	.87	.17	-.19	.20	-.22					
6. Goal Value	325	3.29	0.66	3.25	.88	.09	-.03	.33	.08	.35				
7. Planning/Monitoring	325	2.23	0.57	3.00	.78	.15	-.01	.34	-.02	.27	.38			
8. Social Comparison	325	1.72	0.90	4.00	.83	.44	.08	.00	.16	.08	.11	.18		
9. Self-Reward	325	1.96	0.85	4.00	.89	.19	.11	.03	-.06	.21	.17	.38	.33	
10. Self-Criticism	325	2.04	0.83	4.00	.85	.14	.26	.13	.41	-.13	.17	.23	.43	.20

$r = .11 - 1.3$ $p < .05$; $r > .15$ $p < .01$

Table 2.3. Descriptive statistics, alpha coefficients and correlations for all variables in sample 2 (difficult goals)

	N	M	SD	Range	Alpha	1	2	3	4	5	6	7	8	9
1. Performance-Approach	264	4.32	1.47	6.00	.91									
2. Performance-Avoidance	264	4.45	1.55	6.00	.82	.08								
3. Mastery-Approach	264	5.32	1.14	6.00	.84	.19	-.10							
4. Mastery-Avoidance	264	4.51	1.28	6.00	.84	.14	.38	.40						
5. Goal Efficacy	266	2.82	0.59	3.25	.89	.25	-.21	.13	-.10					
6. Goal Value	266	3.45	0.56	3.00	.85	.03	-.08	.36	.15	.28				
7. Planning/Monitoring	266	2.32	0.60	3.17	.80	.09	-.16	.35	.10	.15	.34			
8. Social Comparison	266	1.78	0.83	3.75	.80	.29	.12	-.07	.10	.11	.04	.02		
9. Self-Reward	266	1.95	0.84	4.00	.90	.08	-.03	.12	-.04	.23	.17	.28	.20	
10. Self-Criticism	266	2.10	0.83	4.00	.83	.17	.25	.13	.47	-.21	.10	.17	.32	.01

$r = .12 - .15$ $p < .05$; $r > .15$ $p < .01$

Table 2.4. Confirmatory factor analyses: Robust fit indices for both questionnaires in each sample.

	s-B χ^2/df	NNFI	CFI	MFI	RMSEA(CI90%)	
<hr/>						
Total Sample						
Achievement Goal Questionnaire	3.13	.95	.96	.92	.06	(.05 - .07)
Goal Systems Assessment Battery	1.98	.97	.98	.96	.04	(.03 - .05)
Sample 1 (easy goals)						
Achievement Goal Questionnaire	2.18	.95	.96	.92	.06	(.04 - .08)
Goal Systems Assessment Battery	1.63	.97	.98	.95	.04	(.03 - .06)
Sample 2 (difficult goals)						
Achievement Goal Questionnaire	2.11	.95	.96	.91	.07	(.05 - .08)
Goal Systems Assessment Battery	1.62	.96	.97	.94	.05	(.03 - .07)

planning/self-monitoring); the other two self-monitoring items loaded on other factors and were therefore deleted from further analyses. Problems with the self-monitoring scale have been reported before, such as low reliability (.63 and .65) and high correlations with planning (.70 and .72) (Lutz, Karoly & Okun, 2008; McDonald & Palfai, 2008). CFA on the GSAB parcelled items (i.e. three parcels to the planning/monitoring scale and two parcels to the other three scales) provided evidence for the six factor structure in each sample (see table 2.4). All scales were found to be reliable with alpha values ranging from .80 and .91 for AGQ and from .79 to .89 for GSAB (see tables 2.1., 2.2., and 2.3.). The hypothesized SR model including this new composite measure of planning and self-monitoring is shown in figure 2.2.

Main Analyses

The Hypothesized Model. In the hypothesised model Mardia coefficient was relatively large (normalized estimate = 30.85) indicating non-normality in the data. Therefore the robust (i.e. corrected for non-normality) maximum likelihood (ML) estimation method was used to analyse the data. Fit indexes in the total sample were adequate based on conventional standards (ML Robust: NNFI = .93; CFI = .94; RSMEA = .05 90% CI = .05 – .06; $\chi^2_{S-B}/df < 2.5$). Lagrange Multiplier (LM) tests suggested the addition of three links: Mav to self-criticism, and goal efficacy to self-reward and self-criticism. The links between Mav and self-criticism has not been shown in the literature as research has typically focused on Map goals. However, it is theoretically plausible that students with an avoidance focus will be dissatisfied with their progress and engage in self-criticism. Similarly, the link from self-efficacy to self-reward and self-criticism has not been shown in research. Nevertheless, it is possible that confident students use self-rewards to maintain their motivation on difficult, complex or boring learning task that constitute intermediate steps towards achieving their overall long-term personal goals. It is also possible that when progress is deemed unsatisfactory, high feelings of efficacy based on past experience have a protective effect against self-criticism. Following the inclusion of these links the final model (see figure 2.3) demonstrated good fit indices (ML Robust: NNFI = .95; CFI = .95; RMSEA = .04, 90% CI = .04 – .05; $\chi^2_{S-B}/df < 2$).

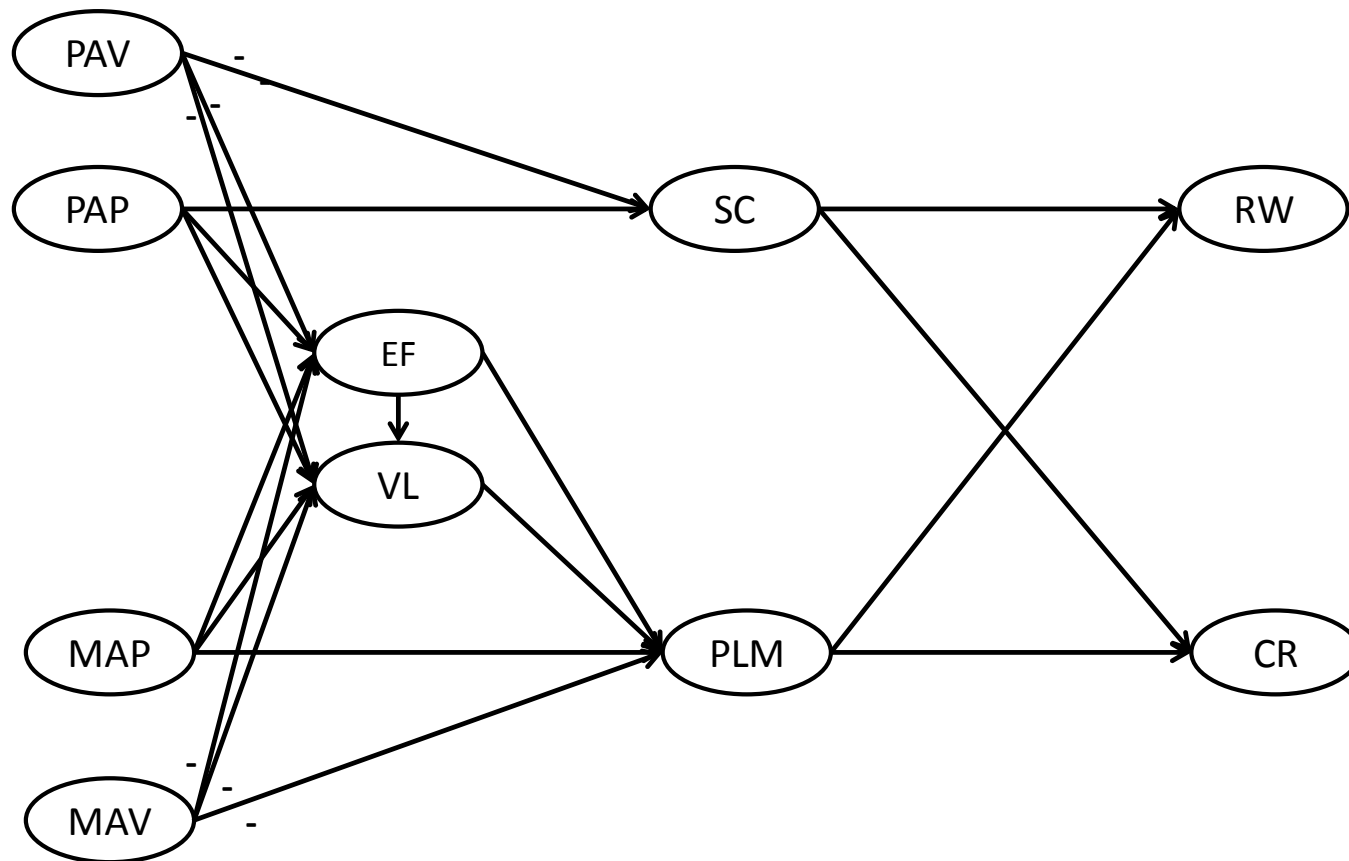


Figure 2.2. Hypothesised academic model 2 (PAV - Performance Avoidance, PAP - performance Approach, MAP – Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM – Planning/Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

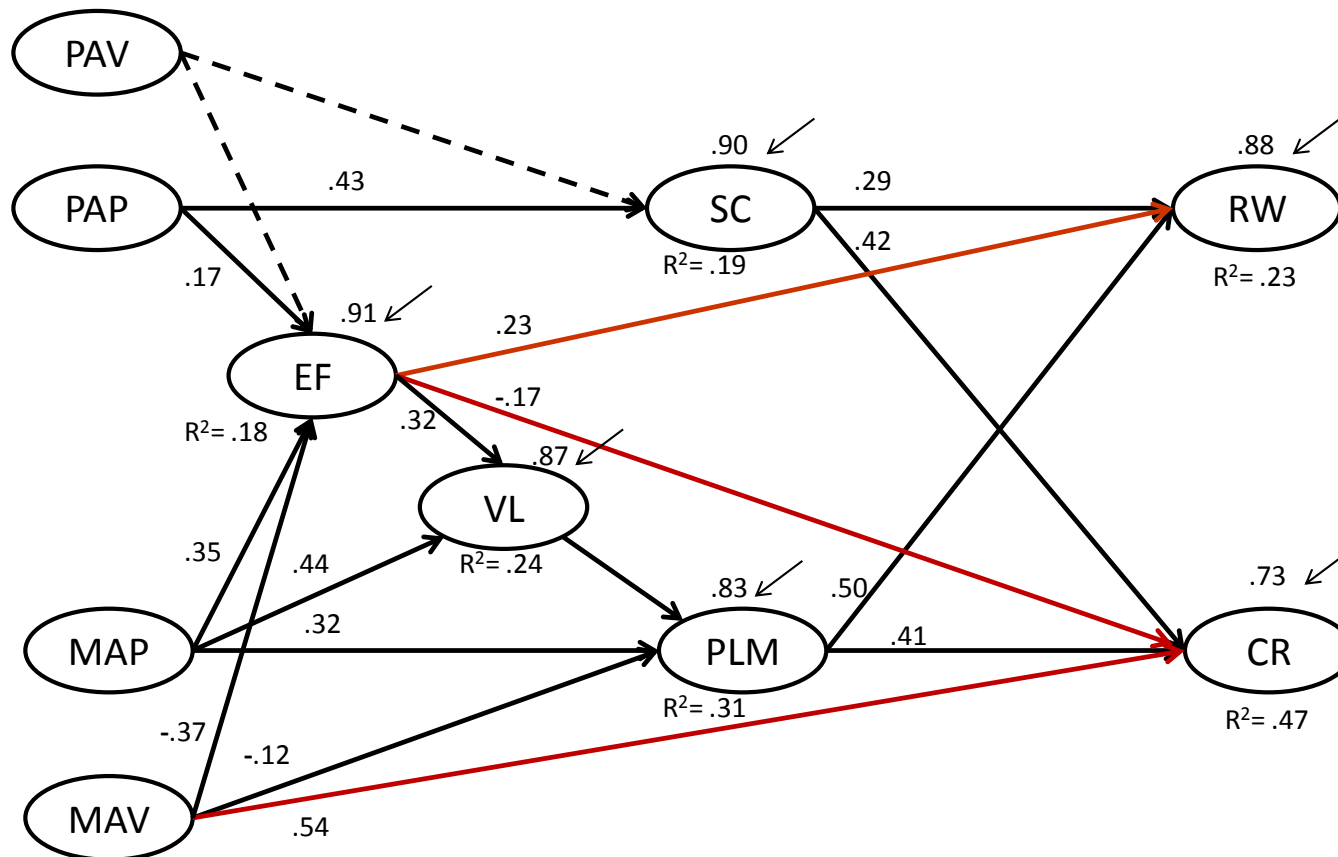


Figure 2.3. The final model in the total sample showing beta values, R^2 and disturbance terms (dashed line = non significant paths) PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

Description of the Final Model (see table 2.5). For the total sample, 18% of variance in goal efficacy was explained by Map, Pap and Mav; 24% of the variance in goal value by Map and goal efficacy; 31% of variance in planning/monitoring by Map, Mav and goal value; 19% of variance in social comparison by Pap; 23% of variance in self-reward by planning/monitoring, social comparison and goal efficacy; and .47% of variance in self-criticism by Mav, goal efficacy, planning/monitoring, and social comparison. Standardised path coefficients with values greater than .50 indicate a ‘large’ effect, values around .30 a ‘medium’ effect and those less than .10 indicate a ‘small’ effect (Kline, 1998). All significant effects in the model were of moderate size: five paths coefficients had values between .15 and .25 (small to moderate) – Mav to planning/monitoring, goal efficacy to reward and criticism, Pap to efficacy and planning/monitoring to criticism; and eleven paths had values between .28 and .41 (moderate) – Map and Mav to efficacy, Map and efficacy to value, Map and value to planning/monitoring, Pap to social comparison, Mav, planning/monitoring and social comparison to criticism, and planning/monitoring to reward.

Moderation Effects of Goal Difficulty/Specificity. The next question addressed was the extent to which the model identified in the total sample was invariant with respect to goal difficulty/specificity (easy/vague goals in sample 1, and difficult/specific goals in sample 2). Good fit indices were found: in each sample (sample 1/2 ML-Robust: NNFI = .95/.96; CFI = .95/.96; RMSEA = .05/.04; 90%CI = .04/.03 – .05); in the unconstrained /baseline multi-sample model (model 1 ML-Robust: NNFI = .95; CFI = .96; RMSEA = .04; 90%CI = .04 – .05); and in the constrained models 2, 3 and 4 (constraints on factor loadings, factor variances and covariances, and regression paths) (models 2, 3, and 4 ML-Robust: NNFI = .95; CFI = .96; RMSEA = .04; 90%CI = .04 – .05). Model fit indices in the three constrained models were identical to the baseline model, and Δ CFI smaller than .01 supported the model invariance in respect to goal difficulty/specificity. Additionally, a non-significant Δ $s\text{-}B\chi^2$ (Δ $s\text{-}B\chi^2_{(40)} = 46.77$, $p > .05$) also indicated that the moderation effect of goal difficulty/specificity was not supported. The standardized path coefficients for the unconstrained/baseline and constrained multi-sample models 1 and 4 are presented in table 2.5.

Table 2.5. Standardized path coefficients and R² values for all models

Paths	Total Sample Hypothesised Model		Total Sample Final Model		Multi-sample (1/2) Baseline Model 1		Multi-sample (1/2) Constrained Model 4	
	Standardized Coefficients	R ²	Standardized Coefficients	R ²	Standardized Coefficients	R ²	Standardized Coefficients	R ²
To Goal Efficacy from		.17		.18		.24/.14		.19/.18
Performance-Approach	.21		.21		.18/.24		.21	
Mastery-Approach	.31		.31		.37/.26		.32	
Mastery-Avoidance	-.33		-.36		-.42/-.28		-.36	
To Goal Value from		.24		.24		.26/.24		.19/.30
Goal Efficacy	.31		.28		.30/.24		.26	
Mastery-Approach	.33		.34		.34/.38		.33	
To Planning/Monitoring		.31		.31		.35/.29		.32/.30
Goal Value	.32		.34		.32/.33		.35	
Mastery-Approach	.35		.35		.41/.34		.38	
Mastery-Avoidance	-.11		-.15		-.21/-.08		-.16	
To Social Comparison		.19		.19		.25/.12		.26/.11
Performance-Approach	.41		.41		.50/.35		.42	
Performance-Avoidance	.11		.10		-		-	
To Self-Reward from		.21		.23		.30/.18		.26/.22
Planning/Monitoring	.36		.30		.34/.28		.31	
Social Comparison	.28		.28		.34/.19		.30	
Goal Efficacy	-		.17		.13/.20		.17	
To Self-Criticism from		.24		.47		.46/.49		.46/.48
Planning/Monitoring	.20		.25		.29/.18		.23	
Social Comparison	.44		.40		.43/.36		.41	
Goal Efficacy	-		-.22		-.19/-.31		-.22	
Mastery-Avoidance	-		.40		.38/.45		.40	

All path coefficients greater than .10 are significant $p < .01$

Further insight into the invariance of model paths comes from the LM test statistics (model 4) which showed a significant univariate χ^2 incremental value if one constraint was released (the path between Pap and social comparison). After releasing this constraint the model fit indices remained unchanged (model 5 ML-Robust: NNFI = .95; CFI = .96; RMSEA = .04; 90%CI = .04 – .05), but the beta path coefficient from Pap to social comparison was lower in sample 2 (when difficult/specific goals were set; beta = .32) than in sample 1 (when easy/vague goals were set; beta = .43). Although these beta values appear to indicate that goal difficulty moderates/attenuates the relations between Pap and social comparison this evidence is weak when set against the strong evidence of model invariance based on Δ CFI and $\Delta_{S-B}\chi^2$ (Δ CFI < .01 and $\Delta_{S-B}\chi^2_{(39)} = 33.16, p > .05$).

2.4. Discussion

This study addressed calls from the literature to integrate achievement goals (the ‘why’ of motivation) with SR processes (the ‘how’ of motivation) (e.g. Fryer & Elliot, 2008; Kaplan & Maehr, 2002), and attempted to fill existing gaps in both bodies of work in the academic domain. Using SEM analyses, this study focused on the patterns of SR strategies engendered by achievement goals, and the role played in these relations by personal goal attributes – efficacy, value and difficulty/specificity; a comprehensive model including all these variables has not been tested before in academic settings. The results generally supported the hypothesised links and revealed that: each achievement goal had a unique pattern of relations with SR – approach goals were differentially related to SR strategies, while Mav and Pav induced little and no SR activity respectively; achievement goal effects were mediated by personal goal efficacy and value, and were moderated (attenuated) by goal difficulty/specificity; and university students set mostly performance-outcome goals.

Achievement Goals and Self-Regulation Strategies

Pap goal had a direct positive relation with social comparison, while Map goal was unrelated to it. Students with Pap goals who focus on demonstrating competence in comparison with others, engage in social comparison in order to monitor and evaluate their goal progress. These results support the notion that the use of social comparison (the tendency to search for information about the self through others) is a central component of Pap goal regulation both as an overall purpose or aim of demonstrating normative competence as well as an intentional SR process of monitoring goal progress through normative comparison. Therefore, the results support the theoretical conceptualization of Pap and provide confirmation, for the first time, that the action or the ‘how’ of Pap goal is congruent with their reason or the ‘why’. Moreover, the results partly support findings from field and experimental studies showing that both Pap and Map goals were positively linked to students’ broad social comparison orientation (Darnon, Dompnier, Gillieron & Butera, 2010, study 1; Regner, Escribe & Dupeyrat, 2007) and their interest in comparative information post task-engagement (Butler, 1992, 1993, 1995). These relations were explained in terms of multiple goal pursuits (i.e. Map in the

service of Pap) (Darnon et al., 2010) and different purposes of social comparison (to learn from others and/or to maintain a favourable self-image) (Butler, 1992, 1993, 1995).

Map goal had direct positive relations with planning and self-monitoring, and both approach goals had indirect relations through efficacy and value. The adoption of a mastery reason for involvement on its own or through its positive independent effects on perceptions of goal efficacy and value can generate the motivational energy necessary for systematic engagement in planning and monitoring of goal progress. On the other hand, a focus on outperforming others seems to generate little involvement in planning and self-monitoring due to its weak impact on goal efficacy (i.e. little confidence that goal standards in the service of Pap are attainable). These results support previous findings with undergraduate and school students which showed approach goals to have: direct links to planning, self-monitoring, and self-evaluation in essay writing (Kaplan et al., 2009), metacognition and disorganisation (e.g. Bartels & Megun-Jackson, 2009; Braten et al., 2004; Howell & Watson, 2004), and indirect links through self-efficacy to SR (Bandalos et al., 2003; Coutinho & Neuman, 2008) and through value to intrinsic motivation and performance (Hulleman et al., 2008).

Both approach goals had indirect relations with self-consequating through progress monitoring strategies and self-efficacy. For students who anticipate success, an awareness of goal progress, prompts efforts to maintain or enhance motivation through self-reward and self-criticism. Moreover, Map students with a strong sense of goal efficacy were more likely to perceive and reward satisfactory progress and less likely to dwell on and criticize lack of progress than Pap students. These results support previous studies reporting approach goals' associations with positive self-consequating (self-praise; self-reward) (Kaplan et al., 2009; Wolters & Rosenthal, 2000), and theoretical predictions that Map should fostered more resilience in the face of unsatisfactory progress than Pap goals due to a belief in the flexible nature of ability and perceptions of setbacks as opportunities for learning (Ames & Archers, 1988; Dweck & Leggett, 1988).

Mav goal had positive direct relations with self-criticism and negative indirect relations with planning and self-monitoring through low efficacy and value. A focus on avoiding self-

referenced failure seems to discourage planning and self-monitoring, and to generate negative affect followed by self-criticism; this pattern of SR appears to be strengthened by perceptions of low goal efficacy and value. When students fear failure to learn and understand the material fully they lack confidence in their ability to achieve personal goals, anticipate failure and blame themselves. The negative affect generated by Mav goals appears to promote self-criticism even in the absence of objective feedback based on progress monitoring and evaluation. Similarly, Fishbach & Finkelstein (2012) noted that ‘affect or feelings provide feedback for self-regulation even when they are not triggered by performance feedback’ (p. 207). In agreement with the current findings, Coutinho and Neuman (2008) reported an indirect negative relation between Mav and metacognitive regulation through low self-efficacy, while other studies found null relations with self-efficacy and metacognition, and positive relations with disorganisation and procrastination (Bartels & Megun-Jackson, 2009; Howell & Watson, 2007; Malka & Covington, 2005).

Pav goal was not linked in this study to any adaptive SR strategies or to goal efficacy and value. These findings are not surprising since planning, progress monitoring and motivational control strategies investigated in this study represent an organized, systematic approach to goal pursuit, and previous studies showed that students who avoid demonstrating normative incompetence had a disorganized learning style (e.g. Elliot et al., 1999; Howell & Watson, 2007; Senko & Miles, 2008), low efficacy (Middleton & Midgley, 1997; Pajares, Britner, & Valiante, 2000) and were unlikely to use metacognitive strategies that foster deep understanding of material (Schmidt & Ford, 2003). Similar to our findings, some studies reported Pav goals to be unrelated to self-efficacy, perceived competence and metacognitive regulation (Braten et al., 2004; Howell & Watson, 2004; Senko & Miles, 2008).

Theoretical and Practical Implications

Achievement Goal Theory. In line with the contemporary achievement goal theory both the valence and the definition of achievement goals have important implications for SR activity. The current findings support the view that the approach-avoidance distinction of achievement motivation represents a useful conceptual lens through which the structure and function of SR

can be understood (Elliot, 2006). Approach goals focus on success, and this positive hub of SR activity evokes and sustains hope, eagerness and excitement (Peckrun, Elliot, & Maier, 2006; 2009), and, as shown in this study, promoted two patterns of SR; specifically, a focus on mastery is more likely to lead to planning, self-monitoring, and self-reward, while a focus on outperforming others is more like to lead to social comparison and self-criticism. On the other hand, avoidance goals focus on failure, and this negative hub of SR activity evokes and perpetuates threat, anxiety, distractions, rumination, reduced cognitive flexibility (Elliot & Harackiewicz, 1996; Pekrun et al., 2006; 2009), and sensitivity to negative information and events (Elliot, Gable, & Mapes, 2006; Idson, Liberman & Higgins, 2000). These inimical experiences and processes fostered by avoidance goals undermine perceived goal progress (Elliot & Sheldon, 1997; Elliot, Sheldon, & Church, 1997) and, as shown in this study, discourage an organized, systematic approach to SR.

Achievement Goals and Personal Goals. Personal goal characteristics (e.g. goal efficacy, value, difficulty, specificity), usually the focus of the goal setting literature, are rarely investigated within the achievement goal and SR literatures (Kozlowski & Bell, 2006; Seijts et al., 2004). Three personal goal attributes were the focus of this study: efficacy, value, combined difficulty/specificity and type. In line with the original achievement goal theory, goal efficacy (alone or combined with goal value) appears to play an important intervening role in the SR activity promoted by approach and Mav goals. Therefore, the present findings lend support to recommendations made by others (e.g. Bouffard et al., 2005; Harackiewicz & Sansone, 1991) to address the role of value as well as efficacy within the contemporary achievement goal theory.

About half of the students in this study set easy and vague (mastery and performance) goals, while the other half set difficult and mainly specific (performance) goals. Simultaneous SEM analyses carried out with these groups revealed that goal difficulty/specificity was not a moderator of achievement goal relations with SR processes (i.e. the links between achievement goals and SR were similar in the presence of easy/vague and difficulty/specific self-set standards). In contrast, two experimental studies reported that the combined difficulty and specificity attributes of goals, not the type (mastery versus performance) moderated goal

effects on performance (i.e. puzzle games, computer simulations) (Seijts et al., 2004; Senko & Harackiewicz, 2005a). It seems that difficulty and specificity attributes can moderate achievement goal relations with some types of performance, but not the links to SR processes.

Finally, as reported elsewhere, students in this study did not set avoidance goals and comparative or appearance performance goals (e.g. Horowitz, 2010; Okun et al., 2006; Urdan, 2001; Urdan et al., 1999). Some researchers have argued that students view approach and avoidance goals as being the same (i.e. concern of performing worse than others is indistinguishable from the desire to perform better than others) (Roeser, 2004; Urdan & Mestas, 2006). Others have argued that researchers overestimate the natural occurrence of performance (and mastery) goals in classrooms because students rarely think in these terms unless prompted by questionnaires; when free to set their own goals, they tend to mention other concerns such as getting good grades (e.g. Lemos, 1996; Urdan et al., 1999) or being left alone labelled ‘work-avoidance’ or ‘academic alienation’ (Archer, 1994; Nicholls et al., 1985; Nolen, 1988). These inconsistent results led some researchers to question the phenomenological reality or external validity of the four achievement goals measured through questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006).

There are two possible explanations for these mixed findings within the achievement goal literature: the inconsistent definition of performance goals, and the conceptual ambiguity between goals as abstract and concrete aims/standards (the ‘why’ and the ‘what’). First, some researchers include outcome or extrinsic goals such as grades in the definition of performance goals (e.g. Brophy, 2005; Horowitz, 2010; Okun et al., 2006), while others argue that grades are ‘neutral’ goals in terms of competence definition as they can be used as both mastery and performance standards (Grant & Dweck, 2003; Hulleman et al., 2010). Secondly, within the definition of achievement goal orientations the abstract reason and aim/standard constructs overlap, though both tap into the ‘why’ of engagement; goal are also defined as aims or standards in the goal setting literature (Locke & Latham, 2002), but they tap into the concrete goal content or the ‘what’ of engagement. When Elliot narrowed down the definition of achievement goals to ‘aim/standard only’, divorced from the reason or meaning of achievement (e.g. Elliot & Thrash, 2001), a conceptual overlap and confusion was created

between abstract achievement goals/aims (the why) investigated through AGQ, and the concrete personal goals (the what) adopted in the goal setting literature (Roberts, Treasure, & Conroy, 2007) and in qualitative studies of personal goal contents (as achievement goals). Therefore by separating the ‘why’ and ‘what’ researchers could avoid talking across each other about ‘apples and oranges’ (Maehr & Zusho, 2009).

Recently, Elliot, Murayama and Pekrun (2011) made this important distinction between concrete/low-level aims as *standards* and abstract/high-level aims as *reasons* and recommended the integrated study of these constructs as the reason-standard complex: standard (the what) used in the service or reason (the why) (i.e. standards provide the concrete means for measuring the attainment of abstract reasons). This hierarchical and integrated conceptualisation of reasons and standards brings the flexibility of SR into bold relief: the same achievement goal (reason) can be evaluated through different types of personal goals (standards) (e.g. abstract performance-comparative reasons could be channelled through outcome, process, mastery and comparative standards), and the same personal goal standard can be used in the service of different achievement reasons or purposes (e.g. outcome goals in the service of mastery or performance approach as well as avoidance goals). Finally, the reason-standard complex represents a valuable theoretical framework for integrating achievement goals and goal setting paradigms of research and for investigating personal goal attributes as mechanisms in achievement goals’ relations to SR.

Self-Regulation Model. This study makes a significant contribution to our understanding of the ‘why’ ‘what’ and ‘how’ of goal regulation by integrating three distinct areas of research – achievement goals, personal goal attributes and SR of goal progress into one model. Social-cognitive SR models (e.g. Pintrich, 2000; Zimmerman, 2000) emphasise the importance of several motivational beliefs in the SR process, but no studies to date have investigated the interactive effects of four achievement goals, and perceptions of personal goal efficacy and value on the SR strategies used by university students. The few existing studies employed omnibus measures of metacognition (including planning monitoring, evaluation and control), focused on one facet of motivational self-consequating (i.e. self-reward), and did not explore monitoring through social comparison. Additionally, there is no literature on how personal

goal attributes (e.g. difficulty, specificity, efficacy and value) influence goal pursuit processes. Therefore, this study consolidates and extends our understanding of the ‘why’, ‘what’ and ‘how’ of goal regulation by highlighting the importance of investigating: the interactive effects of achievement goals and personal goal attributes on goal striving processes; motivation control in addition to metacognitive regulation strategies; and monitoring/evaluation in relation to multiple standards. Future SR research in academic settings should investigate additional goal characteristics (e.g. type, temporality) as mediators or moderators of achievement goal effects, separate measures of metacognitive regulation (e.g. planning, monitoring and control) and a broader range of motivational regulation strategies (e.g. mastery and performance goal self-induction, interest enhancement, self-efficacy control; Wolters, Pintrich & Karabenick, 2005).

A major concern for university educators is to ensure that students do well, progress through the course and eventually graduate (Tuckman, 2003). There is extensive evidence that academic success is closely linked to students’ motivation and SRL (Eccles, 2005; Chemers, Hu & Garcia, 2001; Zimmerman & Schunk, 2008). Moreover, students’ motivation and SRL skills are amenable to change through interventions (Tuckman, 2003). The present study showed that different purposes of engagement in education are related to different patterns of SR activity. Therefore, educators should be aware that one-size-fits-all SR interventions may not be effective for some students (i.e. those with high Pap/low Map and high avoidance / low approach motivation profiles) and that interventions should target both motivational beliefs (i.e. the meaning and causes of success, confidence in personal ability and the value of learning) as well as metacognitive and motivational SR skills.

Limitations

Although the present study provided new insights into the relations between achievement goals, personal goal attributes, and SR processes, there are several limitations that should be considered. First, the correlational design employed in this study is a limitation because the concurrent collection of data does not allow causal or bi-directional interpretations of relations between model variables. The assumption that goals influence SR strategy use was based on

the conceptualisation of achievement goals as broad cognitive frameworks (Elliot, 2005); however, SR models allow for cyclical and bi-directional links between model components (Pintrich, 2000a). Future research should employ longitudinal designs which allow for the examination of causal links between the model variables. Second, the generalisation of the current findings is limited to university students on Sport and Exercise Science degrees and the moderately competitive context of British higher education where evaluations are based on criterion grading. Future research should test the goal-strategy model in pre-university education, competitive university settings which employ normative curve grading, other university programmes, and collectivistic cultures. Third, the motivational climate, an important moderator of achievement goal effects, has not been investigated in this study. Its inclusion in future research is highly recommended in light of some evidence that SR activity is influenced by the interaction between personal and situational goals (Ommundsen, 2006; Theodosiou & Papaioannou, 2006).

Conclusion

The current study provided support for the argument that students' reasons, standards, and action strategies are integrated in the meaning they construct for academic engagement. Therefore, achievement goal theory should engage in dialogue with allied areas of research (Kaplan & Maehr, 2007), such as goal setting and SR, in order to become a comprehensive goal-action regulation model capable of explaining the 'why', 'what' and 'how' of action. The fit between achievement goals, personal goal attributes and specific SR strategies may depend on contextual affordances affected by task characteristics and instructional practices (e.g. Kaplan et al., 2009). Still, little is known about the generalization of SR models across domains (Wolters et al., 2011): some studies provided support across academic subjects (Wolters, Yu, & Pintrich, 1996; Wolters & Pintrich, 1998), while others did not (VanderStoep, Pintrich, & Fagerlin, 1996). Future research should investigate the generalisation of the goal-strategy model identified in this study to non-academic domains, such as sport and exercise settings.

CHAPTER 3. Study 2.

Integrating achievement goals and self-regulation processes in two physical activity settings: A structural equations model

3.1. Introduction

A good deal is known about the ‘whys’ or energizing factors of behaviour, but not enough about how motivation is maintained (Wolters, Benzion & Arroyo-Giner, 2011). The motivation of physical activity participants is expected to ebb and flow as competing alternative activities appear along the way. Hence, an important question is what athletes and exercisers do to maintain high levels of motivation. Achievement goal theories focus on how motivation fluctuates as a function of personal and situational goals, while self-regulation models focus on how individuals come to purposefully control their own motivation, cognition and behaviour (Pintrich, 2000a; 2004). Therefore, motivation and self-regulation (SR) are intimately linked and an integration of achievement goal theory and SR models would be beneficial to both areas (Fryer & Elliot, 2008; Kaplan & Maehr, 2002).

Contemporary motivation research tends to emphasize the distinctiveness of students’ motivational orientations across different domains. Motivation is often viewed as domain specific (Bandura, 1997; Eccles, 2005; Roberts, Abrahamsen & Lemyre, 2009). For example, individuals’ achievement goals, self-efficacy, and value may vary in education, sport and exercise domains. SR has also been portrayed as a domain specific process as it depends on contextual opportunities for choice and control (e.g. Wolters & Pintrich, 1998). According to social-cognitive theories of motivation and SR models the effects of motivation on SR are moderated by environmental affordances and impedances, therefore patterns of interrelations among motivational constructs and SR processes observed in one domain (e.g. education) may or may not emerge in another (e.g. sport or exercise). Competition is an inherent feature of the sport environment, and winning is the ultimate goal; on the other hand, the exercise environment is essentially non-competitive, the ultimate goal being personal improvement. This study aimed to test the extent to which the model of achievement motivation and SR processes identified in the academic domain (study 1) can be generalized to the sport and

exercise domains. Next, a brief review of achievement goals and SR research in the physical activity domain is presented, highlighting the gaps in both literatures and the need for their integration.

Achievement Goals

The central tenet of achievement goal theory is that achievement behaviour is a function of achievement goals which emanate from the personal meaning individuals assign to perceived success and failure (Ames, 1992; Dweck, 1999; Maehr & Braskamp, 1986; Nicholls, 1984, 1989). Achievement goals define an integrated pattern of beliefs, attributions and affect that underpins different approach and avoidance strategies, different levels of engagement, and different responses to achievement outcomes (Kaplan & Maehr, 1999). The experiences associated with these goals are held to be qualitatively different (Ames, 1992; Dweck, 1999; Dweck & Leggett, 1988): a mastery goal orients individuals towards the development of potential, a focus on personal improvement, learning and mastery of the task, the value of effort and strategies in the quest for personal excellence; a performance goal orients individuals towards demonstrating a superior ability, winning or outperforming others, and the strategic use of effort.

A systematic literature review of goal correlates including articles published between 1990 and 2000 carried out by Biddle, Wang, Kavussanu and Spray (2003) identified 98 studies using the dichotomous goal model in physical activity settings; their findings showed mixed support for the predictions of achievement goal theory: most (but not all) task/mastery orientation correlates supported the theory, whereas ego/performance orientation correlates were less consistent with the theory. In the late 1990s, the approach-avoidance distinction was introduced in the achievement goals literature (e.g. Elliot & Church, 1997) partly as a way of explaining the mixed findings related to performance goals (ego orientation). This development generated a lot of research activity in education, but less so in the physical activity domain (Wang, Biddle & Elliot, 2007). A review including articles published until the end of 2009 identified 33 studies using the three and four goal models in sport and physical education (Papaioannou, Zourbanos, Krommidas & Ampatzoglou, 2012). Although

the findings reported by Papaioannou et al. (2012) generally supported the predictions of these models, it seems performance-approach goals continue to generate mixed outcomes even when separated from performance-avoidance goals. *Therefore, this study aimed to investigate both approach and avoidance goals.*

One reason for these mixed patterns of results concerning performance goals could be the failure to consider the intervening role of perceived competence. A critical component of achievement goal theory, perceived competence is assumed to moderate the effect of ego/performance goal on achievement striving, in that adaptive strivings result only when perceptions of competence are high (Nicholls, 1989). Few studies have investigated this theoretical tenet. Indeed, Biddle et al. (2003) remarked that the ‘associations between task and ego goal orientations and perceived competence [...] are often not the central focus of research studies and therefore not regularly reported’ (p. 6). Based on Nicholls’ theory (1989), two different interpretations of the role of perceived competence have existed in the literature – moderator versus mediator: the moderating effects reported across studies were mixed (e.g. Cury, Biddle, Sarrazin, & Famose, 1997; Gill & Williams, 2008; Li, Shen, Rukavina & Sun, 2011; Ommundsen & Pedersen, 1999; Standage, Duda & Ntoumanis, 2003; Vlachopoulos & Biddle, 1997; Whitehead, Andree & Lee, 2004), while mediation effects were reported consistently (Biddle, Soos, & Chatz, 1999; Li, Shen, Rukavina, & Sun, 2011; Lintunen, Valkonen, Leskinen, & Biddle, 1999; Sproule, Wang, Morgan, McNeal & McMorris, 2007). Clearly, the interaction between achievement goals and perceived competence is in need of further research (Kingston, Harwood & Spray, 2006); therefore, *this study aimed to investigate the intervening role of competence perceptions in the achievement goal effects on SR processes.*

A second possible reason for the mixed pattern of findings in the goal literature could be the failure to account for the role of achievement value. The concept of value, which reflects the importance an individual places on the pursuit of competence, is an underexplored area of contemporary achievement goal theory (Elliot, 1997). A few studies in the physical activity domain identified task value or competence valuation as a mediator of goal effects on outcomes such as satisfaction, investment in learning, intrinsic motivation and performance

(Cury, Da Fonseca, Rufo, Peres & Sarrazin, 2003; Cury, Elliot, Sarrazin, Da Fonseca & Rufo, 2002; Elliot, Cury, Fryer, & Huguet, 2006; Hulleman, Durik, Schweigert & Harackiewicz, 2008). *The present study aimed to extend this line of research by investigating the intervening role of value in the achievement goal relations with SR processes.*

Since the partition of achievement goals into approach and avoidance types, the phenomenological reality of avoidance goals has been questioned both in education and physical activity domains. Some researchers have argued that students and athletes view approach and avoidance goals as being the same (Ciani & Sheldon, 2010; Kaplan, Lichtinger & Gorodetsky, 2009; Urdan & Mestas, 2006). For example, eight elite athletes misinterpreted mastery-avoidance as mastery approach goals (Ciani & Sheldon, 2010). Others have argued that researchers overestimate the natural occurrence of avoidance goals in education (e.g. Horowitz, 2010; Okun, Fairhome, Karoly, Ruehlman, & Newton, 2006, study 1) and physical education (Sideridis & Mouratidis, 2008). For example, Sideridis and Mouratidis (2008) reported that only 14 out of nearly 400 elementary and middle school students selected mastery avoidance as their primary goal in physical education classes. As qualitative studies have questioned the external validity of nomothetic goal measures, *this study aimed to identify athletes and exercisers' self-set goals and to classify them along the approach-avoidance and mastery-performance dimensions.*

In conclusion, the literature based on the achievement goal theory in the physical activity domain can be summarized as follows: 1) mastery approach goal (Map) had consistently adaptive outcomes; 2) performance-approach goal (Pap) had both adaptive and maladaptive outcomes, and the intervening role of perceived competence and task value in these relations is not clear at present; 3) there is less research on performance and mastery avoidance goals (Pav, Mav) than on approach goals, and this body of research showed links to maladaptive outcomes; and 4) the prevalence of avoidance goals was brought into question. *Therefore the aim of this study was to investigate, in two physical activity settings, the role played by perceived competence and value in achievement goal relations with SR processes, and to explore the nature of authentic goals set by athletes and exercisers.*

Self-Regulation

A social cognitive perspective regarding the acquisition of athletic competence focuses on the role of learners' social and SR processes during extensive practice (Zimmerman & Kitsantas, 2005). SR is defined as the specific self-initiated personal, behavioural, and environmental processes designed to attain personal goals cyclically (Zimmerman & Kitsantas, 2005). Peak performance in sport usually requires 10 years of deliberate practice (i.e. a set of systematic, self-directed, and self-motivated behaviours aimed at achieving a specific goal) (Ericsson, 2007). In order to engage in effective practice over long periods of time, athletes must be highly self-disciplined and self-regulated (Crews, Lochbaum, & Karoly, 2001). SR research is critical in both sport and exercise since SR underlies the effectiveness of every strategy used to enhance performance and sustain exercise participation (Crews, 1992).

Several SR models employed in the physical activity domain (Bandura 1986, 1997; 2001; Kirschenbaum, 1987, 1997; Locke & Latham, 1990) highlight the importance of SR processes or strategies such as goal setting, self-monitoring, self-evaluation and self-reinforcement. *Goals* are defined as standards of performance that individuals are strategically, and consciously trying to accomplish (Schunk, Pintrich, & Meece, 2008), and commitment to personal goals is a pivotal yet underexplored component of the SR process (Burton, Naylor & Holliday 2001; Kirschenbaum, 1997). Athletes are committed to their goals when they perceive them to be important and attainable (Locke, 1996; Wigfield, Tonks & Eccles, 2004), therefore, goal value and goal efficacy are important determinants of goal pursuit efforts. *Planning* refers to creating or selecting courses of action likely to produce desired outcomes and avoid detrimental ones; *self-monitoring* involves observing and tracking one's performance for the purpose of improved awareness of actions and processes that hinder or facilitate an athlete's progress towards a goal; *self-evaluation* involves comparing one's current level of performance with the goal, thus establishing the extent of progress made; and *self-consequating* involves administering consequences (rewards or punishments) depending on the outcomes of monitoring and evaluation. Self-rewards reflect personally directed positive feedback, indicate satisfaction with goal progress and suggest maintaining the existing plan of action. In contrast, self-punishment reflects negative feedback, indicates dissatisfaction

with goal progress and suggests the need to modify existing action plans. Several studies have demonstrated the positive effects of SR on learning and performance of motor skills (e.g. Anshel & Porter, 1995, 1996; Kirschenbaum, Owens & O'Connor, 1998; Kitsantas & Zimmerman, 2006; Polaha, Allen & Studley, 2004; Zimmerman & Kitsantas, 1996) and exercise participation (Karoly, Ruehlman, Okun & Lutz, 2005; Lutz, Karoly & Okun, 2008; Macdonald & Palfai, 2008).

According to a literature review of 34 studies published in the 1990s (Crews, Lochbaum, & Karoly, 2001) the use of the term SR betrayed a lack of conceptual clarity and systematic operationalization. It appears that SR was not differentiated from constructs such as goal orientations, self-efficacy or intrinsic motivation; that is subjective control through beliefs and perceptions was not distinguished from an active, intentional control of motivational processes (Boekaerts, 1992; Wolters, 2003). The wide variety of theories and measures identified in this review indicates that SR was used as an umbrella term rather than a set of strategies or processes (Crews et al., 2001). Much of this research was not based on a SR paradigm and had not conceptualised motivational beliefs as components that can be regulated. Crews et al. (2001) concluded that 'the field is in need of a more systematic, unifying approach to the study of self-regulation' (p. 578).

Focusing on the mental skills training literature, Gould and Chung (2004) concluded that most SR research fall into two categories: micro or short-term versus macro or long-term studies. Most studies were micro-level studies which focused on the process of improving performance on specific tasks of short duration using self-control strategies (e.g. goal-setting, imagery, self-talk, and stress management techniques) (e.g. Hill & Borden 1995; Kavussanu, Crews & Gill, 1998; Prapavessis, Grove, McNair & Cable, 1992; Zimmerman & Kitsantas, 1996). The macro-level studies focused on using behavioural strategies to achieving more general goals over an extended period of time (e.g. being successful in sport, winning a tournament), and there were fewer studies in this category (e.g. Kane, Baltes & Moss, 2001; Kirschenbaum et al., 1998; Gorley & Gordon, 1995). The majority of short- and long-term studies showed that SR strategies improve sport performance and exercise adherence. However, an important limitation of this literature is the almost exclusive focus on the development of SR skills and

the effectiveness of such interventions, and less on the extent to which athletes and exercisers engage in regular, systematic and self-initiated use of SR strategies. Indeed there is some evidence that athletes fail to use mental skills systematically (Vealey, 2007). *Therefore, the present study aimed to extend this line of research by investigating the habitual use of SR strategies in the service of semester-long goals.*

Achievement Goals and Self-Regulation

In the physical activity domain, there is limited research investigating achievement goals and SR (Kitsantas & Kavussanu, 2012). In three correlational studies only task orientation was a positive predictor of metacognitive strategies (Ommundsen, 2006; Papaioannou, Simou, Kosmidou, Milosis & Tsigilis, 2009; Theodosiou & Papaioannou, 2006), while in two experimental studies, undergraduate student-athletes in the task involving condition used collectively more metacognitive strategies than athletes in the ego-involving condition after perceived failure (Gano-Overway, 2008). In addition to self-referenced standards, athletes and exercisers can monitor and evaluate goal progress in comparison with that of their peers; the use of multiple standards (self and others) can provide useful competence information and can increase persistence and achievement (Elliot, Murayama & Pekrun, 2011; Roberts et al., 2009). Specifically, self-monitoring and social comparison distinguished regular and irregular exercisers, and were positively related to exercise participation (Karoly et al., 2005; Lutz et al., 2008; Macdonald & Palfai, 2008). In education, there is some indirect evidence showing that students' Pap goals were related to broad social comparison orientations (Darnon, Dompnier, Gillerion & Butera, 2010; Regner, Escribe, & Duperyard, 2007) and post-task interest in comparative feedback (Butler, 1992, 1993, 1995), while in physical education, students with high ego orientation and high perceived competence sought comparative feedback and rejected objective task feedback (Cury & Sarrazin, 1998). *This study investigated three metacognitive strategies – planning, self-monitoring and social comparison.*

There is limited research on achievement goals and motivational regulation strategies. Experimental and correlational studies with physical education students showed that Map and Pap were negatively related, and Pav was positively related to self-handicapping (a self-

protective regulatory strategy) (Curry et al., 2003; Elliot et al., 2006; Ommundsen, 2001; 2004; 2006). Additionally, there is some indirect evidence gleaned from mental skills studies: athletes who were moderate-to-high or high in both task and ego orientation engaged more often in motivational imagery associated with skill development and winning, and used more positive self-talk (a form of self-reinforcement) than those with other profiles (Cumming, Hall, Harwood & Gammage, 2002; Harwood, Cumming, & Fletcher, 2004; Harwood, Cumming & Hall, 2003; Van de Pol & Kavussanu, 2011). The scant literature on self-consequating showed positive associations between student's approach goals and their use of self-reward or self-praise (Kaplan et al., 2009; Wolters & Rosenthal, 2000), and self-determination predicted self-reward but not self-criticism in exercise (Lutz, Karloy & Okun, 2008). *This study aimed to investigate two types of motivational self-consequating, self-reward and self-criticism.*

In summary, the scant SR literature in the physical activity domain investigated: mainly sport participants; a narrow range of motivational constructs, particularly approach goals; either metacognitive or maladaptive motivational regulation; only self-monitoring and not social comparison; and no studies focused on achievement goals and self-consequating. *Therefore, this study aimed to investigate a SR model including: 1) the interactive effects of three motivational constructs (approach and avoidance goals, goal efficacy and goal value); 2) both metacognitive and motivational regulation, 3) both self and other-related standards of monitoring/evaluation; 4) motivational regulation through self-consequating; and 5) the nature of self-set goals in two distinct domains (i.e. competitive sport and non-competitive exercise settings).*

Summary and Hypotheses

Drawing on the limitations of achievement goal and SR literatures, this study makes a significant contribution to both fields of study by focusing on the pattern of self-initiated metacognitive and motivational regulation strategies associated with approach and avoidance goals, the role of personal goal efficacy and value in these links, and the nature of goal content in two physical activity domains. A comprehensive model including all these variables has not been tested before in sport or exercise contexts. Furthermore, the separate testing of the

SR model in the sport and exercise settings facilitates an indirect insight into the moderating role of the environment (i.e. competitive versus non-competitive) in the model.

Based on the findings of study 1 in the academic domain, and relevant literature in the physical activity domain, the following relations are hypothesised (see figure 3.1):

1. Pap will have direct positive relations with social comparison and goal efficacy, and indirect positive relations with planning and self-monitoring, through goal efficacy and value.
2. Map will have direct positive relations with goal efficacy, goal value, planning and self-monitoring, and indirect positive relations with planning and self-monitoring through goal efficacy and value.
3. Map and Pap will have indirect positive relations with both self-consequating strategies through goal efficacy, planning and self-monitoring strategies.
4. Mav will have two direct relations, positive with self-criticism and negative with goal efficacy, and two negative indirect relations, one with planning and self-monitoring through goal-efficacy and value, and two with self-consequating strategies through self-efficacy.
5. Pav will have null relations with goal efficacy, goal value and SR strategies.
6. Athletes and exercisers will set only or mostly approach personal goals.

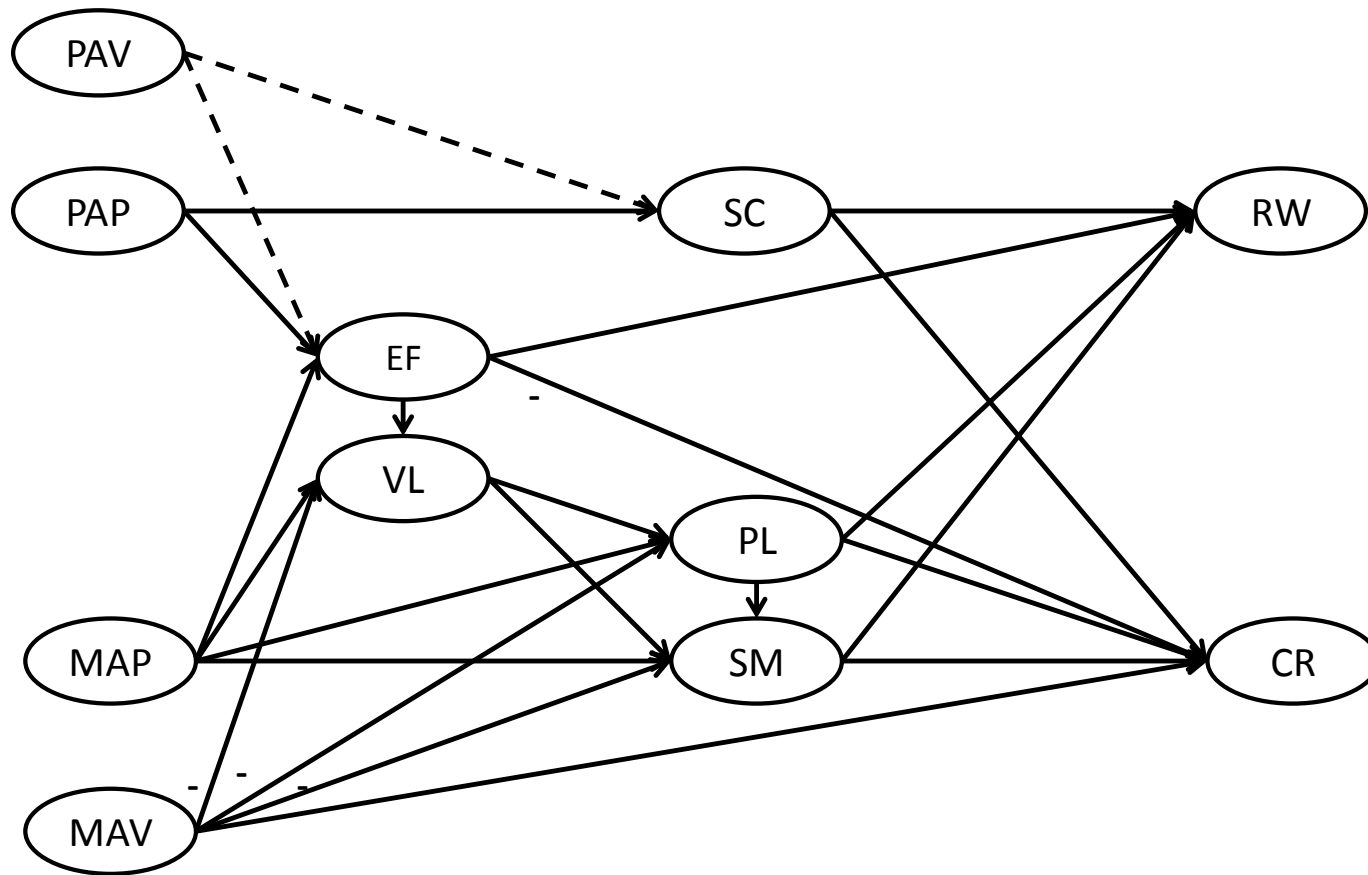


Figure 3.1. Hypothesised sport and exercise model 1 (PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PL – Planning, SM - Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

3.2. Method

Participants and Procedure

Participants in this study were: 294 student-athletes – 162 males (55%) and 132 females (M age = 20.7 years, SD = 1.6), and 288 students who participated in exercise – 157 males (55%) and 131 females (M age = 21.1 years, SD = 1.9). All participants were Caucasians.

Participants independently completed a 10-minute questionnaire pack at the end of a class. They were provided with a brief explanation of the purpose of the study and were assured that their responses would remain confidential. Ethical committee approval for the research procedure, which complied with the guidelines of the British Psychological Society, was received from the relevant institutional body before data collection.

Measures

Achievement Goals. The Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot & Hofer, 2003) was developed to assess sport participants' achievement goals; it comprises 12 items and measures four goals (three items per goal): mastery-approach (e.g. 'It is important to me to perform as well as I possibly can'), mastery-avoidance (e.g. I worry that I may not perform as well as I possibly can'), performance-approach (e.g. 'It is important for me to perform better than others') and performance-avoidance (e.g. 'I just want to avoid worse than others'). The answer scales ranges from 1 (Not at all like me) to 7 (Completely like me) (see appendix 3). The authors reported adequate confirmatory validity and reliability indices with American undergraduate students.

Personal Goal Attributes and Self-Regulation Strategies. Athletes and exercisers identified their most important goal for the current academic semester, and then completed the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) in relation to this goal (see appendix 2). The seven scales (four items each) used in this study measure two personal goal characteristics – goal *value* (e.g. 'This goal is valuable to me') and goal *efficacy* (e.g. 'I have the ability to reach this goal'), and five SR strategies: *planning* refers to planning process

steps, scheduling activities and preventing interference from other goals or people (e.g. ‘I try to plan in advance the steps necessary to reach this goal’), *self-monitoring* refers to the monitoring and evaluation of personal progress, successes, day-to-day behaviour and potential obstacles to progress (e.g. ‘I keep track of my overall progress on this goal’); *social comparison* refers to the monitoring and evaluation of one’s progress in comparison with others of similar ability, who are working on a similar goal, and are doing better or worse than oneself (e.g. ‘I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing better [worse] than I am’); *self-reward* refers to the use of positive reinforcement for satisfactory goal progress and hard work (e.g. ‘I reward myself when I make progress toward this goal’), and *self-criticism*, refers to verbal punishment for unsatisfactory progress or insufficient effort (e.g. I tend to criticize myself when I’m not making progress toward this goal’). Sport and exercise participants were asked to indicate how well each statement described their work on their most important goals on a scale ranging from 0 to 4 (0 = Not at all; 4 = Extremely). Karoly and Ruehlman (1995) reported adequate confirmatory validity, reliability and social desirability indices in the fitness domain.

Data Analyses

Validity and Reliability Analyses. In each sample, the validity of the two questionnaires was tested through exploratory factor analyses (EFAs) with varimax rotation and confirmatory factor analyses (CFAs), while the reliability of all subscales was based on Cronbach alphas. The model fit was evaluated through a combination of comparative or relative goodness of fit indices – derived from comparisons between the hypothesised and independence models, and absolute fit indices – based on how well the hypothesised model fits the sample data (Browne, McCallum, Kim, Andersen & Glaser, 2002). Two relative indices were selected, the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI), and two absolute fit indices, the McDonald Fit Index (MFI) and the Root Mean Square Error of Approximation (RMSEA) with its 90% Confidence Intervals (CI). NNFI and CFI values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fit to the data (McDonald & Marsh, 1990); MFI values greater than .89 represent a well fitted model (Hu & Bentler, 1999). RMSEA values at or less than .05 and .08 are taken to reflect a close and reasonable fit,

respectively (Jöreskog & Sörbom, 1993; Marsh, Bella & Hau, 1996). The chi-square statistic is often misleading due to its sensitivity to sample size (Chou & Bentler, 1999), and it does not directly provide degree of fit compared to other indices that are normed from 0 to 1 (Bagozzi, 1993). Therefore, due to relatively small samples in this study, the ratio between chi-square and degrees of freedom was used as a fit index; a ratio lower than 3 indicates a good fit (Kline, 1998).

The Hypothesized Model. Structural Equations Modelling (SEM) analyses with EQS 6.1 (Bentler & Wu, 2002) were conducted to test the hypothesized model in the two samples. Based on literature recommendations (Fan, Thompson & Wang, 1999; Hu & Bentler, 1998; Marsh, 2007) model fit was evaluated through a combination of relative and absolute goodness-of-fit indices: χ^2/df , NNFI, CFI, RMSEA, and CI90%. Simulation studies showed that NNFI, CFI and RMSEA fit indices were the least influenced by sample size (Fan et al., 1999). Moreover, Hu and Bentler (1998) recommended CFI and RMSEA due to their sensitivity to model misspecification.

Mediational Analyses. Following literature recommendations (Adie, Duda & Ntoumanis, 2008; Holmbeck, 1997), three separate nested models were tested in order to ascertain whether personal goal efficacy and value mediated the relations between three achievement goals (i.e. Map, Pap and Mav) and one SR strategy (i.e. planning/self-monitoring) in each domain. The first model captured the direct hypothesized relations from achievement goals to planning/monitoring; the second model examined the relations from the predictor variables (goals) to the mediators (goal efficacy and value) and from the mediators to the outcome variable (planning/monitoring); the third model tested contained both the indirect paths from model 2 and the significant direct paths from model 1. Full mediation is established if the direct and indirect paths in models 1 and 2 are significant, and the direct paths become non-significant in model 3; if the direct paths remains significant, but the beta coefficients drop in value, partial mediation is established (Baron & Kenny, 1986).

3.3. Results

Preliminary Analyses

Personal Goals Analyses. Two individuals with expertise of the achievement goal theory and goal setting literatures, implemented a coding system to categorise each freely reported goal as: 1) performance outcome, process, and mastery goals (the latter category is referred in the goal setting literature as ‘performance’ goals); and 2) approach or avoidance goals. The inter-coder agreement was 98.6% and disagreements were resolved through discussion. All goals were approach goals. Athletes set: 121 (41%) performance/outcome goals – 69 (23%) were competitive/ranking-related (e.g. ‘win the league’, ‘reach top three’, ‘reach Cup final’) and 52 (18%) were selection-related (e.g. ‘getting into the 1st team’, ‘keep my place in the team’); and 173 (59%) mastery goals – 86 were related to overall performance (e.g. ‘play well’, ‘set PB’, ‘improve as a footballer’, ‘become a better cricketer’) and 87 were process or strategy-related goals (e.g. ‘improve fitness/skills/motivation’, ‘train harder’). All exercise participants set mastery goals: 225 (78%) mastery-improvement goals (e.g. ‘improve fitness / endurance / strength’), and 63 (22%) mastery-process goals (e.g. ‘go to the gym three times a week’).

Descriptive Statistics and Correlations. Descriptive statistics and correlations between all variables in the sport and exercise samples are presented in tables 3.1 and 3.2 respectively.

Validity and Reliability Analyses. EFAs and CFAs on the AGQ-S provided support for the four factor structure for the sport and exercise samples; CFA fit indexes were good according conventional standards (sport/exercise: NNFI = .96/.97; CFI = .97/.98; MFI = .94/.95; RMSEA = .05, 90%CI = .04/.03 – .08/.07; $\chi^2_{S-B}/df = 1.83/1.62$). As in study 1, EFAs on the GSAB extracted six factors (instead of seven): all planning and (the same) two self-monitoring items (i.e. ‘I’m aware of my day-to-day behaviour as I work towards this goal’ and ‘I keep track of my overall progress towards this goal’) loaded on one factor (labelled planning/self-monitoring); the other two self-monitoring items loaded on other factors and were deleted from further analyses. Problems with the self-monitoring scale have been reported before such as low reliability (.63 and .65) and high correlations with planning (.70

Table 3.1. Descriptive statistics, alpha coefficients and correlations for all variables in the sport domain

	N	M	SD	Range	Alpha	1	2	3	4	5	6	7	8	9
1. Performance-Approach	294	4.63	1.46	6.00	.90									
2. Performance-Avoidance	294	3.98	1.59	6.00	.86	.55								
3. Mastery-Approach	294	6.13	0.82	6.00	.80	.19	.01							
4. Mastery-Avoidance	294	5.10	1.30	6.00	.86	.26	.44	.13						
5. Goal Efficacy	294	2.94	0.58	3.25	.82	.19	.05	.21	.09					
6. Goal Value	294	3.17	0.68	4.00	.89	.16	.08	.44	.03	.48				
7. Planning/Monitoring	294	2.19	0.73	4.00	.83	.16	.06	.34	.05	.38	.54			
8. Social Comparison	294	1.80	0.87	4.00	.81	.44	.31	.05	.33	.12	.14	.19		
9. Self-Reward	294	1.99	0.85	4.00	.86	.22	.10	.18	.04	.32	.37	.48	.30	
10. Self-Criticism	294	2.03	0.85	4.00	.81	.22	.21	.15	.46	.08	.24	.33	.47	.27

$r = .12 - .15$ $p < .05$; $r > .18$ $p < .01$

Table 3.2. Descriptive statistics, alpha coefficients and correlations for all variables in the exercise domain

	N	M	SD	Range	Alpha	1	2	3	4	5	6	7	8	9
1. Performance-Approach	287	4.21	1.48	6.00	.90									
2. Performance-Avoidance	287	3.74	1.52	6.00	.84	.61								
3. Mastery-Approach	287	5.86	0.89	5.33	.78	.18	-.06							
4. Mastery-Avoidance	287	5.06	1.27	6.00	.86	.23	.39	.22						
5. Goal Efficacy	288	3.01	0.56	3.25	.81	.02	-.07	.28	-.08					
6. Goal Value	288	3.11	0.62	3.25	.85	.08	-.01	.32	.05	.34				
7. Planning/Monitoring	288	2.23	.067	3.83	.82	.07	-.00	.32	.11	.31	.37			
8. Social Comparison	288	1.40	0.98	4.00	.88	.40	.38	.03	.22	-.05	.07	.27		
9. Self-Reward	288	1.93	0.85	4.00	.88	.03	.04	.07	-.05	.28	.23	.45	.31	
10. Self-Criticism	288	1.94	0.89	4.00	.84	.11	.19	.12	.41	-.01	.25	.33	.38	.20

$r > .17$ $p < .0$

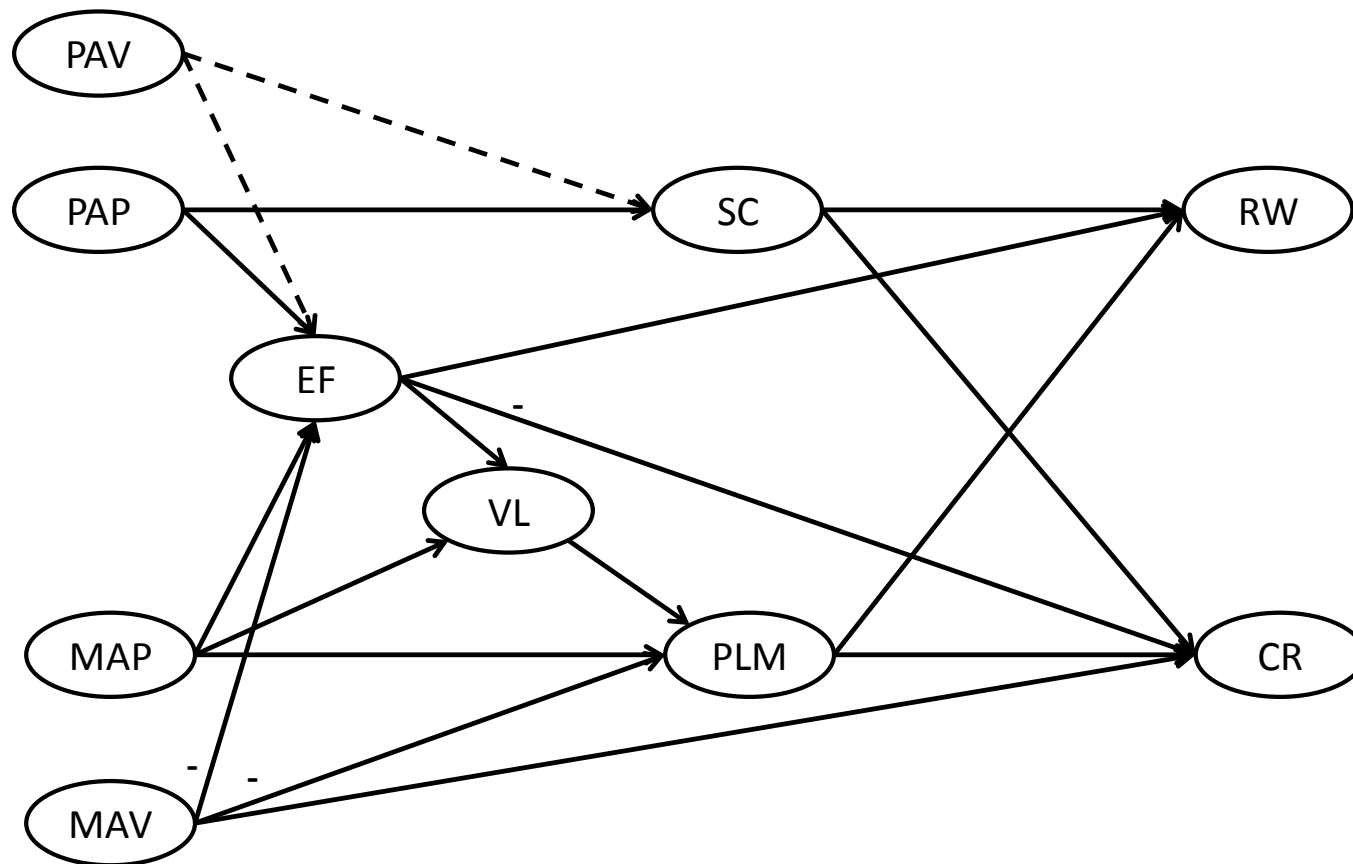


Figure 3.2. Hypothesized sport and exercise model 2 (dashed line - non significant path; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL – Value, PLM – Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

and .72) (Lutz et al., 2008; McDonald & Palfai, 2008). CFAs on the GSAB parcelled items (i.e. three parcels to the planning/monitoring scale and two parcels to the other three scales) provided evidence for the six factor structure in both samples (sport/exercise: NNFI = .97/.98; CFI = .98/.99; MFI = .96/.97; RMSEA = .04/.04, 90%CI = .02/.01 – .06/.06; $s_B \chi^2/df = 1.50/1.36$). The hypothesized model including this new composite measure of planning and self-monitoring is shown in figure 3.2. All scales were found to be reliable with alpha values ranging from .78 to .90 for AGQ-S, and from .81 to .89 for GSAB (see tables 3.1 and 3.2).

Main Analyses

The Hypothesized Model. In the hypothesised sport and exercise models, Mardia coefficients were relatively large (normalized estimates were 26.57 and 21.99, respectively) indicating non-normality in the data. Therefore the robust (i.e. corrected for non-normality) maximum likelihood (ML) estimation method was used to analyse the data. In both samples, SEM analyses revealed good fit indices (sport/exercise; ML-Robust: NNFI = .96/.96; CFI = .97/.96; RMSEA = .04, 90%CI = .03 – .05; $s_B \chi^2/df = 1.43/1.48$). The two models were very similar to the academic domain model (in study 1) and to each other; the standardized path coefficients for both samples are presented in table 3.3. Only three paths were not significant (therefore did not support the research hypotheses), one in both sport and exercise domains (goal efficacy to self-criticism), one in the sport domain (Map to planning/monitoring) and one in the exercise domain (Pap to goal efficacy) (see dashed paths the sport and exercise models in figures 3.3 and 3.4, respectively).

Description of the Final Model. In the sport domain, Map, Pap and Mav explained 12% of variance in *goal efficacy*, while in the exercise domain Map and Mav accounted for 20% of variance in *goal efficacy* (see table 3.3). In the sport and exercise models, Map and goal efficacy explained 51% and 27% of variance in *goal value* respectively. For athletes goal value explained 44% and for exercisers goal value and Map explained 26% of variance in *planning/monitoring*. Pap accounted for 24% and 20% of variance in monitoring through *social comparison* in the sport and exercise domains respectively. Planning/monitoring, social

Table 3.3. Standardized path coefficients and R² values for the sport and exercise models

Paths	Sport Model		Exercise Model	
	Standardized Coefficients	R ²	Standardized Coefficients	R ²
To Goal Efficacy from		.12		.20
Performance-Approach	.23		-.01	
Mastery-Approach	.22		.43	
Mastery-Avoidance	-.21		-.20	
To Goal Value from		.51		.27
Goal Efficacy	.50		.34	
Mastery-Approach	.41		.28	
To Planning/Monitoring		.44		.26
Goal Value	.62		.40	
Mastery-Approach	.08		.18	
Mastery-Avoidance	.02		.04	
To Social Comparison		.24		.20
Performance-Approach	.49		.45	
To Self-Reward from		.37		.30
Planning/Monitoring	.43		.41	
Social Comparison	.27		.26	
Goal Efficacy	.18		.16	
To Self-Criticism from		.51		.35
Planning/Monitoring	.36		.31	
Social Comparison	.40		.26	
Goal Efficacy	-.08		-.08	
Mastery-Avoidance	.40		.38	

All path coefficients greater than .08 are significant $p < .01$

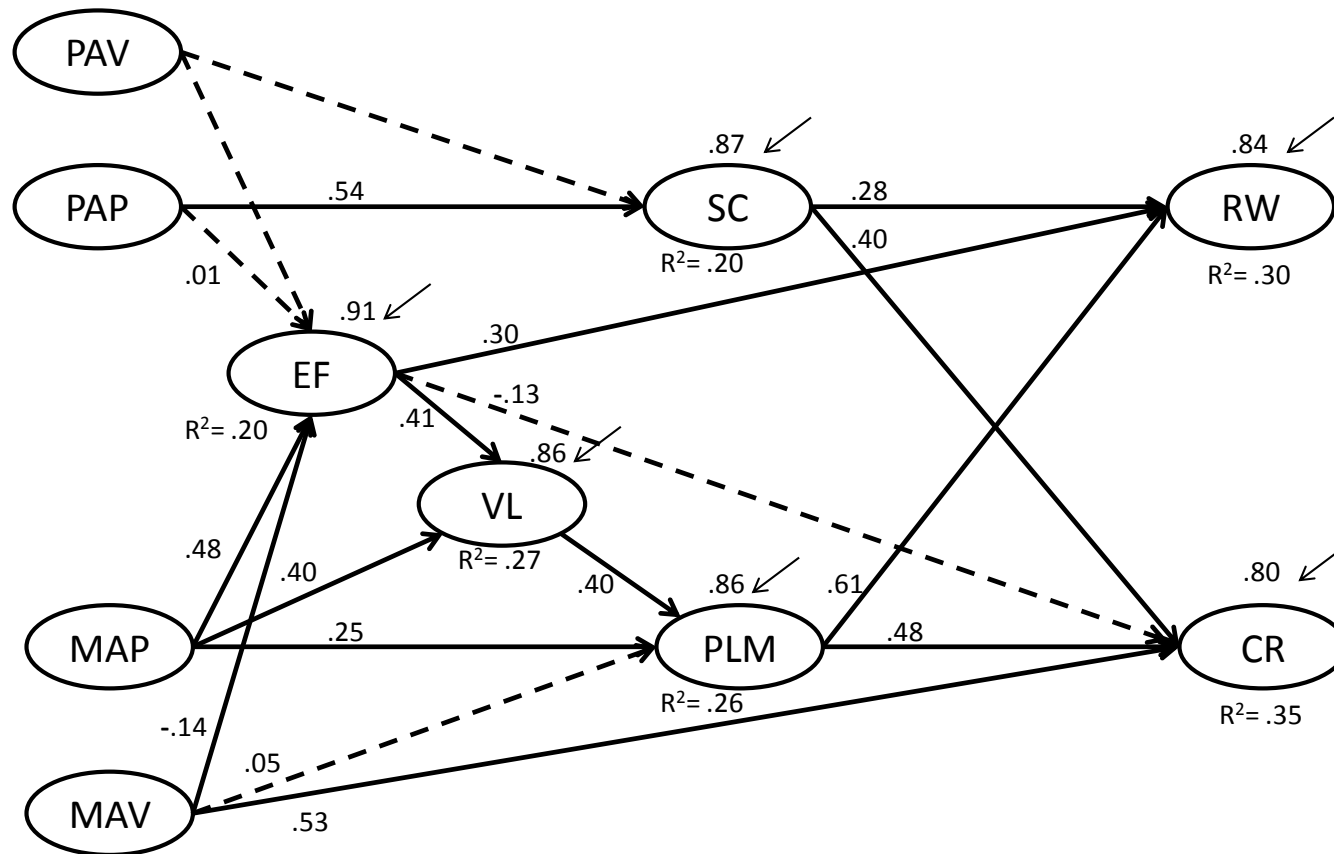


Figure 3.4. The final exercise model showing beta values, R^2 and disturbance terms (dashed line = non-significant paths; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

comparison and goal efficacy explained 37% and 30% of variance in *self-reward* in the sport and exercise domains, respectively. Finally, Mav, planning/monitoring and social comparison accounted for 51% and 35% of variance in *self-criticism* for athletes and exercisers respectively.

Standardized path coefficients with values greater than .50 indicate a ‘large’ effect, values around .30 a ‘medium’ effect and those less than .10 indicate a ‘small’ effect (Kline, 1998). In the sport domain, three paths coefficients had values between .49 and .62 (large effects) – Pap to social comparison, efficacy to value, and value to planning/monitoring; six coefficients indicated medium effects – Map to value, planning/monitoring and social comparison to reward, and Mav, planning/monitoring and social comparison to criticism; finally, three coefficients were small to medium – Pap, Map and Mav to efficacy, and efficacy to reward. In the exercise domain, seven path coefficients had values between .28 and .43 (medium effects) – Map to efficacy, Map and efficacy to value, value to planning/monitoring, Pap to social comparison, Mav to criticism, and planning/monitoring to reward and criticism; and five coefficient had values between .16 and .26 (small to medium effects) – Map to planning/monitoring, Mav to efficacy, efficacy to reward, and social comparison to reward and criticism.

Mediational Effects. In both domains, model 1 showed that only Map had a significant direct path to planning/monitoring, while Pap and Mav did not; therefore further mediation tests focused on the Map goal only (Holmbeck, 1997; Baron & Kenny, 1986). The second model showed significant indirect paths from Map to planning/monitoring through goal efficacy and value in both domains. Finally, in the sport domain, the direct path in model 3 became non-significant, while in the exercise domain the direct path remained significant, but the beta path coefficient dropped from .35 to .23. According to these findings, Map goal’s relation to planning/monitoring is fully and partially mediated by goal efficacy and value in the sport and exercise domains, respectively. Each of the three models produced a good fit to the data in both samples (ML Robust: NNFI \geq .95 CFI \geq .96; RAMSEA \leq .05; 90% CI = .01 - .06; $s_B \chi^2/df < 2$).

3.4. Discussion

This study addressed calls from the literature to integrate achievement goals (the ‘why’ of motivation) with SR processes (the ‘how’ of motivation) (e.g. Fryer & Elliot, 2008; Kaplan & Maehr, 2002), and attempted to fill existing gaps in both bodies of work in the physical activity domain. Using SEM analyses, this study focused on the patterns of SR strategies engendered by achievement goals, and the role played in these relations by personal goal efficacy and value; a comprehensive model including all these variables has not been tested before in sport or exercise settings. Furthermore, this study aimed to evaluate the extent to which the academic model of achievement motivation and SR identified in study 1 generalised to two physical activity contexts (i.e. competitive and non-competitive). The results showed that the sport and exercise models were very similar to each other and to the academic model in study 1; the relations between achievement goals and SR processes appear to be fairly stable across domains. The results generally supported the hypothesised links and revealed that: each achievement goal had a unique pattern of relations with SR – approach goals were differentially related to SR strategies, while *Mav* and *Pav* induced little and no SR activity respectively; goal efficacy and goal value influenced the effects of achievement goals on SR; and all student-athletes and exercise participants set only approach goals.

Achievement Goals and Self-Regulation Strategies

Map had positive relations with planning and self-monitoring, and these links were fully and partially mediated by goal efficacy and value in sport and exercise settings respectively. Athletes and exercisers who focus on mastery and personal improvement tend to engage in planning, monitoring and evaluation of goal progress because they believe their self-set goals are attainable and important. Previous studies reported similar findings: task orientation predicted separate and composite measures of planning, monitoring and evaluation in physical education (Ommundsen, 2006; Papaioannou et al., 2009; Theodosiou & Papaioannou, 2006), perceived competence partially mediated the effects of task orientation on intention to exercise (Biddle, Soos & Chatzisarantis, 1999; Li et al., 2011), and utility value partially mediated the effects of *Map* on football camp satisfaction (Hulleman et al., 2008). Furthermore, studies

with undergraduate students showed that self-efficacy mediated the positive and negative effects of Map on metacognition and disorganisation respectively (Bandalos, Finney & Geske, 2003; Coutinho & Neuman, 2008).

Pap had a direct positive relation with social comparison in both domains, and an indirect positive relation with planning and self-monitoring through goal efficacy and value in sport settings only. In line with theoretical predictions, athletes and exercisers who focus on outperforming others monitor their progress by comparison with their peers; additionally, athletes who seek to prove their superiority ability consider planning and self-monitoring strategies of little or no relevance to this purpose depending on the perceived attainability and importance of their personal goals. In line with the current data, studies with undergraduate and high school students showed that Pap had direct links to broad social comparison orientations (Darnon, et al., 2010; Regner, et al., 2007) and indirect effects on metacognition through self-efficacy (Coutinho & Neuman, 2008). In physical education, the direct effect on metacognition was not significant (Ommundsen, 2006; Papaioannou et al., 2009; Theodosiou & Papaioannou, 2006), while the link between ego orientation and interest in comparative or task-referenced feedback was influenced by the level of perceived competence and task orientation (Cury & Sarrazin, 1998; Cury, Sarrazin & Famose, 1997).

In both domains, approach goals had indirect positive relations with self-consequating through goal efficacy, and metacognitive strategies (i.e. planning/monitoring and social comparison). For athletes and exercisers who anticipate success, knowledge of goal progress afforded by self- or other-related monitoring prompted efforts to control motivation through reward and criticism. Moreover, confidence in the attainability of their goals increased the likelihood of self-reward. In contrast to the academic domain (study 1) where goal efficacy discouraged self-criticism, in the physical activity domain, this effect was not supported: participation in sport and exercise during university is less important than academic work, therefore a lack of progress may not be worth criticising. The current findings are consistent with prior research in education showing positive links between approach goals and self-reward or self-praise (Kaplan et al., 2009; Wolters & Rosenthal, 2000). Moreover, in the sport domain, individuals with high task and ego orientations used more positive self-talk and had fewer self-defeating

thoughts after perceived failure than other groups (Gano-Overway, 2008; Harwood et al., 2004); finally, skaters with high perceived competence used more frequently self-motivation strategies (i.e. interest enhancement) than those with low perceived ability (Green-Demers, Stewart & Gushue, 1998).

In both domains, Mav had direct positive relations with self-criticism and negative indirect links to planning and self-monitoring through low goal efficacy and value. When athletes and exercisers fear self-referenced failure (e.g. losing skills, underperforming, failure to adhere to fitness regimens) they lack confidence in their personal goals, anticipate failure, avoid planning and monitoring, and regulate effort through self-criticism. These findings are consistent with the view that affect provides feedback for SR even in the absence of objective feedback based on monitoring and evaluation of progress (Fishbach & Finkelstein, 2012). Further support comes from studies with undergraduate students where Mav had negative indirect relations with metacognitive regulation through low self-efficacy (Coutinho & Neuman, 2008) and positive relations with disorganisation and procrastination (Bartels & Megun-Jackson, 2009; Howell & Watson, 2007; Malka & Covington, 2005).

In both domains, Pav had no relations with goal efficacy, goal value, and SR strategies. These results are not surprising since the metacognitive and motivational strategies investigated in this study represent an adaptive, systematic organised approach to SR, and previous studies in physical education and academia showed that individuals who avoid demonstrating comparative incompetence engaged in maladaptive SR such as self-handicapping (Curry et al., 2003; Elliot et al., 2006; Ommundsen, 2001; 2004; 2006) and task disengagement (Liem et al., 2008).

Theoretical and Practical Implications

Self-Regulation Model. This study makes a significant contribution to our understanding of the ‘why’ and ‘how’ of goal regulation by integrating three distinct areas of research – achievement goals, personal goal attributes and SR of goal progress into one model. Social-cognitive SR models (e.g. Pintrich, 2000a; Zimmerman, 2000) emphasise the importance of

several motivational beliefs in the SR process, but no studies to date have investigated the interactive effects of four achievement goals, efficacy and value beliefs on the SR strategies used by athletes and exercisers. Furthermore, the few existing studies in this field focused on adaptive metacognitive strategies (e.g. planning self-monitoring, self-evaluation) and on one maladaptive motivational strategy (i.e. self-handicapping); no studies addressed to date monitoring through social comparison and motivational self-consequating. Additionally, the goal setting literature highlights the importance of specific, optimally challenging (usually) assigned short-term goals to some aspect of sport performance or exercise adherence. There is no sport or exercise literature on how efficacy and value perceptions of self-set, relatively long-term goals influence goal pursuit processes. Therefore, this study consolidates and extends our understanding of the ‘why’ and ‘how’ of goal regulation by highlighting the importance of investigating: the interactive effects of achievement goals and personal goal attributes on goal striving processes; motivation control in addition to metacognitive regulation strategies, and monitoring/evaluation in relation to multiple standards. Future SR research in sport and exercise settings should investigate additional goal characteristics (e.g. type, difficulty, specificity, temporality) separate measures of metacognitive regulation (e.g. planning, monitoring and control) and a broader range of motivational regulation strategies (e.g. mastery and performance goal self-induction, interest enhancement, self-efficacy control; Wolters, Pintrich & Karabenick, 2005).

Achievement Goal Theory. In line with the contemporary achievement goal theory, in this study approach goals engendered more SR activity than avoidance goals. These results confirmed that the approach-avoidance dimension represents a useful lens for understanding the structure of SR (Elliot, 2006). Approach goals with their focus on success, represent a positive hub of SR and promote an organised, systematic regulation of goal progress. Although both approach goals promote planning, monitoring and self-consequating, a mastery focus is more likely to lead to planning, self-monitoring and self-reward, while a comparative focus is more likely to lead to social comparison and self-criticism. On the other hand, avoidance goals with their focus on failure provide a negative, maladaptive hub of SR and promote little or no systematic SR of goal progress.

The present study confirmed, for the first time in the sport and exercise settings, the centrality of social comparison to Pap goal regulation as an intentional progress monitoring strategy. This finding, therefore, supports the theoretical conceptualisation of Pap by showing that the action or the ‘how’ engendered by Pap is congruent with the intention or the ‘why’ imbedded in it. Moreover, it is interesting to note that this link between Pap and social comparison is not moderated by the objective nature of the domain (i.e. competitive vs. non-competitive). There are two possible explanations for this lack of contextual moderation: some individuals may perceive exercise settings as competitive in nature, therefore the subjective motivational climate may be a better candidate for moderation; and the dual purpose of social comparison – self-improvement (to learn from others) and self-enhancement (to maintain a positive self-image) (Butler, 1995).

In line with the original achievement goal theory and empirical findings (e.g. Biddle et al., 1999; Nicholls, 1989; Sproule et al., 2007), goal efficacy seems to play an intervening role in the link between Pap and SR, either on its own or in combination with goal value. Contrary to theoretical predictions, but in line with some literature, goal efficacy and/or goal value mediated or partially mediated Map effects (e.g. Li et al., 2011; Hulleman et al., 2008). It seems that, value beliefs are tied closely to perceptions of efficacy, with higher efficacy goals holding more value (e.g. Eccles & Wigfield, 1995). These results support previous recommendations to investigate the role of efficacy and as well as value within the framework of achievement goal theory (e.g. Bouffard, Bouchard, Goulet, Denoncourt & Couture, 2005; Harackiewicz & Sansone, 1991; Kingston et al., 2006). Moreover, the reason-standard complex (Elliot, Murayama & Pekrun, 2011) provides an ideal framework for integrating achievement goals and goal setting research, and for exploring the role of personal goal (standard) attributes in the effects of achievement goals (reasons).

Achievement Goal and Personal Goals. Similar to university students in Study 1, athletes and exercisers in this study set only approach goals. Qualitative studies with undergraduate and physical education students also reported very few or no avoidance goals (Okun et al., 2006; Sideridis & Mouratidis, 2008). These findings may be considered as evidence that questionnaire evaluations overestimate the natural occurrence of avoidance goals in contexts

with a low probability for failure (such as education, physical education, exercise and university level sport settings). In academia, criterion based grading allows most students to pass with satisfactory or good grades, while for those few who fail there are multiple opportunities to redeem failure. The exercise domain, on the other hand, is a mastery oriented, non-evaluative domain where success is generally defined as maintenance or improvement of fitness, therefore failure and fear of failure are unlikely. Finally, sport in general may be a competitive domain where few can succeed, however, university sport for this sample of athletes is more about personal performance improvement (59% mastery goals) and involvement (i.e. being part of and keeping one's place in a university team; 18% selection-related goals) than about competition (23% top ranking goals). Future research should investigate athletes' personal goals at higher levels of sport (i.e. elite and sub-elite), where fear of failure and avoidance goals are more likely to be present (Elliot, 2005).

A second explanation for the lack of avoidance personal goals may be provided by the reason-standard complex (Elliot et al., 2011) and the conceptual distinction between concrete standards (i.e. personal goals; the what) and abstract reasons (achievement goals; the why). The hierarchical link between standard used in the service of reason, brings into focus the flexibility of SR: the same standard may serve different reasons. Therefore, personal goals or standards set by athletes and exercisers may be mostly approach in nature because they can serve both approach and avoidance reasons (achievement goals). Future research should investigate both the influence of individual factors such as reason for engagement and contextual factors such as the probability of failure on the selection of personal avoidance goal or standards.

Limitations

Although the present study provided new insights into the relations between achievement goals, personal goal attributes, and SR processes, there are several limitations that should be considered. First, the correlational design employed in this study is a limitation because the concurrent collection of data does not allow causal or bi-directional interpretations of relations between model variables. The assumption that goals influence SR strategy use was based on

the conceptualisation of achievement goals as broad cognitive frameworks (Elliot, 2005); however, SR models allow for cyclical and bidirectional links between model components (Pintrich, 2000a). Future research should employ longitudinal designs which allow for the examination of causal links between the model variables. Second, the generalisation of the current findings is limited to university student-athletes and exercisers for whom involvement in physical activity is of secondary importance to their academic engagement. Future research should test the goal-strategy model in younger and older sport and exercise participants, in highly competitive sport contexts (e.g. elite and sub-elite athletes), and in other cultures. Third, the motivational climate, an important moderator of achievement goal effects, has not been investigated in this study. Its inclusion in future research is highly recommended in light of some evidence that SR activity is influenced by the interaction between personal and situational goals (Ommundsen, 2006; Theodosiou & Papaioannou, 2006).

Conclusion

Similar to study 1 in the academic domain, the current study provided support to the argument that the reasons, standards, and action strategies of student-athletes and exercisers are integrated within the meaning they construct for engagement in physical activity. The academic goal-strategy model appears to generalise to a large extent across sport and exercise settings. This contextual stability strengthens the arguments made in the literature for the integration of achievement goals, goal setting and SR paradigms (Kaplan & Maehr, 2007), and the development of a comprehensive model of goal-action regulation capable to address the why, what and how of achievement behaviour. Finally, as most models of motivation and SR were developed in Western individualistic cultures such as the US and Northern Europe (Biddle et al., 2003; Heckhausen, 1991), future research should investigate: 1) the differences in motivation and SR between individuals from individualistic and collectivistic cultures; and the generalisation of the goal-strategy model identified in the UK (studies 1 and 2) to collectivistic cultures in general (McInerney, 2008; 2011), and Eastern European countries in particular (Realo & Allik, 1999).

CHAPTER 4. Study 3.

Achievement goals and self-regulation processes: Cultural differences and model generalisation in two settings

4.1. Introduction

Theories of motivation and self-regulation (SR) are developed to understand and promote individual and group engagement in activities from different domains of life. Most theories of motivation and SR in education and physical activity settings were developed in Western industrialised nations particularly the US and Northern Europe (Biddle, Wang, Kavussanu, & Spray, 2003; Heckhausen, 1991; Kaplan & Maehr, 2002) and reflect core values deeply embedded in these cultures. The transfer of these theories to other cultures with a different value system can make their application, analysis and practical outcomes problematic. Therefore, recommendations were made in both academic and sport psychology literatures for cross-cultural research with a wider range of cultural groups in general (McInerney, 2008; Wang, Liu, Biddle & Spray, 2005) and Eastern European countries in particular (Realo & Allik, 1999). This study had two main purposes: to investigate differences in achievement goals and SR strategies between elite and sub-elite athletes from the UK and Romania (study 3a), and to test whether the relationships between achievement goals and SR strategies identified in English university students and athletes (studies 1 and 2) generalise to Romanian university students and high level athletes (study 3b).

Culture: Individualism and Collectivism

Subjective culture (as opposed to material culture such as science and art) has been defined as the values, traditions, and beliefs that mediate the behaviours of a particular social group (Parsons, 2003); a society's characteristic way of perceiving its social environment (Triandis, 2002); 'how and why we behave in certain ways, how we perceive reality, what we believe to be true, [...] and what we accept as good and desirable' (Westby, 1993, p. 9). Culture plays an important role in the development of the individual's cognitive, affective and motivational processes through social modelling, social guidance and feedback, and social collaboration

(McInerney, 2008). Such socialization experiences provide people with an interpretative framework or lens that establish their view of the self, the world and the self's place in the world (Markus, Kitayama & Heiman, 1996; Shweder, Goodnow, Hatano, Levine, Markus & Miller, 1998). People everywhere are motivated to view themselves as living up to the cultural norms of what it means to be a good person (Norezayan & Heine, 2005); however, as the nature of social relations varies across cultures, what constitutes a culturally valued person also vary across cultures (Heine, Lehman, Markus & Kitayama, 1999).

Culture is often classified as Western/Eastern, individualistic/collectivistic, modern/traditional and so on. In individualistic (IND) cultures people learn that a valued self (a 'good' person) is construed as a unique, independent and autonomous entity, therefore this worldview prioritises the personal over the social, and the main goal of the person is to '*stand out*', to distinguish oneself positively from others through self-enhancement strategies (Hamamura & Heine, 2008). In contrast, in collectivistic (COL) cultures the valued self is construed as an interdependent, connected, relational entity, therefore people prioritise the social over the personal and their main goal is to '*fit in*' by maintaining good interpersonal relations and group harmony (Heine & Lehman, 1999; Markus & Kitayama, 1991). The independent view of the self is generally supported in the United States and Northern Europe, whereas the interdependent view of the self is characteristic of Asian, African, South American and many South European cultures (Boekaerts, 1998). Culture classifications are useful templates for comparing social groups and for evaluating the match between a theoretical framework and the cultural complexities of a particular society (McInerney, 2008).

Culture and Achievement Motivation

Despite early writings on achievement goals being rooted in cross-cultural psychology (Maehr & Nicholls, 1980), the vast majority of goal research in education and sport psychology has been conducted in Western cultures (Biddle et al., 2003; Heckhausen, 1991). Maehr and Nicholls (1980) argued that goals may operate differently for members of COL and IND cultures. Performance goals (also referred to as ego or ego-social goals; Nicholls, Patashnick, & Nolen, 1985) involve a self-conscious concern with appearing able or avoiding appearing

less able than others, while mastery goals refer to a relatively selfless absorption in the task (Maehr & Kaplan, 2002). As Kaplan, Middleton, Urdan and Midgley (2002) noted: ‘although the effects of pursuing mastery goals are expected to be similar across ethnic and cultural groups, there is reason to suspect that the consequences of performance goal orientation may differ’ (p. 30).

Different cultural perspectives are presumed to promote different motivational processes. An IND emphasis on standing out fosters a bias towards positive information and a focus on distinguishing oneself from others in a positive manner; in contrast, the COL emphasis on fitting in fosters a bias towards negative information and a focus on avoiding relational discord or group disruption by eliminating negative characteristics (Heine et al., 1999; Markus et al., 1996). Therefore IND and COL cultures should promote approach and avoidance goals respectively. On the other hand, the cultural implications for the adoption of mastery and performance goals are not clear cut: IND should foster competitive values, but an analysis of the World Value Survey did not support this relationship (Hayward & Kemmelemeier, 2007); and COL may facilitate mastery goals, due to an emphasis on social interaction, cooperation and harmony (Butler & Ruzani, 1993), and performance goals, due to an emphasis on social approval, social comparison and social hierarchy (Klassen, 2004).

In academic settings, a limited amount of cross-cultural research comparing East Asian, American, East and West European samples reported mixed findings. Some studies supported the stereotype – university students with a more COL self view (e.g. Korean, Asian-American and Russian) adopted more personal avoidance goals and had higher levels of performance-avoidance goal (Pav) than those with an IND self-view (i.e. Anglo-American students) (Elliot, Chirkov, Kim & Sheldon, 2001; Zusho, Pintrich & Cortina, 2005); other studies did not – Chinese high school students scored lower on avoidance goal orientation than both American and German students (Tang & Neber, 2008); also, Asian-American and Chinese students had similar levels of mastery and performance approach goals (Map and Pap) to Anglo-American and German students (Tang & Neber, 2008; Zusho et al., 2005). Additionally, comparisons of Western cultures mostly supported expectations – American and German students were similar in Map and Pap goals and avoidance goal orientation, but not

always – sometimes American students were higher than German students in Pap goals (i.e. relative ability and extrinsic goals) (Pintrich, Zusho, Schiefele & Pekrun, 2001; Tang & Neber, 2008; Zusho et al., 2005).

The few existing studies in sport settings portrayed athletes from COL countries as more focused on outperforming others than personal improvement. Japanese swimmers and PE students were higher in ego orientation and lower on task orientation than American and German athletes and PE students (Alfermann, Geisler & Okade, 2013; Isogai, Brewer, Cornelius, Etnier & Tokunaga, 2003). A similar pattern of findings was reported with Korean and American middle school athletes (Kim, Williams & Gill, 2003). Finally, when compared to English PE students those from Singapore reported higher levels of entity beliefs and performance climate, higher learning and lower improvement (incremental) beliefs, and similar perceptions of mastery climate (Morgan, Sproule, McNeill, Kingston & Wang, 2006; Wang et al., 2005). While the four goal structure was validated in physical activity settings in non-Western nations (e.g. Wang, Biddle & Elliot, 2007), a literature search revealed no cross-cultural comparisons in Pav and Mav goals. *Therefore, study 3a aimed to investigate differences in approach and avoidance goals between Eastern and Western European athletes.*

Culture and Self-Regulation

The predominant paradigm of SR is based on Western theory and research (e.g. Boekaerts & Niemvierta, 2000; Pintrich et al., 2000; Zimmerman, 2000, 2004). Reflecting the shared assumptions of various Western models, Pintrich (2000a) defined SR ‘an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate and control their cognition, motivation and behaviour, guided and constrained by their goals and the contextual features of the environment’ (p. 453). Furthermore, according to Baumeister and Heatherton (1996) SR coordinates cognitions, emotions and behaviours for the attainment of goals and the adherence to social norms. As culture influences the social norms and goals which govern psychological processes, patterns of SR should differ across cultures (Hamamura & Heine, 2008). By Western standards of SR behaviour students from COL

countries are viewed as more passive or less self-regulated learners who rely more on inefficient strategies such as memorization and rehearsal.

McInerney (2011) conducted a review of cross-cultural SR research in academic contexts and concluded that ‘stereotyped views of what particular learning strategies are more salient to particular cultural groups, perpetuated in much theory and research literature, are problematic. There are as many studies contradicting stereotypes as supporting them’ (p. 460). For example, some studies found Asian students to be less self-regulated than American, Canadian and Australian students (Purdie & Hattie, 1996; Salili, Fu, Tong, & Tabatabai, 2001; Tang & Neber, 2008), while others found no differences in SR between American and Australian students and those from Korea, Malaysia, or Singapore (Alexander, Murphy & Guan, 1998; Gorrel, Hwang & Chung, 1996; Pilly, Purdie & Boulton-Lewis, 2000). Furthermore, comparisons of American and North European samples (German, Swiss-German and Norwegian) also provided some mixed findings in relation to cognitive and meta-cognitive SR showing both significant differences – Americans used less or more SR strategies (Luszczynska, Diehl, Gutierrez-Dona, Kussinen & Schwarzer, 2004; Ninniger, 1989; Pintrich, Zusho, Schiefele & Peckrun, 2001; Tang & Neber, 2008) and no differences between these groups (Olaussen & Braten, 1999). Finally, SR comparisons between Western European cultural groups (German, Swiss-German, Swiss-French and Finish) provided evidence of SR similarities and differences based on language (Luszczynska et al., 2004; Ninniger, 1989; 1991). A literature search in the physical activity domain revealed no cross-cultural comparisons in athletes’ use of SR strategies. *Therefore, study 3a aimed to investigate differences in SR strategies between Western and Eastern European athletes.*

Methodological Limitations of Cross-Cultural Research

McInerney (2011) concluded his review of cross-cultural research on motivation and SR with a sharp critique. Specifically, he pointed out that most studies used vague conceptual boundaries, weak methodologies and unsophisticated analyses that made it difficult to evaluate which dimensions were actually investigated. Comparisons between studies were difficult due to the variety of scales used and their questionable validity and reliability properties. Some

studies did not provide validity evidence while others conducted low level validation involving exploratory factor analyses; and only a few studies reviewed employed rigorous cross-cultural validation through confirmatory factor analyses and multi-group invariance checks. *Therefore, multi-group confirmatory factor analyses were carried out on all questionnaires in studies 3a and 3b.*

Another methodological problem that plagues much cross-cultural research is the use of labels such as Asian, American or German as a proxy for culture; this practice is unsatisfactory because it ignores within-group differences in self-construal (McInerney, 2011). In today's global environment dividing nations into IND and COL is no longer realistic as not all of their members fit the stereotype (Singelis & Brown, 1995). When countries are compared on actual measures of self-construal stereotypes are not always confirmed; for example differences between Japan and Germany were found on IND but not on COL (Oyserman, Coon & Kemmelmeier, 2002). Furthermore, research has shown that the independent and interdependent views of the self appear to coexist within every individual regardless of culture, and when activated alter psychological and behavioural outcomes (e.g. Brewer & Gardner, 1996; Gardner, Gabriel & Lee, 1999; Trafimow, Triandis & Goto, 1991). Therefore some argued that self-construal should also be taken into account in cross-cultural research in addition to country, ethnicity or language (e.g. Zusho, 2008). For example, differences in IND versus COL sense of self, whether chronic or situationally induced, explained differences in: self-enhancement strategies (while ethnicity did not; Zusho, 2008), the endorsement of personal approach and avoidance goal in American students (Elliot et al., 2001), and the endorsement of Pap and Pav goals in different generations of American students from COL ethnic backgrounds (Urdan, 2004). Finally, in sport settings, Alfermann et al. (2013) and Wang et al. (2005) recommended the inclusion and control of cultural variables such as IND and COL in future cross-cultural research. *Therefore study 3a aimed to investigate differences between athletes from two European countries in IND and COL self-construals.*

Culture and Sport

Cultural values and norms can affect athletes' view of motivation and SR, therefore cultural differences could be expected between athletes from different countries. This view was labelled the 'cultural influence' hypothesis by Chelladurai, Imamura, Yamaguchi, Oinuma and Miyauchi (1988). On the other hand, competitive athletes, particularly at elite and sub-elite levels of sport are confronted with universal demands that are independent of culture. Therefore, similarities in motivation and SR can be expected in athletes from different countries, a perspective Chelladurai et al. (1988) referred to as the 'athletic imperative'. According to the limited motivational sport literature reviewed above there is more evidence supporting the 'cultural influence' than the 'athletic imperative' perspective.

In addition to the cultural and athletic imperatives, a third perspective is possible as different types of sport may promote different sport 'sub-cultures'. Specifically, participation in team and individual sports are more likely to prime COL and IND self-construals respectively. For example, Lee, Aaker and Gardner (2000) found that the effect of the cultural self on the importance of win and loss in a tennis match was moderated by the contextually primed self (i.e. individual or team scenarios): an avoidance focus was more important in the team match for both Americans and Chinese students, while an approach focus was more important in the individual match, but only for American students. Hence, differences in motivation and SR between athletes may be due to broad or national cultural influences, specific or situational sport sub-cultures or an interaction between the two. *Therefore study 3a aimed to investigate cultural differences between elite and sub-elite (team and individual sport) athletes from two countries in achievement goals and SR, while controlling for variability in self-construals.*

Study 3a Summary and Hypotheses

There is limited or no cross-cultural research: a) with European countries in general and Eastern European countries in particular; b) with athletes in general and elite and sub-elite athletes in particular; c) that controls for individual variability in IND and COL self-construals; d) that takes into account the effects of sub-cultures based on sport type; e) that focus on both approach and avoidance goals and separate measures of meta-cognitive and motivational SR (e.g. planning, self-monitoring, social comparison, self-reward and self-

criticism); and e) that employ rigorous validation procedures such as tests of invariance through multi-group confirmatory factor analyses. Study 3a attempts to fill these gaps by testing for cultural differences between Western and Eastern European elite and sub-elite athletes from team and individual sports in achievement goals and SR strategies while controlling for self-construals, and employing rigorous validation procedures.

In line with previous cultural differences reported between COL and IND countries and the 'cultural influence' perspective in sport, the main hypothesis of this study predicts significant differences between Western and Eastern European athletes in IND and COL self-construals, achievement goals endorsement and SR strategies. Due to the limitations of relevant literature the more specific hypothesis offered are only tentative. Compared with English athletes, Romanian athletes will have: higher COL and lower or similar IND self-views; higher levels of Pap, Pav, Mav goals, social comparison and self-consequating; and similar levels of Map, planning and self-monitoring.

4.2. Study 3a Method

Participants and Procedure

The participants in this study were: 109 Romanian elite (65%) and sub-elite athletes (M age = 20.8 SD = 4.0; 86 males and 23 females; 44 team sport and 64 individual sport athletes); 91 English elite (54%) and sub-elite athletes (M age = 22.0 SD = 6.0; 54 males and 37 females; 67 team sport and 24 individual sport athletes); and 163 university students involved in recreational physical activity (classified as non-athletes) – 81 from Romania (M age = 23.8 SD = 6.6, 12 males and 69 females) and 83 from England (M age = 22.6 SD = 5.3, 31 males and 52 females). Elite athletes competed at national and international level while sub-elite athletes competed at regional and county level. All participants were Caucasians.

Athletes independently completed a 10-minute questionnaire pack (including the scales described below) at the beginning of a training session; and students completed only measures of IND and COL at the end of a class. All participants were provided with a brief explanation of the purpose of the study and were assured that their responses would remain confidential. Ethical committee approval for the research procedure, which complied with the guidelines of the British Psychological Society, was received from the relevant institutional body before data collection. All questionnaires have been translated into Romanian and back into English by two individuals with a good command of both languages (see Romanian translations in Appendices 3, 4 and 5).

Measures

Achievement Goals. The Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot & Hofer, 2003) was developed to assess sport participants' achievement goals; it comprises 12 items and measures four goals (three items per goal): mastery-approach (e.g. 'It is important to me to perform as well as I possibly can'), mastery-avoidance (e.g. I worry that I may not perform as well as I possibly can'), performance-approach (e.g. 'It is important for me to perform better than others') and performance-avoidance (e.g. 'I just want to avoid worse than

others’). The answer scale ranges from 1 (Not at all like me) to 7 (Completely like me) (see appendix 3). The authors reported adequate confirmatory validity and reliability indices with American athletes.

Self-Regulation Strategies. Athletes identified their most important goal for the current competitive season, and then completed the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) in relation to this goal (see appendices 2 and 5). Four SR strategies were measured (one composite planning/self-monitoring scale of six items, and three scales of four items); *planning* refers to planning process steps, scheduling activities and preventing interference from other goals or people (e.g. ‘I try to plan in advance the steps necessary to reach this goal’), *self-monitoring* refers to the monitoring and evaluation of personal progress and daily behaviour (e.g. ‘I keep track of my overall progress on this goal’ and ‘I’m aware of my day-to-day behaviour as I work towards this goal’); *social comparison* refers to the monitoring and evaluation of one’s progress in comparison with others of similar ability, who are working on a similar goal, and are doing better or worse than oneself (e.g. ‘I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing better [worse] than I am’); *self-reward* refers to the use of positive reinforcement for satisfactory goal progress and hard work (e.g. ‘I reward myself when I make progress toward this goal’), and *self-criticism*, refers to verbal punishment for unsatisfactory progress or insufficient effort (e.g. I tend to criticize myself when I’m not making progress toward this goal’). Athletes were asked to indicate how well each statement described their work on their most important goals on a scale ranging from 0 to 4 (0 = Not at all; 4 = Extremely).

Self-Construals. The Self-Construal Scale-Revised (SCS-R; Hardin, 2006; Hardin, Leong & Bhagwat, 2004) is a multidimensional measure of independent and interdependent self-construals developed from Singelis’ (1994) unidimensional measure. Two scales of four items each were selected for this study – Individualism, a measure of independent self (e.g. ‘I feel it is important for me to act as an independent person’) and Esteem for Group, a measure of interdependent self (e.g. ‘It is important to me to maintain harmony within my group’) (see appendix 4). The scales selected for this study had the highest reliability scores (.61 to .79) and the items had the highest factor loadings (.48 to .75) according to two validation studies

(Christopher, Norris D'Souza & Tiernan, 2012; Hardin et al., 2004). The answer scale ranges from 1 (Strongly Disagree) to 5 (Strongly Agree).

Data Analyses

Preliminary Analyses

Validity and Reliability Analyses. First, the validity of all questionnaires was tested in each group through confirmatory factor analyses (CFAs), while the reliability of all subscales was based on Cronbach alphas. Fit indices for each group had to be at least satisfactory in order to proceed with multi-group analyses (Little, 1997). Second, multi-group CFAs were conducted to test a non-restrictive, configural invariance baseline model (i.e. no constraints imposed on any of the parameter estimates across groups) followed by a restricted weak invariance model (i.e. the factor loadings were restricted to be invariant across the two cultural groups). Such constraints would provide evidence to support a common factor structure for each questionnaire across the two groups. Factor loadings are considered to be the minimal condition to demonstrate factorial invariance (Hau & Marsh, 2004).

The model fit was evaluated through a combination of comparative or relative goodness of fit indices – derived from comparisons between the hypothesised and independence models, and absolute fit indices – based on how well the hypothesised model fits the sample data (Browne, McCallum, Kim, Andersen & Glaser, 2002). Two relative indices were selected, the Non-Normed Fit Index (NNFI) and the Comparative Fit Index (CFI), and two absolute fit indices, the McDonald Fit Index (MFI) and the Root Mean Square Error of Approximation (RMSEA) with its 90% Confidence Intervals (CI). NNFI and CFI values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fit to the data (McDonald & Marsh, 1990); MFI values greater than .89 represent a well fitted model (Hu & Bentler, 1999). RMSEA values at or less than .05 and .08 are taken to reflect a close and reasonable fit, respectively (Jöreskog & Sörbom, 1993; Marsh, Bella & Hau, 1996). To evaluate the fit of the two nested invariance models, changes in relative fit indices were examined; decreases greater than .01 indicated that the null hypothesis of invariance should be rejected and that the

less constrained model is more appropriate (Cheung & Rensvold, 2002). The chi-square statistic is often misleading due to its sensitivity to sample size (Chou & Bentler, 1995) and it does not directly provide degree of fit compared to other indices that are normed from 0 to 1 (Bagozzi, 1993). When the sample size is small (like in this study) some authors report the ratio between chi-square (or the corrected version, Sartorra-Bentler scaled chi-square) and degrees of freedom as a fit index; a ratio lower than 3 indicates a good fit (Kline, 1998).

Cultural Differences in Self-Construals. Differences in IND and COL self-construals between Romanian and English athletes and non-athletes (four groups) were tested with a one-way analysis of variance (ANOVA). Testing for differences in self-definition between athletes from Romania and the UK was important for two reasons: to verify the typical classifications attached to these cultures as COL and IND respectively; and to control the effects of relevant self-definition dimension(s) in the main analyses. Furthermore, in order to tease apart the influence of culture and sport status (i.e. athletes versus non-athletes) on self-construals, non-athletes (i.e. students) were also included in the ANOVA.

Main Analyses

Differences between Romanian and English athletes by country, sport type and gender in achievement goals and SR strategies were tested with multivariate analyses of covariance (MANCOVA) with self-construals as covariates. These were followed up by corresponding univariate analyses of covariance (ANCOVA) for each dependent variable. In addition to the usual F and p values, partial η^2 were included as an estimate of effect size; values of .01, .06 and .14 represent a small, medium and large effect size respectively (Cohen, 1988).

4.3. Study 3a Results

Preliminary Analyses

Validity and Reliability Analyses. CFAs carried out in each cultural group separately supported the validity of the factor structure for each questionnaire; goodness-of-fit indices ranged from acceptable to excellent (see table 4.1). Multi-group analyses were conducted next, and both configural and weak invariance models displayed an acceptable or excellent fit to the data; the constrained models did not display a significant decrease in model fit in comparison to the baseline models (ΔNNFI and $\Delta\text{CFI} \leq -0.01$) (Cheung & Rensvold, 2002). Reliability alpha coefficients were (Romania/UK): moderate for individualism and Map (.59/.51 and .64/.60 respectively), acceptable for collectivism (.74/.74), and good for Pap (.90/.85), Pav (.91/.83), Mav goals (.74/.76), planning/monitoring (.84/.79), social comparison (.90/.80), self-reward (.84/.83), and self-criticism (.74/.75).

Cultural Differences in Self-Construals. A one-way ANOVA showed significant differences between Romanian and English athletes and non-athletes in IND ($F_{(3, 338)} = 4.20$ $p < .01$) and COL ($F_{(3, 338)} = 10.36$ $p < .0005$). Post-hoc Tuckey HSD t-tests revealed that: Romanian students were higher in IND than athletes from both countries, but were similar to English students; and Romanian participants (athletes and non-athletes) were higher in COL than UK participants (see table 4.2). It seems that IND levels vary according to sport status, while COL varies according to culture. Therefore, COL was the only measure of self-construal used in the main analyses.

Main Analyses

Differences in Achievement Goals and Self-Regulation Strategies. The first MANCOVA with achievement goals as dependent variables revealed significant multivariate main effects for culture ($F = 5.64$, $p < .0005$), sport type ($F = 2.98$, $p < .05$) culture by sport type interaction ($F = 2.60$, $p < .05$) and COL ($F = 2.67$, $p < .05$). The second MANCOVA with four SR strategies as dependent variables revealed significant multivariate effects for culture ($F = 4.15$, $p < .005$),

culture by sport type interaction ($F = 5.40, p < .0005$) and COL ($F = 6.12, p < .0005$). As gender had no significant effect on either group of variables it was dropped from further analyses. Follow-up ANCOVAs with each goal and SR strategy as dependent variables and COL as a covariate, revealed significant differences between Romanian and English athletes after controlling for COL self-views (see table 4.3): 1) main effects for country on all goals but Mav goal, and all SR strategies; 2) main sport type effects on Pap, Pav goals and social comparison, and 3) culture by sport type interaction effects on Map goal and planning/monitoring. Overall Romanian athletes were higher than the English athletes on three out of four goals and all four SR strategies. However, the differences in Map (Romania $M/SD = 20.45/.85$; UK $M/SD = 17.96/2.73$) and planning/monitoring (Romania $M/SD = 18.53/3.52$; UK $M/SD = 12.15/4.30$) were only significant in team sports ($t = 6.99$ and $t = 8.14$ respectively, $p < .0005$).

Table 4.1. Confirmatory factor analyses: Robust indices for all questionnaires.

			$s-B \chi^2 / df$	NNFI	CFI	MFI	RMSEA(CI 90%)
Individualism and Collectivism Scales							
Single-Group	Romanians		1.31	.91	.94	.95	.07 (.00 -.12)
	English		1.45	.90	.95	.98	.07 (.00 -.11)
Multi-Group	Configural		1.60	.91	.95	.99	.06 (.00 -.10)
	Weak		1.35	.95	.97	.99	.05 (.00 -.09)
Achievement Goal Questionnaire-Sport							
Single-Group	Romanians		1.39	.96	.98	.96	.06 (.00 -.10)
	English		1.16	.96	.98	.98	.05 (.00 -.11)
Multi-Group	Configural		1.22	.96	.98	.97	.05 (.00 -.09)
	Weak		1.44	.95	.97	.95	.06 (.02 -.10)
Goal Systems Assessment Battery							
Single-Group	Romanians		1.54	.93	.96	.94	.07 (.04 -.10)
	English		1.72	.92	.95	.89	.08 (.04 -.11)
Multi-Group	Configural		1.40	.93	.96	.91	.06 (.04 -.09)
	Weak		1.46	.92	.95	.90	.07 (.04 -.09)

Table 4.2. Descriptive statistics for self-construal dimensions

	N	Individualism		Collectivism	
		M	SD	M	SD
Romanian athletes	109	4.67 ^a	1.31	6.08 ^{ce}	1.03
Romanian non-athletes	81	5.20 ^{ab}	1.07	6.02 ^{df}	1.04
UK athletes	91	4.75 ^b	1.04	5.57 ^{cf}	1.05
UK non-athletes	83	5.04	0.98	5.35 ^{de}	0.94

Similar subscripts represent significant differences; a,b, f $p < .05$; c < .01; d, e $p < .0005$

Table 4.3. ANCOVA results for achievement goals and self-regulation strategies

Variable	Country F	η^2	Romania M/SE	UK M/SE	Sport Type F	Team M /SE	Individual M /SE
<i>Achievement Goals</i>							
Performance-Approach	27.18***	.12	11.04/.32	8.39/.39	10.60**	10.52/.31	8.91/.38
Performance-Avoidance	10.33**	.05	8.79/.38	6.83/.46	14.64***	8.94/.37	6.67/.46
Mastery-Approach	16.67***	.08	19.78/.19	18.53/.23	0.18	19.22/.19	19.09/.23
Mastery-Avoidance	0.10	.00	9.57/.31	9.41/.38	1.56	9.19/.31	9.80/.38
<i>Self-Regulation</i>							
Planning/Monitoring	26.35***	.12	17.14/.40	13.89/.48	0.81	15.24/.39	15.80/.47
Social Comparison	26.68***	.12	9.40/.39	6.19/.47	4.63*	8.44/.38	7.14/.46
Self-Reward	29.42***	.13	9.29/.35	6.28/.42	0.02	7.75/.34	7.82/.41
Self-Criticism	31.86***	.14	10.34/.30	7.61/.37	3.26	9.40/.30	8.55/.36

M = mean; SE = Standard Error; η^2 = effect size; * $p < .05$ ** $p < .005$; *** $p < .0005$

4.4. Study 3a Discussion

Study 3a investigated mean level differences in self-construals, achievement goals and SR between athletes from two cultures. A preliminary consideration of differences in intraindividual and interindividual self-construals between Romanian and English athletes had two important methodological purposes: to obtain direct evidence of cultural classification of the two countries along the IND-COL dimension; and to obtain a more accurate understanding of cultural differences in athletes' achievement goals and SR strategies by taking into account sport type (team versus individual) and by controlling the effects of self-definitions. It was predicted that Romanian athletes would be higher than English athletes in COL, performance and Mav goals, social comparison and self-consequating; similar or lower in IND, and similar in Map, planning and self-monitoring. Most hypotheses were supported, with two exceptions – Romanian team athletes were higher on Map, planning and self-monitoring than their English counterparts; and the two groups were similar in their endorsement of Mav goal.

Preliminary analyses of chronic cultural self-construals showed that Romanian young adults, athletes and non-athletes, had stronger COL self-views than their English counterparts, but the two groups were similar in IND self-definition. These findings lend partial support to the COL stereotype attached to a former socialist East European country. It seems young Romanians' view of themselves had become more IND in nature during the past 20 years of transition to a capitalist market economy, and reached a level similar to young adults from a West European country. However, Romania's 45 years of socialist heritage continues to exercise its influence on individuals' COL self-views as deeply embedded in the tight network of social relations. Inconsistent support for cultural stereotypes have been reported before: Germany and Japan differed in IND but not COL (Oyserman et al., 2002), and Estonians were less COL than Russians and Americans (Realo & Allik, 1999).

Main analyses of differences in achievement goals and SR between Romanian and English elite and sub-elite athletes revealed a mixed pattern of results: cultural effects, culture by sport type interactions and no effects. Firstly, Romanian athletes, regardless of sport type, had higher scores on Pap and Pav goals, social comparison and self-consequating strategies than English athletes. As expected, team and individual sport athletes from a more COL culture had more extrinsic goals related to social standing and engaged in more SR activity consistent

with these goals. This study provided evidence for the first time of differences in performance goals (Pap and Pav), social comparison, and self-motivation strategies between Eastern and Western European elite and sub-elite athletes. The current data are consistent with differences found between PE students and adolescent elite athletes from East Asia (Japan, Singapore) and North Europe (UK, Germany) in ego orientation, entity beliefs and performance climate (Alfermann et al., 2013; Morgan et al., 2006; Wang et al., 2005).

Secondly, Romanian team athletes had higher scores on Map goal, planning and self-monitoring than their English counterparts, whereas no differences were found in these variables between individual sport athletes from the two countries. In other words, Romanian team players had a keener interest in the development of their skills and engaged more in SR instrumental to this purpose than English team players. These findings may seem counterintuitive at first sight since individual development is essential to team success in any culture. However, Romanian team players have a particularly strong COL orientation emanating from the convergent influences of sport and national cultures; therefore, the quality of individuals' performance had implications for a broader social network that included their teammates in addition to their club, family, community and country. Previous studies with East Asian and Western sport participants of different ages and ability levels reported mixed findings: Asian adolescent elite swimmers and PE students had lower levels of task orientation, than those from Germany or the US (Alfermann et al., 2013; Isogai et al., 2003; Kim et al., 2003); and PE students from Singapore had higher learning and lower improvement (incremental) beliefs than, and similar perceptions of mastery climate to UK students (Morgan et al., 2006; Wang et al., 2005).

Finally, this first cross-cultural investigation of athletes' Mav goals revealed similarities between Romanian and English elite and sub-elite athletes. In theory Romanian athletes, due to their stronger COL orientation should be higher in avoidance motivation than the less COL English athletes (Hamamura & Heine, 2008). However, their similar level of concern with personal stagnation may be explained in terms of age or stage in athletic career – both group were relatively young and had ample time to improve. Differences may exist between older athletes, who are prime candidates for Mav goals (Elliot & Conroy, 2005). As selection to representative teams is often based on potential for improvement in addition to proven athletic

ability, older Romanian athletes may be more concerned with a performance plateau than their English counterparts.

In conclusion, study 3a provided support for: the COL cultural influence (Chelladurai et al., 1988) on performance goals, social comparison and self-consequating; the interaction of culture and sport type influences on Map goal, planning and self-monitoring; and, the athletic imperative hypothesis in relation to Map; these latter similarities, however, may be one aspect of an interaction effect between culture and age (or stage in athletic career) in high level athletes.

Study 3b. Cross-Cultural Generalisation of Academic and Sport Self-Regulation Models

4.5. Study 3b Introduction

Motivation and Self-Regulation

Recent SR models (Pintrich, 2000a; Zimmerman, 2000) emphasise the close links between motivation (e.g. achievement goals, task valuing and self-efficacy) and SR activity (i.e. goal setting, planning, monitoring and evaluation of progress and self-control strategies). In academic contexts, the relations between motivation and SR strategy use were similar in COL East Asian and IND Western developed countries. Consistently, an incremental theory of ability and mastery/intrinsic goals were positively related to cognitive and meta-cognitive SR strategy use in several cultures (i.e. Hong Kong, Taiwan, Germany, Norway, Holland, and Spain) (Blom & Severins, 2008; Braten & Olaussen, 1998; Ommundsen, Haugen & Lund, 2005; Pintrich et al., 2001; Riveiro et al., 2001; Salili et al. 2001; Shih, 2005); performance/extrinsic goals were positively related to cognitive and meta-cognitive SR in Germany and Taiwan (Pintrich et al., 2001; Shih, 2005); and a fixed theory of ability, and performance or work avoidance goals were positively related to self-handicapping and negatively related to meta-cognitive SR, in Taiwan, Spain and Norway (Ommundsen et al., 2005; Riveiro et al., 2001; Shih, 2005).

In the physical activity domain, there is limited research investigating achievement goals and SR strategies in European countries. In physical education classes, mastery goals were positively related, while performance goals were positive or null predictors of meta-cognitive strategies in Norway and Greece (i.e. planning, self-monitoring, self-evaluation) (Ommundsen, 2006; Papaioannou, Simou, Kosmidou, Milosis & Tsigilis, 2009; Theodosiou & Papaioannou, 2006) and rehearsal strategies in the UK and Estonia (e.g. imagery, self-talk, practice) (Hein & Muur, 2004; Spray, 2001;2002); and, negatively related to self-handicapping in France and Norway (Elliot, Cury, Fryer & Huguet, 2006; Ommundsen, 2001; 2004; 2006). Additionally, Norwegian students' Pav goal was positively related to self-handicapping (Ommundsen, 2006). In sport settings, French soccer players' task and ego orientations were related to deep and surface cognitive strategies respectively (Thill & Brunel, 1995); English athletes with a moderate or high task and ego profile used more SR strategies

(goal setting, imagery and positive self-talk) than those with other profiles (Cummings, Hall, Harwood & Gammage, 2002; Harwood, Cummings & Hall, 2003; Harwood, Cumming, & Fletcher, 2004); and task and ego orientations were positive and null predictors respectively of English athletes' engagement in goal setting and positive self-talk (a form of self-reinforcement) (Van de Pol & Kavussanu, 2011).

Moreover, studies 1 and 2 of this thesis, showed that for English university students and athletes: approach and Mav goals had indirect positive and negative effects respectively on planning and self-monitoring through goal efficacy and value; Pap, Mav and Map had direct positive effects on social comparison, self-criticism and (in education only) planning/monitoring, respectively; social comparison and planning/monitoring had direct positive effects on self-reward and self-criticism; and finally, goal efficacy had direct negative and positive effects on self-criticism (in academia only) and self-reward. *Study 3b aimed to investigate: the relations between achievement goals, personal goal attributes (efficacy and value) and SR strategies in explicitly competitive academic and sport settings in a COL culture; and the extent to which the SR models identified in an IND culture (studies 1 and 2) generalise to a COL culture.*

Finally, goal content has become a topical issue in the achievement goal theory (Senko, Hulleman, & Harackiewicz, 2011). In contrast to questionnaire-based studies, qualitative investigations of goal content with undergraduate and physical education students from IND cultures reported a low incidence of avoidance and performance-comparative goals (study 1; Horowitz, 2010; Okun et al., 2006; Sideridis & Mouratidis, 2008; Urdan, 2001). These inconsistent findings in education led some authors to question the phenomenological reality of achievement goals measured through questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006). No studies on athletes' goal content were found in the literature, but English university athletes in study 2 reported similar types of goals to students in study 1 (i.e. no avoidance and few performance-comparative goals). The low prevalence of these goals could be due to environmental factors (i.e. low probability of failure in moderate competitive domains such as academia and low level sport) and/or cultural imperatives (i.e. a focus on attaining success rather than avoiding failure in IND cultures). *Therefore, study 3b also aimed*

to investigate the personal goal contents of students and athletes from a COL culture in explicitly competitive settings.

Summary and Hypotheses

There are no studies in the academic and sport psychology literatures that validated complex SR models involving four achievement goals and a range of SR strategies in competitive environments from European or Eastern European cultures. Study 3b validated such a complex SR model in the competitive academic and sport contexts of a COL Eastern European country. In Romanian universities, tuition fees for the top 50% of students (based on annual average grade) are paid by the state, and the top 10% of students receive scholarships. Therefore, every academic year students compete with each other for these financial rewards and grades are instrumental in securing a place in the top fifty. Furthermore, the sport context in this study is highly competitive as the Romanian participants were experienced elite national and international athletes and sub-elite athletes who compete in two divisions below the national league.

In line with previous literature showing similarities in achievement goals and SR relations in IND and COL cultures, and the relations found in the UK (i.e. studies 1 and 2 respectively) the academic and sport SR models in Romania were based on the following predictions (see figure 4.1):

1. Pap will have direct positive relations with social comparison and goal efficacy; indirect positive relations with planning and self-monitoring, through goal efficacy and value;
2. Map will have direct positive relations with goal efficacy, goal value, and (in education only) planning/self-monitoring; and indirect positive relations with planning/self-monitoring through goal efficacy and value.
3. Pap and Map goals will have indirect relations with self-consequating strategies through social comparison and planning/monitoring respectively, and through goal efficacy.

4. Mav will have two direct relations, positive with self-criticism and negative with goal efficacy, and two negative indirect relations, with planning/self-monitoring through goal-efficacy and value, and with self-reward through goal efficacy.
5. Pav will have null relations with goal efficacy, and social comparison.

Finally, it is hypothesised that Romanian students will set mostly performance-outcome goals (i.e. related to grades) and few or no comparative-performance goals (related to outperforming peers or ranking), and high level athletes will set mostly approach performance-comparative personal goals (i.e. related to winning or ranking).

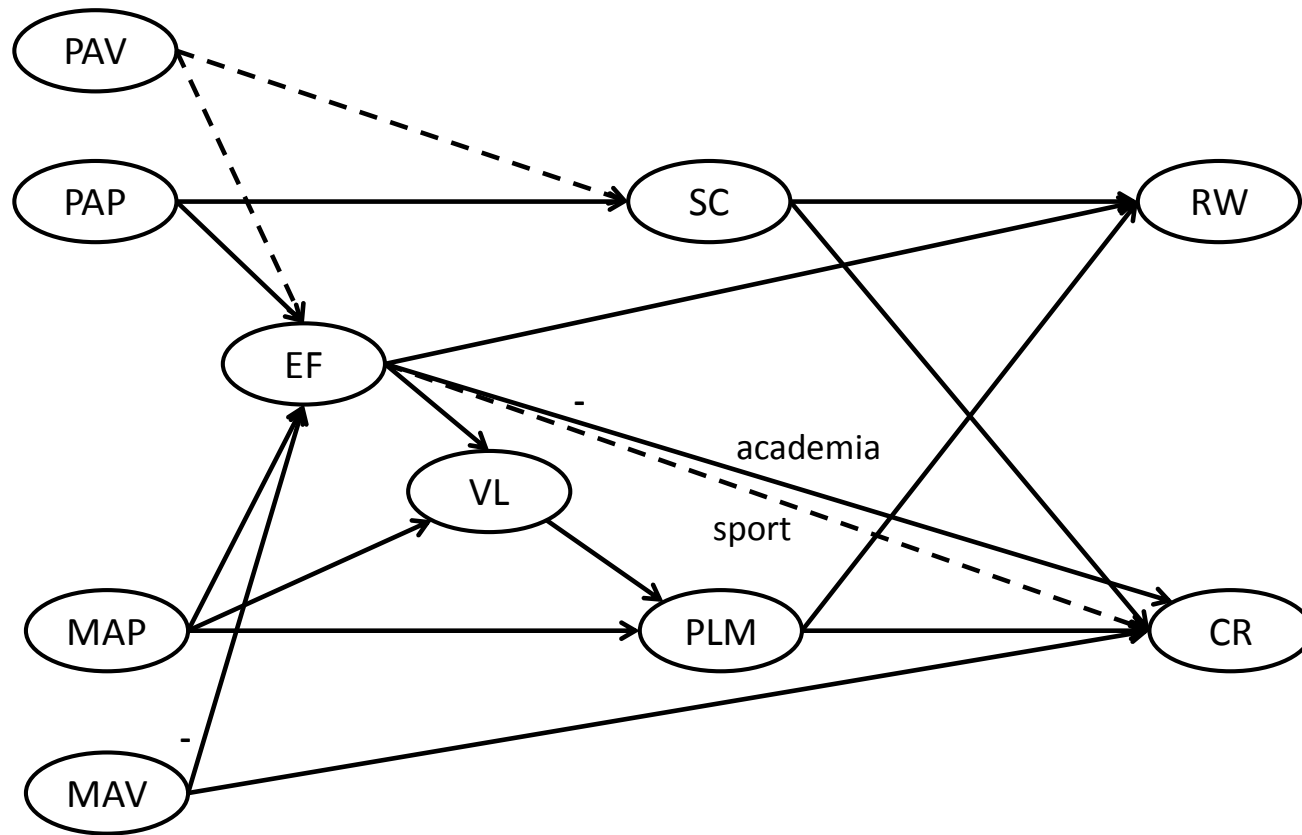


Figure 4.1. The hypothesised academic and sport models in Romania (dashed line - non significant paths; PAV – Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM – Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR – Self-Criticism)

4.6. Study 3b Method

Participants and Procedure

The participants were 196 Romanian student-athletes (120 males and 76 females; mean age 23.04 years, $SD = 3.82$), on a Physical Education and Coaching Science degree. 108 (61.2%) were elite athletes who competed at national (76) and international level (32); and 84 were sub-elite athletes who competed in divisions A and B (i.e. below national league). 116 (59.7%) were involved in team sports and 76 in individual sports; 4 (2%) did not enter sport information. All participants were Caucasians. Participants independently completed a 20-minute questionnaire pack during a class, two or three weeks before exams; they were provided with a brief explanation of the purpose of the study and were assured that their responses would remain confidential. Ethical committee approval for the research procedure, which complied with the guidelines of the British Psychological Society, was received from the relevant institutional body before data collection.

Measures

Achievement Goals in Sport. The Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot & Hofer, 2003) described earlier was used in this study (see appendix 3).

Achievement Goals in Education. The Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) was developed to assess students' achievement goals; it comprises 12 items and measures four goals (three items per goal): mastery-approach (e.g. 'I want to learn as much as possible from this course'), mastery-avoidance (e.g. 'I worry that I may not learn all that I possibly could on this course'), performance-approach (e.g. 'It is important to me to do better than other students') and performance-avoidance (e.g. 'I just want to avoid doing poorly on this course'). The answer scales ranges from 1 (Not at all like me) to 7 (Completely like me) (see appendix 1). The authors reported adequate confirmatory validity and reliability indices with American undergraduate students. The original questionnaire measures students' goals in relation to a specific subject of study by making references to 'this class'. In the

present study, students' goals for the academic domain in general were measured through references to 'this degree' as the focus in this study was on broad achievement goal.

Personal Goal Attributes and Self-Regulation Strategies. Student-athletes identified their most important goal in one domain (i.e. academic or sport) for the current year, and then completed the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) in relation to this goal (see appendices 2 and 5). The second completion of the GSAB was related to their most important goal in the second domain (i.e. sport or academic). In addition to the four SR strategies described earlier (planning/self-monitoring, social comparison, self-reward and self-criticism) this questionnaire measured two personal goal characteristics – goal *value* (e.g. 'This goal is valuable to me') and goal *efficacy* (e.g. 'I have the ability to reach this goal'). As before, students were asked to indicate how well each statement described their work on their most important goals on a scale ranging from 0 to 4 (0 = Not at all; 4 = Extremely).

Data Analyses

Validity and Reliability Analyses. As before, the validity of all questionnaires was tested through confirmatory factor analyses (CFAs) (i.e. NNFI, CFI, MFI, RMSEA, 90%CI, and χ^2_{S-B}/df), while the reliability of all subscales was based on Cronbach alphas.

The Hypothesised Model. Structural equations modelling (SEM) analyses with EQS 6.1 (Bentler & Wu, 2002) were conducted to test the hypothesized model in the academic and sport domains. Based on literature recommendations (Fan, Thompson & Wang, 1999; Hu & Bentler, 1998; Marsh, 2007) model fit was evaluated through a combination of relative and absolute goodness-of-fit indices: χ^2_{S-B}/df , NNFI, CFI, RMSEA, and CI90%. Simulation studies showed that these fit indices were the least influenced by sample size (Fan et al., 1999). Moreover, Hu and Bentler (1998) recommended CFI and RMSEA due to their sensitivity to model misspecification.

4.7. Study 3b Results

Preliminary Analyses

Personal Goals Analyses. Two individuals with expertise of the achievement goal theory and goal setting literatures, implemented a coding system to categorise each freely reported goal along the performance-mastery and approach-avoidance dimensions. The inter-coder agreement was 97.8% and 98.2% in the academic and sport domains respectively; disagreements were resolved through discussion. Most academic goals were performance outcome and normative goals (N = 180; 91.8%) of which 20 (10.2%) were avoidance goals (avoid failing exams) and 160 (81.6%) were approach goals: 98 (50%) ‘pass’, 30 (15.3%) ‘high or good grades’, and 32 (16.3%) ‘ranking’ (getting or keeping a place in the top 10 % or top 50%). Seven students set mastery goals (3.6%) and 9 students did not enter their goals (4.6%). All sport goals were approach goals: 35 (17.9%) were mastery/process goals (improving some aspect of performance) and 156 (79.6%) were performance outcome and normative goals: 97 team sport athletes set competitive team-related goals (48 aimed for a top position in the national league, and 30 aimed for promotion to the national league or division A) and individual goals (19 aimed to move to better teams); 59 individual sport athletes aimed for medals or a place in the final of national or international championship (47) and selection to the national team (12); finally 5 goals were missing (2.5%).

Descriptive Statistics and Correlations. Descriptive statistics and correlations between all variables in both domains are presented in table 4.4.

Validity and Reliability Analyses. CFAs on AGQ and AGQ-S items provided support for the four factor goal structure in both domains. Additionally, CFAs on GSAB parcelled items (three parcels to the planning/self-monitoring scale, and two parcels to the other scales) confirmed the six factor structure in both domains. Robust goodness-of-fit indices were good or excellent for AGQ and AGQ-S (academia/sport: NNFI = .95/.96; CFI = .96/.97; MFI = .93/.96; RMSEA = .06/.05 90%CI = .04/.01 - .08/.07; $\chi^2_{S-B}/df = 1.68/1.40$) and GSAB (academia/sport: NNFI = .94/.96; CFI = .96/.98; MFI = .91/.96; RMSEA = .06/.04 90%CI =

.04/.00 - .06/.07; $S-B \chi^2/df = 1.71/1.32$). In both contexts, all scales were found to be reliable with alpha values ranging from .72 to .89 for achievement goals, and from .73 to .87 for SR processes (see table 4.4).

Main Analyses

The Hypothesized Model. Initial SEM analyses in both domains revealed models with a less than adequate fit based on absolute and relative indices. Therefore, in the academic domain, based on LM tests one new path was added to the model, from Map to social comparison; this negative link is consistent with theoretical predictions. Moreover, Wald tests indicated the redundancy of three paths: from Map and Mav to self-efficacy, from Mav to planning/self-monitoring and from social comparison to self-criticism; these paths were deleted from the final academic model (see figure 4.2). Robust fit indices for the final academic model were adequate: NNFI = .90, CFI = .92; RMSEA = .04, CI 90% = .02 - .07; and $S-B \chi^2/df = 1.70$. The standardized path coefficients are presented in table 4.5.

In the sport domain, two new paths were added to the model based on LM tests, Pav to social comparison, and self-efficacy to planning/self-monitoring; both links are consistent with theoretical predictions. Following Wald tests, five paths were deleted from the final sport domain model: Pap to self-efficacy and social-comparison, Mav to self-efficacy, self-efficacy to self-reward and social comparison to self-criticism (see figure 4.3). Robust fit indices for the final sport model were good: NNFI = .95, CFI = .96; RMSEA = .04, CI 90% = .02 - .05; and $S-B \chi^2/df = 1.22$. The standardized path coefficients are presented in table 4.5.

Table 4.4. Descriptive statistics, alpha coefficients and correlations for all variables in two domains

	N	M	SD	Range	Alpha	PAP	PAV	MAP	MAV	EF	VL	PLM	SC	RW
<i>Academic Domain</i>														
PAP	196	4.81	1.59	6.00	.89									
PAV	196	4.52	1.58	6.00	.74	.50								
MAP	196	5.72	1.03	5.00	.79	.36	.17							
MAV	196	4.30	1.40	6.00	.76	.36	.35	.24						
EF	197	2.70	0.56	2.75	.83	.19	.09	.14	.07					
VL	197	3.26	0.60	2.75	.86	.19	.04	.32	.05	.34				
P/M	197	2.40	0.63	4.00	.82	.31	.12	.42	.16	.41	.59			
SC	197	1.69	0.85	3.25	.86	.52	.36	.03	.19	.08	.13	.38		
RW	197	1.88	0.81	4.00	.87	.22	.06	.11	.04	.24	.22	.33	.31	
CR	197	1.87	0.79	4.00	.86	.13	.12	.35	.29	.06	.29	.48	.25	.18
<i>Sport Domain</i>														
PAP	199	5.56	1.32	6.00	.74									
PAV	199	4.38	1.62	6.00	.75	.50								
MAP	199	6.53	0.56	3.00	.72	.16	.11							
MAV	199	4.65	1.51	6.00	.85	.06	.12	.09						
EF	196	2.86	0.59	2.50	.75	.04	-.01	.23	-.12					
VL	196	3.37	0.56	2.25	.86	.16	.12	.31	.03	.32				
PLM	196	2.68	0.53	2.83	.73	.18	-.02	.28	.02	.41	.46			
SC	196	2.02	0.77	3.50	.78	.32	.39	.01	.13	.06	.08	.25		
RW	196	2.02	0.76	3.75	.84	.09	.06	.03	-.03	.12	.14	.22	.19	
CR	196	2.21	0.76	4.00	.79	.09	.00	.15	.31	.06	.28	.29	.18	.17

PAP – Performance-approach; PAV – Performance-avoidance; MAP – Mastery-approach; MAV – Mastery-avoidance; EF – Goal Efficacy; VL – Goal Value; PLM – Planning/Self-Monitoring; SC – Social Comparison; RW – Self-Reward; CR – Self-Criticism.

Academic domain $r = .15 - .18$ $p < .05$; $r > .18$ $p < .01$. Sport domain: $r = .14 - .18$ $p < .05$; $r > .18$ $p < .01$.

Table 4.5. Standardized path coefficients and R² values for the final academic and sport models

Paths	Academic Model Standardized Coefficient	R ²	Sport Model Standardized Coefficient	R ²
To Goal Efficacy from		.07		.12
Performance-Approach	.26		-	
Mastery-Approach	-		.32	
Mastery-Avoidance	-		-.19	
To Goal Value from		.26		.27
Goal Efficacy	.39		.29	
Mastery-Approach	.29		.35	
To Planning/Monitoring		.59		.63
Goal Efficacy	-		.36	
Goal Value	.64		.58	
Mastery-Approach	.26		-	
To Social Comparison		.42		.25
Performance-Approach	.69		-	
Performance-Avoidance	-		.50	
Mastery Approach	-.27		-	
To Self-Reward from		.15		.11
Planning/Monitoring	.29		.27	
Social Comparison	.26		.19	
To Self-Criticism from		.45		.37
Planning/Monitoring	.64		.58	
Goal Efficacy	-.24		-.23	
Mastery-Avoidance	.23		.35	

r > .19 p < .0

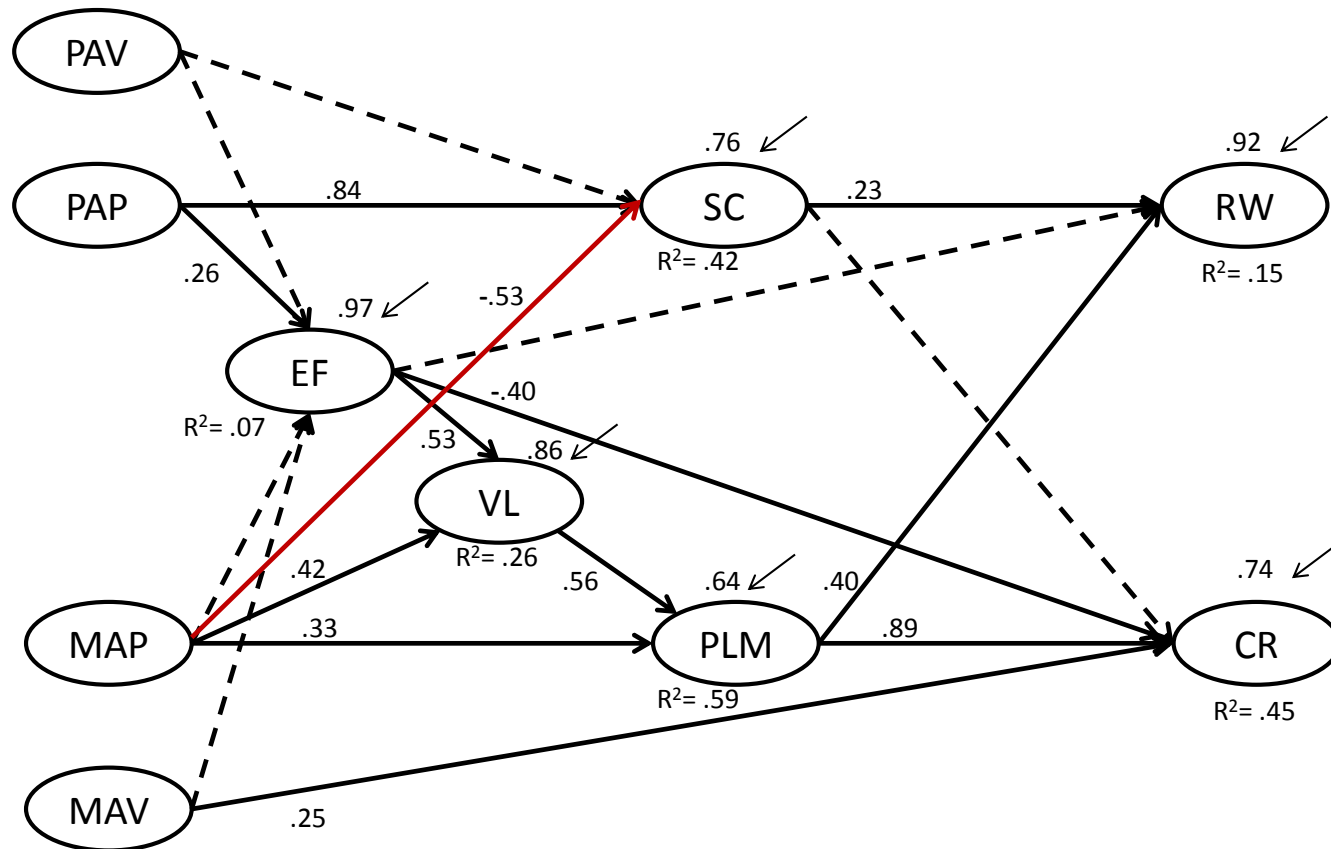


Figure 4.2. The final academic model in Romania showing beta values, R^2 and disturbance terms (dashed line - non significant path; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

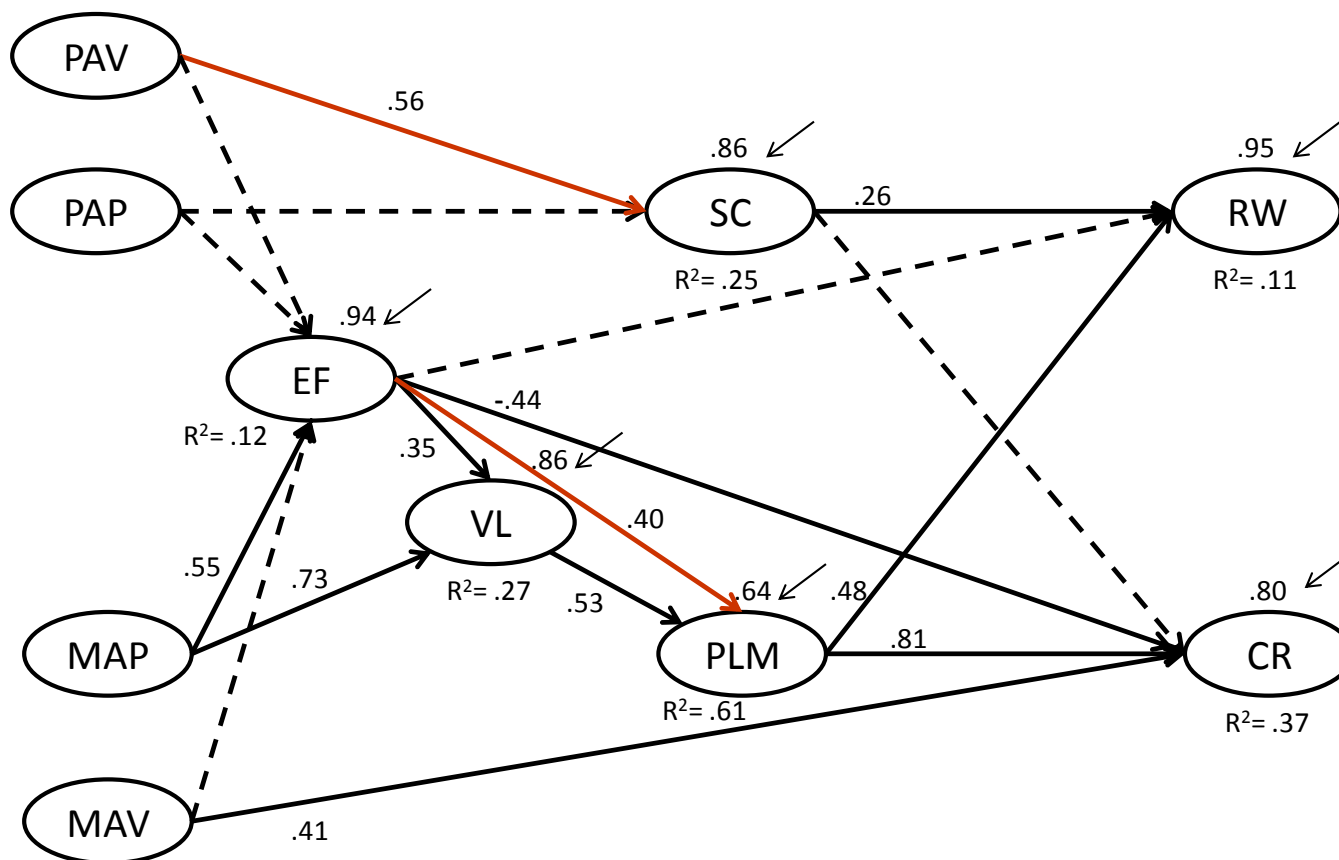


Figure 4.3. The final sport model in Romania showing beta values, R^2 and disturbance terms (dashed line - non paths; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism)

4.8. Study 3b Discussion

Study 3b addressed two important questions: what is the nature of achievement goals and SR relations in two competitive domains in a COL Eastern European country; and to what extent the SR models validated with English university students-athletes can be generalized to Romanian students and high level athletes. Similarities between studies 1, 2 and 3b would demonstrate the cross-cultural generalisation of model paths, while the differences between the two countries would provide evidence of cultural and domain influences on model paths. As expected, in both domains, there were more similarities than differences between model paths in Romania and the UK.

Achievement Goals and Self-Regulation Model: Cultural and Domain Similarities

In the academic domain eleven out of fifteen paths identified in UK have been confirmed in Romania and ten were positive (see figure 4.2): 1) Pap to social comparison and goal efficacy; Map to goal value and planning/monitoring; and Mav to self-criticism; 2) goal efficacy to goal value and (negative) to self-criticism; value to planning/monitoring; and 3) planning/self-monitoring to both self-consequating strategies, and social comparison to self-reward. Similar to the English students in Study 1, the current findings demonstrated that for Romanian students approach goals engendered perceptions of goal efficacy and value and involvement in metacognitive (planning, self-monitoring, social comparison) and self-motivation strategies (self-reward and self-criticism), while Pav was not conducive to any SR activity. Similar relations between achievement goals and composite measures of metacognition were reported in education in different countries from Western Europe and East Asia (Blom & Severins, 2008; Braten & Olaussen, 1998; Ommundsen et al., 2005; Pintrich et al., 2001; Riveiro et al., 2001; Salili et al. 2001; Shih, 2005). This study extends the literature in three ways: it identified goal value as a mechanism of Map effects on planning and self-monitoring, it showed that Pap promotes monitoring through social comparison, and that three goals (Pap, Map and Mav) influenced the use of motivational regulation in an Eastern European COL culture.

In the sport domain, eight of thirteen model paths identified in the UK (study 2) have been confirmed in Romania, and seven were positive (see figure 4.3): 1) Map to goal efficacy, and

value; Map to self-criticism; 2) efficacy to value; value to planning/monitoring; and 3) planning/monitoring to both self-consequating strategies, and social comparison to self-reward. Similar to English university athletes, these results demonstrated that for Romanian elite and sub-elite athletes Map engendered perceptions of goal efficacy and value and involvement in planning, self-monitoring and self-motivation, while Mav was conducive to self-criticism. Similar relations between Map and composite measures of metacognition were reported in physical education in West European countries (Hein & Muur, 2004; Ommundsen, 2006; Papaioannou et al., 2009; Spray, 2001; 2002; Theodosiou & Papaioannou, 2006). The current data provides an extension to the sport psychology literature, by showing that: goal efficacy and value explain Map effects on metacognition (i.e. planning and self-monitoring); and both mastery goals promote motivational regulation strategies in high level athletes from an Eastern European COL country.

Achievement Goals and Self-Regulation Model: Some Cultural and Domain Differences

There were some cultural and domain differences in the pattern of relations between achievement goals, social comparison, goal efficacy and self-consequating. A few paths were not significant – four in education (Map and Mav to efficacy; efficacy to reward, and social comparison to criticism) and five in sport settings (Mav to goal efficacy, Pap to efficacy and social comparison, and from these two variables to reward and criticism, respectively). Additionally, four new direct paths emerged: in academia a negative path from Map to social comparison and, in sport settings, two positive paths from Pav to social comparison, and efficacy to planning/self-monitoring, and one negative path from efficacy to criticism.

Achievement Goals and Social Comparison. In line with theoretical predictions, Pap and Map had similar patterns of positive and null relations respectively with social comparison, in three out of four contexts (i.e. academic and sport settings in two countries). In contrast, in Romania, students' Map was an additional but negative predictor, and athletes' Pav (not Pap) was the only positive predictor of social comparison. While these new links are consistent with theoretical predictions (Elliot & Church, 1997) cultural and/or contextual factors may be responsible for these deviations. From a cultural perspective, in a COL country where the need for achievement promotes fear of normative failure (Zusho et al., 2005) and negative social feedback is avoided (Hamamura & Heine, 2008), social comparison serves different

purposes of engagement depending on the probability and implications of failure: in highly competitive contexts (such as elite sport) where the probability and cost of failure are high, individuals engage in social monitoring out of a desire to avoid (public) failure; on the other hand, in moderately competitive settings (such as academia) where the probability of failure is low involvement in social monitoring is influenced by the desire for success.

From a contextual perspective, in both domains, an explicit emphasis is placed on competition, ranking, extrinsic rewards and social comparison. However, there are important differences between these domains in the incentive value and the probability of success/failure. In high level sport only the top athletes or teams are considered successful and enjoy financial benefits. Romanian athletes who reached elite or sub-elite status have already demonstrated their superiority over most of their competitors and it is fear of losing this hard earned place that motivates their interest in social comparison. In Romanian universities, on the other hand, there are two easier standards of success: ‘good’ grades linked to monetary rewards and ‘pass’ grades. Therefore, Romanian students have an ambivalent attitude towards social comparison: a desire for getting and maintaining a position in the top fifty, makes social monitoring desirable and useful, while a focus on learning and understanding the course material in order to achieve good or pass grades makes attention to social comparison undesirable and disruptive as it draws attention away from task involvement.

Achievement Goals and Self-Efficacy. In line with theoretical predictions, Map was the main positive influence on goal efficacy, while Pap and Mav goals had little or no effect on confidence for athletes from both countries and English students (three out of four contexts). Regardless of personal goal content, a focus on the process of study or practice (i.e. learning and understanding the course material or improving the quality and consistency of sport skills), should ultimately lead to desired grades, ranking and personal bests. Since personal achievement is the main source of efficacy in education and sport settings (Bandura, 1997) a focus on personal improvement should also influence efficacy. However, this was not the case for Romanian students, for whom Map had a null relation with goal efficacy. This unexpected result may be explained by cultural or contextual influences.

In a COL culture, sources of efficacy perceptions may be more others- than self-oriented. According to Klassen (2004) ‘cultural practices and beliefs may influence the types of

information people attend to and use as indicators of personal efficacy (p. 739). Romanian students' efficacy perceptions may be shaped more strongly by others – how others are doing and what others tell them about their own ability to achieve. Moreover, from a contextual perspective, in Romanian universities extrinsic success is defined in terms of top ten and top fifty annual average grades, therefore success and financial rewards are somewhat uncertain since the threshold grade level that qualify students for rewards changes every year.

Finally, an interaction between cultural and contextual influences may also explain the different pattern of relations between goals, social comparison and efficacy. Pav may promote social comparison only in high level athletes socialised in the mould of COL values and norms. Winning may not be necessarily the name of the game for Romanian elite and sub-elite athletes, it may be better labelled 'not losing' (Hamamura & Heine, 2008). Moreover, students' mastery attempts may not give them confidence in their ability to achieve the grades and status expected of them; and their desire for success may promote an ambivalent attitude towards social comparison only in explicit competitive academic environments in COL cultures, when success is uncertain and carries important financial and emotional implications for students and their families.

Antecedents of Self-Motivation. Across domains and countries (four contexts), engagement in self-motivation strategies was determined by knowledge of progress based on self and social standards and goal efficacy level. Generally, satisfaction or dissatisfaction with self-referenced progress occasioned positive and negative self-reinforcement, while confidence reduced the likelihood of self-criticism. The latter effect was not found only in English university athletes for whom sport involvement is generally of secondary importance and little progress may not be worth criticising.

The effects of social comparison on self-consequating strategies and that of efficacy on self-reward varied between the two countries from positive in the UK to null in Romania, in agreement with COL-IND stereotypes. Negative feedback is regarded as useful in COL cultures while positive feedback is valued more in IND cultures (e.g. Heine, Takata & Lehman, 2000; White & Lehman, 2005). Therefore, for Romanians negative feedback occasioned no self-criticism, while positive feedback and confidence led to little or no self-

rewarding respectively. Conversely, the English rewarded satisfactory progress, criticised poor progress, and their confidence increased somewhat the likelihood of self-reward.

4.9. General Discussion

Cultural Variations in Achievement Goals and Self-Regulation. Study 3a provided for the first time an insight into cultural differences in achievement goals and SR between high level athletes from two European countries, after controlling for within-country variability in COL self-definition. This finer and sharper analysis revealed that: 1) cultural variations in ego-social (Pap and Pav) goals existed in line with the COL stereotype even after accounting for individual differences in COL self-views and other contextual influences such as sport type; 2) mastery goals (Map and Mav) were less prone to fluctuations due to cultural influences alone; differences in mastery goals were better explained by the idiosyncratic combination of cultural, contextual and individual differences (such as sport type, sport level, self-definition and possibly age or stage in athletic career), and 3) cultural variations in SR strategies should be understood in relation to the purposes of engagement which energise SR activity.

Achievement Goal Theory Implications. The current data confirms for the first time the centrality of social comparison to both performance goals regulation as an intentional progress monitoring strategy in a moderately COL culture. In line with the theoretical conceptualisation of performance goals, the action or the ‘how’ engendered by Pap and Pav goals was congruent with the intention or the ‘why’ embedded in them. However, this link appears to be moderated by the competitive nature of the context: Pap and Pav goals had different implications for social comparison in different contexts depending on the meaning, probability and incentive value of success and failure. Specifically, in highly competitive performance-oriented contexts such as high level sport in a COL culture, Pav goal is linked to some proactive SR.

Similar to studies 1 and 2 in the UK, Romanians’ efficacy and value perceptions seem to mediate (fully or partially) the effects of approach goals on planning and self-monitoring. Again, the nature of the context seems to moderate some of these relations. While Map and goal efficacy were consistently related to planning and self-monitoring indirectly through goal value (in both domains and countries), approach goals’ relations with goal efficacy varied

across domains and countries. The results of this study in a moderately COL culture, lends further support to recommendations made by others (e.g. Bouffard, Bouchard, Goulet, Denoncourt, & Couture, 2005; Harackiewicz & Sansone, 1991) to address the role of efficacy as well as value within the contemporary achievement goal theory.

Achievement Goals and Personal Goals. Most Romanian students and athletes set outcome or comparative performance-approach goals (82% in academia and 80% in sport settings), few mastery goals (4% and 18%) and only 10% of students (and no athletes) set performance avoidance goals (avoid failing exams). Most performance goals (80%) in elite sport settings were comparative in nature (e.g. winning, medals, promotion), while only 16% of academic goals belonged to this category (related to desired ranking or rewards). Similarly, university students from the UK (study 1) and other countries reported few or no avoidance and performance-comparative goals (e.g. Horowitz, 2010; Okun et al., 2006; Urdan, 2001). Moreover, elite and sub-elite Romanian athletes expressed all their personal goals in positive approach terms despite any tendencies towards avoidance motivation induced by a COL culture. On the other hand, the prevalence of self-set performance-comparative goals in sport settings seemed to be influenced by the level of competition – Romanian elite and sub-elite athletes were mostly concerned with winning, while most English university athletes (study 2) were not.

Qualitative investigations of achievement goal content have generally not supported the theorised four goal conceptualisation, leading some authors to question the external validity or phenomenological reality of achievement goals measured through questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006). The present findings provided some evidence that questionnaire evaluations overestimate the natural occurrence of performance-comparative goals in academia, and avoidance goals across domains and cultures (i.e. under conditions of high and low probability for failure). There are two possible explanations for these mixed findings in the achievement goal literature. The prevalence of performance goals in education varies from high to low depending on whether grades are classified as performance goals or not (Brophy, 2005; Grant & Dweck, 2003; Hulleman et al., 2010; Okun et al., 2006): 76 % of Romanian students and 68 % of English students (study 1) set grade-related performance goals. Secondly, the low incidence of avoidance and comparative

personal goals may be explained through the hierarchical reason-standard complex (Elliot et al., 2011): personal goals or standards may be mostly approach in nature because they can serve both approach and avoidance reasons; and performance-outcome standards (e.g. grades or personal bests in sport) can be used in the service of both Pap and Pav reasons.

Self-Regulation Model Implications. A comparison of Romanian and UK models in two settings provided evidence of cross-cultural generalisation for a good proportion of the SR model. Therefore, despite cultural differences in mean levels of goals and SR activity, achievement goals generate many similar SR processes across the two (IND and COL) European cultures. Specifically, when athletes and students function under the broad imperatives of personal improvement (Map goal), they: 1) set realistic and valued goals; 2) engage in planning for, monitoring and evaluation of goal progress in relation to self-referenced standards; and 3) attempt to control their effort and motivation through positive and negative self-reinforcement. Additionally, goal striving under the broad imperative of outperforming others had little effect on commitment to personal goals, but engendered progress monitoring and evaluation through social comparison, and effort regulation through some self-reward. Thus, a desire for self- or other-referenced success is conducive to a variety of adaptive SR strategies. On the other hand, individuals engaged in little or no SR when they were afraid of failure in relation to self or others (Mav and Pav goals). Finally, some cross-cultural and cross-domain variations existed in the relations between goals and SR which could be explained in terms of cultural values and beliefs, the competitive nature of the environment and/or the interaction between culture and context.

Although social-cognitive models of SR incorporate the social context as a component of self-directed behaviour, socially mediated factors assume an inferior status to individually based components (Jackson, Mackenzie & Hobfoll, 2000). Therefore, IND SR models confer a pivotal role to self-control, independence and self-reliance despite the fact that individuals do not function in isolation from each other in any culture. Jackson et al. (2000) proposed a more communal, 'self-in-the-social-setting' regulation concept which recognises that individuals' set goals, plan, monitor, evaluate and control their goal strivings within a network of socially mediated factors such as the goals, values, norms, expectations, standards and support emanating from family, organisations (school, sport club), and community. Future theorising

and research should recognise the important interaction between autonomy and relatedness in goal striving and SR efforts.

Limitations

Although the present study provided new insights into the relations between achievement goals, personal goal attributes, and SR processes, there are several limitations that should be considered. First, the correlational design employed in this study is a limitation because the concurrent collection of data does not allow causal or bi-directional interpretations of relations between model variables. The assumption that goals influence SR strategy use was based on the conceptualisation of achievement goals as broad cognitive frameworks (Elliot, 2005); however, SR models allow for cyclical and bidirectional links between model components (Pintrich, 2000a). Future research should employ longitudinal designs which allow for the examination of causal links between model variables. Second, the generalisation of the current findings is limited to: individuals from a moderately COL East European culture; university students on a Physical Education and Coaching Science degree; the moderately competitive context of Romanian higher education where evaluations are based on criterion grading and competition is explicitly encouraged through financial incentives; and high level elite and sub-elite sport contexts where few can succeed and enjoy substantial financial incentives. Future research should test the goal-strategy model in younger and older students and sport participants from other COL cultures. Third, the motivational climate, an important moderator of achievement goal effects, has not been investigated in this study. Its inclusion in future research is highly recommended in light of some evidence that SR activity is influenced by the interaction between personal and situational goals (Ommundsen, 2006; Theodosiou & Papaioannou, 2006).

Summary and Conclusion

In line with the etic-emic distinction in cross-cultural research (Headland, Pike & Harris, 1990), studies 3a and 3b provided an insight into both the universal (etic) and culture specific (emic) features of achievement goals and SR. Specifically, study 3a showed that cultural differences existed between elite and sub-elite athletes from IND and COL cultures in performance goals and related SR strategies (after controlling for variability in self-

definitions). Furthermore, study 3b demonstrated that: 1) the reasons, standards and action strategies of Romanian students and athletes are integrated in the meaning they construe for academic and sport engagement; and that 2) the integrated goal-strategy patterns generalise to a large extent across domains in a COL culture, and across IND and COL cultures. Study 3b supports the general theoretical prediction that approach goals engender more adaptive outcomes than avoidance goals (Elliot, 2005); it also supports the caveat that performance or ego-social goals' effects may vary according to context (Chong, 2007; Midgley, Kaplan & Middleton, 2001) and that even Pav goals can be a positive motivator of SR (Elliot & Covington, 2005) in some contexts (such as elite sport in a COL culture). More research is needed in order to understand the emic dimension or the subjective meaning of motivation and SR in different cultures (McInerney, 2008). Future studies in sport settings should investigate the effects of Pap and Pav goals on performance success, and the mediating role of SR processes such as social comparison and goal efficacy in elite athletes from different cultures.

The domain and cultural stability of the goal-strategy model lends further support to recommendations made by others (e.g. Elliot et al., 2011; Kaplan & Maehr, 2007) to integrate achievement goals, goal setting and SR strategies, and to develop a comprehensive goal-action regulation model capable of explaining with the why, the what and the how of achievement behaviour. Finally, there is some evidence that achievement goals are not static (e.g. Fryer & Elliot, 2007); however, the research design and analytic methods in the literature have not captured the changing nature of achievement goals and their implications for SR activity. Future studies should investigate the temporal dynamics of achievement goals, SR and the goal-strategy model in academic and sport domains.

CHAPTER 5. Study 4.

Temporal dynamics of achievement goals, self-regulation processes and their relationships in academic and sport settings

5.1. Introduction

Achievement goal research has flourished during recent years, however, the extant work has focused mainly on goal relations to various outcomes, and employed largely cross-sectional designs. There has been little longitudinal research on achievement goals (Fryer & Elliot, 2007), and even less on the temporal dynamics of achievement goal relations or the implications of goal changes for their outcomes (Shim, Ryan & Cassady, 2012). Thus our understanding of how achievement goals change, the implication of these changes for their outcomes, and the dynamics of achievement goals' relations are incomplete. Therefore, this study examined the temporal dynamics of achievement goals, SR processes, and their relations in two setting, using a longitudinal research design, latent growth curve analyses and structural equation modelling.

Changes in Achievement Goals

Achievement goals represent different orientations towards competence (Elliot, 2005) and have been conceptualised at different levels of generality. Goal orientations derived from a dichotomous model describe relatively stable differences in individuals' dispositions to adopt two goals in a life domain (e.g. education, physical activity) (Duda, 1989; Nicholls, 1984). On the other hand, goals derived from more recent three- and four-goal models (e.g. Elliot & Church, 1997; Elliot & McGregor, 2001; Elliot & Conroy, 2005) are conceptualised as context-specific states of goal involvement, hence they are more contextually and temporally specific. To avoid ambiguity, it is important to specify the generality level of the achievement goal conceptualisation adopted in research (Spray & Keegan, 2005); this issue becomes particularly important in studies of temporal stability. The present study adopted the four-goal model consisting of: performance approach (Pap; a focus on demonstrating normative

competence), performance avoidance (Pav; a focus on avoiding the demonstration of normative incompetence), mastery approach (Map; a focus on developing self-referenced competence), and mastery-avoidance (Mav; a focus on avoiding self-referenced incompetence); and achievement goals were operationalised in relation to two broad domains – education and sport.

There are some theoretical reasons and empirical findings that support both the stability and change of achievement goals over time. From a theoretical perspective goal stability is expected for two reasons – the nature of the goal construct and its dispositional antecedents. Firstly, the goal adopted establishes a cognitive framework for how the individuals interpret, experience, and respond to challenges to their competence (Ames, 1992; Dweck, 1986). This framework consists of ‘biased’ perceptual-cognitive processes that are likely to perpetuate the pursuit of the same goal, thus supporting the notion of goal stability. For example, in mastery and performance goals competence is framed in terms of intra- or inter-personal competence, therefore success or failure (i.e. development or demonstration of competence) whether attained or not will not change the standard or definition of competence.

Secondly, achievement goal theory predicts that goals are determined by relatively stable features of both the individual and the environment. Some examples of individual characteristics are: achievement motives (Elliot & Church, 1997), temperaments (Elliot & Thrash, 2002), competitiveness (Harackiewicz, Barron, Carter, Letho & Elliot, 1997) test anxiety (Elliot & McGregor, 1999) and theory of intelligence (Dweck & Leggett, 1988) (i.e. high achievement motive for success, low competitiveness and test anxiety and an incremental theory of intelligence encourage the pursuit of mastery goals). Additionally, some examples of environmental features are: evaluation structure, the style of instruction and the frequency of evaluation (Ames, 1992; Urda & Turner, 2005) (i.e. normative grading, competition and opportunities for social comparison encourage the pursuit of performance goals).

There are also reasons to expect goal changes. Firstly, achievement goals are important components of the SR process. According to Pintrich’s (2000a) model of SR, achievement goals activate or set in motion several SR processes such as: goal setting and planning,

monitoring and evaluation of goal progress, self-motivation strategies and finally reflections and reactions to goal progress or outcomes. The latter may lead to a revision or change of achievement goals. Several factors could prompt goal change: additional information about the task (e.g. difficulty level) and environment (e.g. tough competition) (Bong, 2005), performance feedback (Senko & Harackiewicz, 2005b), perceived competence changes (Muis & Edwards, 2009), and life events outside of the achievement domain. Specifically, difficult tasks, tough competition, negative feedback and low perceived competence may lead to an increase in avoidance goals and decrease in approach goals. Secondly, according to the hierarchical model of achievement goals, change is more likely to occur in goals with purely positive or negative antecedents – Map and Pav goals respectively, while goals with mixed antecedents – Pap and Mav goals are more likely to be stable (Elliot, 2005; Elliot & Church, 1997). Despite these arguments not much attention has been directed to the nature and implications of achievement goal changes (Fryer & Elliot, 2007; Shim et al., 2012).

The majority of existing studies investigated the developmental changes in achievement goals, within and between years, in elementary, secondary and high school. Studies that examined differential continuity based on correlations between measurement points in time evidenced moderate-to-high stability (Anderman & Anderman, 1999; Anderman & Midgley, 1997; Bong, 2005; Meece & Miller, 1999, 2001). The reasonable degree of stability evidenced by correlations does not exclude changes in means over time. Studies that examined mean level change showed consistently that Map declined (Anderman & Anderman, 1999; Anderman & Midgley, 1997; Chouinard & Roy, 2008; Meece & Miller, 1999, 2001; Paulick, Watermann & Nuckles, 2013; Shim, Ryan, & Anderson, 2008); while performance goal results were inconsistent – decreased (Meece & Miller, 1999; 2001), remained stable (Anderman & Midgley, 1997) or increased (Anderman & Anderman, 1999). When performance goals were differentiated into approach and avoidance components, both declined (Chouinard & Roy, 2008; Paulick et al., 2013; Shim et al., 2008). The results concerning goal stability during school years are diverse; endorsement of goals seems to be stable to some extent, but also to vary over time.

The transition to university level education and sport participation represents a significant change in context for first year students accompanied by a range of new challenges; higher standards of evaluation, higher levels of independent work/training, less tutor or coach support, and higher ability peers may lead students to recalibrate their perceptions of academic and sport competence. Few studies have investigated goal changes in university students or physical activity participants. During one semester, students' Map and both performance goals changed (decreased and increased respectively), or were stable (Fryer & Elliot, 2007; Jagacinski, Kumar, Boe, Lam & Miller, 2010; Muis & Edwards, 2009; Senko & Harackiewicz, 2005b), and Mav goals were stable (Fryer & Elliot, 2007; Jagacinski et al., 2010). Over one academic year, mastery approach goals decreased, while both performance goals were stable (Shim et al., 2012).

In secondary school physical education, Map and Pav goals declined, whereas Pap and Mav goals declined or remained stable, over a period of nine or twelve months (Warburton & Spray, 2008, 2009); task orientation was stable and ego orientation declined during one year (Xiang, McBride & Guan, 2004); and both goal orientations declined over three years (Barkoukis, Ntoumanis & Thogersen-Ntoumani, 2010).

In conclusion the existing evidence seems to suggest that both university and physical education students' goals may or may not fluctuate as they accumulate experience with tasks, instructions and evaluation standards, yet the general trend appears to be one of decline or stability during one year. *The first purpose of this study was to investigate achievement goal changes during one year in a sample of first year university students, in two contexts, using latent growth curve analyses.*

Implications of Achievement Goal Changes for Self-Regulation Changes

Changes in Self-Regulation Processes. Conceptualisations of SR vary in grain size from very large, as aptitudes to very small, as events (Winne & Perry, 2000; Winne, & Stockley, 1998). In this study, SR was operationalized as an aptitude which means that participants generalized their actions across a multitude of events. SR as an aptitude can vary within individuals,

across settings and over time, and between individuals (Boekaerts & Cascallar, 2006; Pintrich, 2000a; Winne & Perry, 2000).

The arguments for stability and change presented for achievement goals are also valid for the SR processes or mechanisms through which goals exert their influence on various outcomes. Considering that achievement goals create a framework through which individuals interpret situations and process feedback information (Duda & Nicholls, 1992; Dweck & Leggett, 1988), as well as the cyclical nature of SR (Zimmerman & Kitsantas, 2005), changes in achievement goals could lead to similar dynamics in the SR processes emanating from them.

In the academic domain, there is some evidence that the efficacy and use of SR, efficacy, competence, and value beliefs change over time: senior school students' academic self-efficacy decreased and the use of self-handicapping strategies increased over a period of six months (Smith, Sinclair & Chapman, 2002); high school students' maths competence and value declined over one year (Chouinard & Roy, 2008), and students' perceived efficacy for SR learning, decreased over a decade (Caprara, Fida, Vicchione, Del Bove, Vecchio, Barbaranelli & Bandura, 2008).

In the physical activity domain, perceived competence and value of physical education and sport declined during one year (Papaioannou, Marsh & Theodorakis, 2004; Rodriguez, Wigfield & Eccles, 2003; Xiang et al., 2004); furthermore, adaptive and maladaptive cognitions and behaviours (e.g. efficacy, value, planning, task management, self-handicapping, disengagement) related to physical activity participation during one year after high school demonstrated modest stability with an average of 19% of variance shared between two times (Martin, 2010). In conclusion, the existing evidence supports the notion that self-efficacy and value beliefs, and the use of SR strategies change over time.

Implications of Achievement Goal Changes. Little attention has been directed to the implications of achievement goals changes in the academic domain (Fryer & Elliot, 2008; Shim et al., 2012) and even less in the sport domain. The sparse evidence showed that changes in mastery and performance approach goals were related to the level of and/or

changes in self-esteem, normative contingencies of self-worth, normative perceived competence, self-efficacy, use of active learning strategies and academic performance (Jagacinski et al., 2010; Meece & Miller, 2001; O’Keefe, Ben-Eliyahu & Linnenbrink-Garcia, 2013; Shim et al., 2008; 2012), and Mav change was linked to changes in external regulation and amotivation in swimmers (Conroy, Kaye & Coatsworth, 2006). *The second and third purposes of this study were to investigate temporal changes in SR processes, and the relationships between growth parameters of four achievement goals and SR, in two settings, through latent growth curves analyses.*

The Relations between Achievement Goals and Self-Regulation: Time Invariant?

The first two cross-sectional studies of this thesis evidenced specific links between the four achievement goals and six SR processes for student-athletes and exercisers. For example, mastery approach goal predicted personal goal commitment (i.e. goal efficacy and value) and planning/ self-monitoring strategies, performance approach goal predicted social comparison, and both goals predicted indirectly self-motivation strategies (self-reward and self-criticism). The question remains whether the relations between goals and SR are stable or change over time. The exiting evidence seems to indicate that achievement goals relations with variables such as self-esteem (Shim et al., 2012), contingencies of self-worth (O’Keefe et al., 2013) and academic performance (Paulick et al., 2013) were stable over three measurement waves during one year. On the other hand, Shim et al. (2008) reported variable relations between goals and academic achievement at four time points six months apart (i.e. significant between some and null between others). *The fourth purpose of this study is to investigate the temporal invariance of achievement goal relations with SR processes through structural equations modelling.*

Summary and Hypotheses

The literature investigating achievement goal changes is limited. Most studies focused on developmental changes in children and adolescents during school years, and only a few adopted a goal regulation perspective with an adult population of university students. Furthermore, the latter group of studies focused on: a) a fairly short period of time, one

semester, rather than a whole academic year; b) a narrow, subject-specific (mostly introduction to psychology courses) rather than a broad domain-general conceptualization of achievement goals (Shim et al., 2012 is an exception on both counts); and c) only mastery approach, performance approach and performance avoidance goals (Map, Pap, Pav), most leaving out mastery avoidance goal (Mav). In the physical activity domain, there are only a few studies on developmental goal changes in school physical education, and no studies on goal regulation in adult sport participants. Additionally, there are no studies in the literature that investigated changes in SR strategy use, and the associations between changes in achievement goal and SR processes.

Therefore, this study focused on changes in achievement goals and SR processes, and the dynamic of their relationships during the first year at university, in both academic and sport settings. This study makes important contributions to the literature in both domains by investigating: 1) changes in four goals (conceptualized at domain level), over one academic year (rather than one semester); 2) changes in the goals of adult sport participants (rather than children and adolescents); 3) changes in SR processes; 4) the associations between changes in achievement goals SR processes; and 5) the temporal invariance of the goal-strategy model paths.

In both settings during one academic year it is hypothesised that: 1) achievement goals decline or remain stable; 2) SR processes decline or remain stable (this is a tentative hypothesis due to insufficient literature); 3) the growth parameters of approach goals and SR processes will be related; no significant relation will be found between the growth parameters of Mav and SR processes; 4) the relations between achievement goals and SR processes identified in studies 1 (education) and 2 (sport) remain stable over time (see hypothesized academic and sport domain models in figure 5.1).

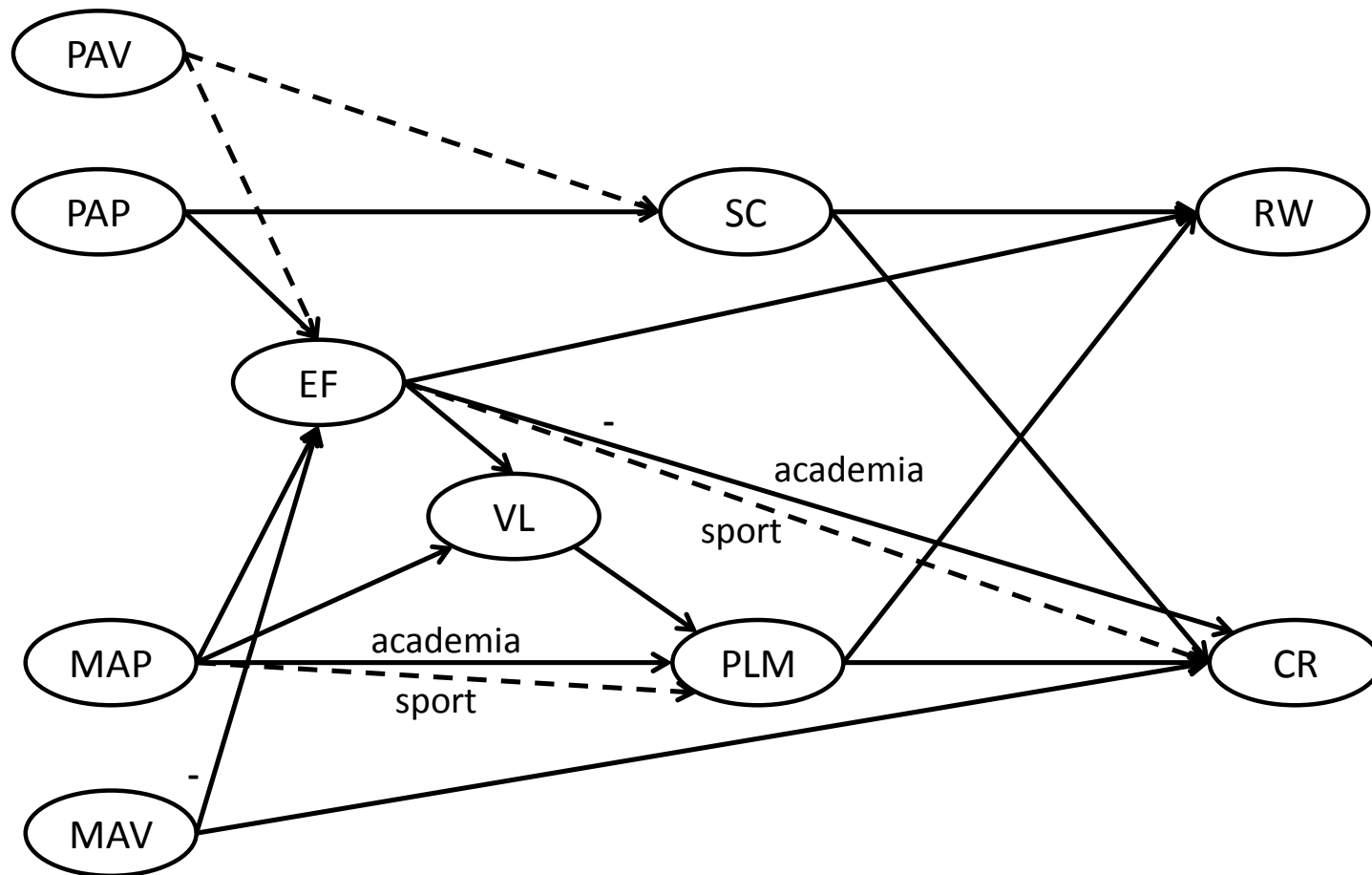


Figure 5.1. The hypothesised academic and sport models (dashed line - non significant paths)

PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism

5.2 Method

Participants and Procedure

The academic sample comprised 295 first year students (M age = 18.5 years, SD = 1.7); 144 females (49%) and 151 males (51%); N= 270 (92%) at time 1, N = 265 (90%) at time 2 and N=255 (86%) at time 3. The sport participants sample consisted of 288 student-athletes; 140 females (49%) and 148 males (51%); N = 264 at time 1 (92%), N=251 at time 2 (87%) and N=242 at time 3 (84%). All participants were Caucasian.

All participants independently completed a 20-minute questionnaire pack during a class, three times during year one, at approximately 4-month intervals: during the first or second week of semester 1 (T1 October) and during the last week of semesters one and two before the exam period (T2 January and T3 May). Before completing the survey pack students were provided with a brief explanation of the purpose of the study and were assured that their responses would remain confidential. Ethical committee approval for the research procedure, which complied with the guidelines of the British Psychological Society, was received from the relevant institutional body before data collection.

Measures

Achievement Goals in Education. The Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) was developed to assess students' achievement goals; it comprises 12 items and measures four goals: mastery-approach (e.g. 'I want to learn as much as possible from this course'), mastery-avoidance (e.g. I worry that I may not learn all that I possibly could on this course'), performance-approach (e.g. 'It is important to me to do better than other students') and performance-avoidance (e.g. 'I just want to avoid doing poorly on this course'). The answer scales ranges from 1 (Not at all like me) to 7 (Completely like me) (see appendix 1). The authors reported adequate confirmatory validity and reliability indices with American undergraduate students. The original questionnaire measures students' goals in relation to a specific subject of study by making references to 'this class'. In the present study, students'

goals for the academic domain were measured through references to ‘this degree’ as the intention was to concentrate on broad domain – general achievement goal.

Achievement Goals in Sport. The Achievement Goals Questionnaire for Sport (AGQ-S; Conroy, Elliot & Hofer, 2003) developed to assess sport participants’ achievement goals; it comprises 12 items and measures four goals (three items per goal): mastery-approach (e.g. ‘It is important to me to perform as well as I possibly can’), mastery-avoidance (e.g. ‘I worry that I may not perform as well as I possibly can’), performance-approach (e.g. ‘It is important to me to perform better than others’), and performance-avoidance (e.g. ‘I just want to avoid performing worse than others’). The answer scale ranged from 1 (not at all like me) to 7 (completely like me) (see appendix 3). The authors reported good confirmatory validity and reliability indices in samples of American student-athletes.

Personal Goal Attributes and Motivational Regulation Strategies. Students identified their most important goal in one domain (i.e. academic or sport) for the current semester, and then completed the Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995) in relation to this goal (see Appendix 2). The second completion of the GSAB was related to their most important goal in the second domain (i.e. sport or academic). The six scales used in this study measured two personal goal characteristics (four items each) – goal *value* (e.g. ‘This goal is valuable to me’) and goal *efficacy* (e.g. ‘I have the ability to reach this goal’), and four self-regulation strategies (a composite planning/self-monitoring scale with six items and three scales with four items each): *planning* – refers to planning process steps, scheduling activities and preventing interference from other goals or people (e.g. ‘I try to plan in advance the steps necessary to reach this goal’), *self-monitoring* – refers to awareness of progress or successes and day-to-day behaviour (e.g. ‘I keep track of my overall progress on this goal’ and ‘I am aware of my day-to-day behaviour as I work towards this goal’); *social comparison* – refers to the monitoring of one’s progress in comparison with others of similar ability, who are working on a similar goal, and are doing better or worse than oneself (e.g. ‘I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing better [worse] than I am’); *self-reward* – refers to the use of positive reinforcement for satisfactory goal progress and hard work (e.g. ‘I reward myself when I make progress toward this goal’),

and *self-criticism* – refers to verbal punishment for unsatisfactory progress or insufficient effort (e.g. I tend to criticize myself when I'm not making progress toward this goal'). Students were asked to indicate how well each statement described their work on their most important goals on a scale ranging from 0 to 4 (0 = Not at all; 4 = Extremely). The authors reported adequate confirmatory validity, reliability and social desirability indices in the academic and fitness domains.

Data Analysis

In longitudinal research it is common to have attrition over time (Hansen, Tobler & Graham, 1990). In this study, data were missing due to absences on the days of questionnaire administration. Out of 295 students, 201(68%) had complete data and 94 (32%) missed one completion; out of 288 athletes, 181 (63%) had complete data and 108 (37%) missed one measurement occasion. Specifically the attrition rate was: 8/8% (education/sport) at time 1, 10/13% at time 2, and 14/16% at time 3. Based on literature recommendations (Bollen & Curran, 2006; Shim et al., 2012), independent t-tests were carried out between individuals with complete and incomplete data on all variables of interest; the non-significant differences ($t < |1.62|$, $p = ns$) indicated that the data could be considered missing at random (MAR) (Bailey & Russell, 2010). Full Information Maximum Likelihood (FIML) estimation was used to capitalize fully on the available data (Enders & Bandalos, 2001). The rigor of this approach was demonstrated even with substantial missing data (Byrne, 2001). All analyses in this study were carried out using EQS 6.1 software (Bentler & Wu, 2002).

Preliminary Analyses: Longitudinal Invariance and Factorial Validity

Longitudinal Factorial Invariance (LFI) In line with previous research, the LFI of individual models for achievement goals and SR processes were assessed using a series of nested models with increasingly restrictive constraints on model parameters (e.g. Conroy, Kay & Coatworth, 2003): configural invariance (same factor structure), weak factorial invariance (additional constraints on item-factor regression coefficients); strong factorial invariance (additional constraints on item intercepts) and strict factorial invariance (additional constraints on

uniquenesses). The configural invariance model was used as a baseline for subsequent comparisons. According to Sayer and Cumsille (2001), strong factorial invariance is considered sufficient for comparisons across time points.

Confirmatory Factor Analyses (CFA). CFAs were employed in order to assess the factorial validity of each questionnaire at each time point. For both CFAs and LFIs model fit was evaluated through a combination of relative (i.e. NFI, NNFI, CFI) and absolute (i.e. RMSEA) fit indices. Additionally, due to the small sample size in this study, the ratio between chi-square and degrees of freedom (χ^2/df) was used as a fit index; according to Chou and Bentler (1995) the chi-square statistic is often misleading due to its sensitivity to sample size. A ratio χ^2/df lower than 3 (Kline, 1998) and NFIs, NNFIs and CFIs values at or greater than .90 and .95 are typically taken to reflect acceptable and excellent fit to the data (McDonald & Marsh, 1990); RMSEA values at or less than .05 and .08 are taken to reflect a close and reasonable fit, respectively (Jöreskog & Sörbom, 1993; Marsh, Bella & Hau, 1996). To evaluate the fit of nested invariance models, changes in relative fit indices were examined; changes greater than .01 indicated that the null hypothesis of invariance should be rejected and that the less constrained model is more appropriate (Cheung & Rensvold, 2002).

Main Analyses

Latent Growth Curve (LGC) Analyses. *Unconditional LGC* analyses (e.g. Duncan, Duncan & Stycker, 2006) were employed to test changes in each of four achievement goals and four SR processes (goal commitment – a composite measure of goal efficacy and value; planning/self-monitoring, social comparison and self-consequating – a composite measure of self-reward and self-criticism). The creation of two composite SR measures was deemed appropriate as each of these pairs of variables played similar roles in the goal – SR models in studies 1 and 2 (i.e. had similar relations with their antecedents). Two latent variables were specified from three repeated measures; the first factor is the intercept and it represents the mean baseline of each variable (T1). The second factor is the slope which indicates the rate of change per time unit. In order to capture accurately the pattern of change both linear and non-linear LGC models were tested for all variables. The interpretation of the slope depends on the time

function. In linear models change is considered to be consistent over time (50% T1 – T2 and 50% T2 – T3). However, this trend may not fit the data for all variables; in such cases it is appropriate to estimate a model with an unspecified time growth trend (Meredith & Tisak, 1990) in which the time function is estimated from the data. For each variable, two different LGC models were specified, starting with a linear growth rate followed by an unspecified (free-loading) growth rate (Bollen & Curran, 2006). In the linear models, the first loading in the slope factor was fixed to 0, the second to 1 and the third to 2; in the non-linear model the first loading was fixed to 0, the third to 1 and the remaining second loading was freely estimated. The estimated value of the second factor loading indicates the amount of change occurring between T1 and T2 relative to the overall amount of change (i.e. 100%) occurring between T1 and T3. For example, a value of .30 means that 30% of change occurred from T1 to T2 and the rest, 70% from T2 to T3. Additionally, when an inspection of means suggested that neither a linear nor a free-loading models were appropriate, other non-linear models were tested, for example quadratic (loadings of 0, 1, 4) or mixed change models (e.g. 0, 1, 1, change then plateau).

Finally, *associative LGC* modelling (Duncan et al., 2006) was used to test the relations between change parameters (intercepts and slopes) of one achievement goal and two or three relevant SR processes (only variables with significant inter-individual variance identified in previous LGC analyses were eligible for associative modelling). All LGC models' fit were evaluated based on the following indices: Yuan-Bentler scale statistic (Y-B χ^2) is analogous to the S-B χ^2 when data are both incomplete and non-normally distributed (with Robust specification and SE = Observed because this sample is relatively small); from the category of comparative fit indices CFI was preferred to NFI as it considers the sample size, and was recommended by Bentler (1990); RMSEA was selected from the absolute fit indices group based on recommendations made by MacCallum and Austin (2000); and finally, the Consistent Akaike's Information Criterion (CAIC; Bozdogan, 1987) was selected to address the issue of parsimony in the assessment of model fit; that is, statistical goodness-of-fit as well as the number of estimated parameters are taken into account (Byrne, 2006). CAIC was preferred to AIC because it takes into account the sample size in addition to degrees of

freedom (Bandalos, 1993). CAIC is used in comparison of two models, with lower values representing a better fit to the hypothesized model (Hu & Bentler, 1999).

Structural Equations Modelling (SEM). SEM was employed to evaluate the fit of the hypothesized goal-strategy model at each time point in each setting; then the temporal invariance of the model across measurement occasions was tested with constraints imposed on factor loadings and factor paths. Model fit was evaluated based on relative and absolute fit indices (i.e. χ^2/df ; NNFI, CFI, RMSEA and 90%CI). As studies 1 and 2 evidenced no relations between Pav goal and SR processes with English samples, this goal was not included in the SEM analyses.

5.3. Results

Preliminary Analyses

Descriptive Statistics. Tables 5.1 and 5.2 present the means, standard deviations and Cronbach alpha coefficients for all variables at three wave of measurement in academic and sport settings, respectively. Each scale exhibited acceptable internal consistency (i.e. Cronbach's alpha exceeded .70) at each time point.

Factorial Validity and Longitudinal Invariance. The LFI analyses assessing the structural stability and invariance of responses to each scale showed that according to relative fit criteria (i.e. changes in NFI, NNFI and CFI indices between models with increasing constraints were no more than .01): academic Mav and sport Pav goals achieved strong factorial invariance while all the other goals achieved strict factorial invariance (see table 5.3 results in italics); in both settings, goal efficacy, goal value and self-criticism achieved strict factorial invariance, and planning /self-monitoring, social comparison and self-reward achieved strong factorial invariance (see table 5.4 results in italics). In both domains, RMSEA values of strong and strict models were the same or better than those of the configural and weak models for three achievement goals and all SR scales. Finally, the ratio between chi-square and degrees of freedom (χ^2/df) was lower than 3 for all models, with three exceptions: sport Pap (configural model $\chi^2/df = 3.3$), academic Map (strong model $\chi^2/df = 3.1$) and academic Mav (strict model $\chi^2/df = 3.2$). Overall, LFI analyses revealed a good longitudinal factorial invariance for all goals and SR processes in both settings.

The CFA results for each questionnaire in each setting indicated that the expected factor structure (four goals and six SR processes) exhibited an acceptable or good fit to the data at each measurement occasion (see table 5.5): $\chi^2/df = 1.3$ to 2.2 ; NNFI = .92 to .97; CFI = .93 to .98; RMSEA = .03 to .07, 90% CI = .03 – .08.

Main Analyses

Achievement Goals Changes: Unconditional Linear Growth Models

Fit Indices. Linear and non-linear LGC models were tested for each of the four goals in each domain (see tables 5.6 and 5.7). The non-linear model had the second loading of the slope factor freely estimated. Both models demonstrated good or excellent fit to the data; for linear models most chi-square values were non-significant (the exceptions were academic Map and Mav goals, and sport Pav, $p < .05$); CFI = .95 to 1.00; RMSEA = .00 to .08; for non-linear models all but one chi-square value were non-significant (academic Map: $\chi^2_{(2)} = 12.32$, $p < .01$), CFI = .99 to 1.00; RMSEA = .00 to .08. CAIC values were generally lower for non-linear models; the only exception was sport Pav with a slightly higher CAIC (but better values for the other three fit indices). The non-linear models provided a somewhat better fit to the data, therefore only their results will be reported below.

Fixed Growth Parameters: Sample Mean Changes. As can be seen in tables 5.6 and 5.7, the average intercept indicated that student-athletes started the academic year with moderate-to-high levels of goal endorsement: Map was the highest in both settings (17.7 and 18.5 in academia and sport respectively), while the lowest endorsed goals were academic Pap (12.8) and sport Pav (12.1). Furthermore, the average slopes were significant and negative indicating a decline from T1 to T3 in the endorsement of all goals in sport ($z = -.51$ to $-.90$) and two academic goals, Map ($z = -1.12$) and Pav ($z = -.76$). The amount of change that occurred during semester 1 (T1 – T2) relative to the overall amount of change that occurred over both semesters (T1 – T3) showed a goal decline: in academic settings Map 58% and Pav 99%, and in sport settings Pap 72%, Pav 76%, Map 48% and Mav 61%.

Random Growth Parameters: Individual Differences in Change. There was significant variability in the individuals' initial levels and rate of change of achievement goals in both settings (see tables 5.6 and 5.7), with one exception: a non-significant variance of slope for academic Mav; hence students started the academic year with different levels of goal endorsement and continued to differ in their rate of change in both settings with one exception, their changes in academic Mav over time were similar. Finally, only one intercept-slope covariance term was significant: the start level and change over time of sport Pav goal were

negatively related (i.e. athletes with higher Pav start levels changed at a lower rate than athletes with lower baselines).

Self-Regulation Change: Unconditional Linear Growth Models

Fit Indices. Linear and non-linear LGC models were tested for each of the four SR process in each domain (see tables 5.6 and 5.7). As before, the non-linear model had the second loading of the slope factor freely estimated for all but two SR variables. An inspection of self-consequating mean scores in each setting suggested that different non-linear models were a better representation of change: a quadratic model (slope loadings of 0, 1, 4) in the academic domain, and a mixed model in the sport domain (slope loadings of 0, 1, 1, indicating change from T1 to T2 and a no change from T2 to T3). For brevity, the models tested for self-consequating will be referred to as non-linear models when reporting the results. For all but two variables, both models demonstrated a good or excellent fit to the data in both domains: non-significant chi-square, CFI = .97 to 1.00; RMSEA = .00 to .07. In sport settings, the non-linear model for planning/monitoring had better fit indices than the linear model (non significant vs. significant chi-square; CFI = .96 vs. .90 and RMSEA = .07 vs. .08). The opposite was the case for social comparison in both settings: the linear model represented a better fit in the academic domain (non significant vs. significant chi-square, CFI= .98 vs. .82, RMSEA = .05 vs. .10) and sport domain (both chi-square non-significant; CFI = 1.00 vs. .99 and RMSEA = .03 vs. .00). Overall the non-linear models produced better fit indices than the linear models (with the exception of academic and sport social comparison) as shown by indices reported above and the very similar or lower CAIC values (the exception was planning/monitoring in both settings with a slightly higher CAIC values). Therefore, only the results of non-linear models will be reported below.

Fixed Growth Parameters: Sample Mean Changes. The average intercepts showed that in both domains (academic/sport) student-athletes started the year with moderate-to-low levels of SR (goal commitment was moderate $M = 25.6/24.8$ and social comparison was very low $M = 6.3/6.6$) (see tables 5.6 and 5.7). Moreover, the average slopes of the non-linear models for all variables indicated: a decline between T1 and T3 in goal commitment in both settings

($z = -1.39$ education; $z = -1.13$ sport) and sport self-consequating ($z = -.85$); an increase in the use of social comparison and self-motivation in academia ($z = .88$ and $z = .84$); and no change in planning/monitoring in both settings (education $z = -.25$ and sport $z = -.37$ $p > .05$) and sport social comparison ($z = -.45$), although a negative trend was noted in all three. Specifically, the amount of change that occurred during semester 1 (T1 – T2) relative to the overall amount of change that occurred over both semesters (T1 – T3) in education was a decline of 54% in goal commitment, and an increase of 50% in social comparison and 20% in self-motivation; in sport a decline in goal commitment of 34% and self-motivation of 100%.

Random Growth Parameters: Individual Differences in Change. The variance terms demonstrated significant individual differences in baseline levels (T1) for all SR variables in both settings. Furthermore, student-athletes' rate of change differed over the year for goal commitment and planning/monitoring in academia, and planning/monitoring and social comparison in sport. Finally, two covariances between intercepts and slopes were significant in sport: changes in planning/monitoring and social comparisons were negatively associated with their start levels (those athletes who started with higher levels on these variables had a slower rate of change than those who started with lower baselines) (see tables 5.6 and 5.7).

Achievement Goals and Self-Regulation Changes: Associative Growth Models

Based on the results of unconditional LGC analyses (i.e. significant individual differences in growth terms) and associations found between goals and SR variables in studies 1 and 2, five associative growth models were tested including: Map and three SR processes – goal commitment, planning/self-monitoring, and self-motivation (model 1 in education, model 2 in sport), Pap and two SR processes – social comparison and self-motivation (model 3 in education and model 4 in sport) and Mav with three SR processes in sport (model 5). All models had acceptable fit indices; model 1: $\chi^2_{Y-B} = 112.30$ $df = 53$ $p < .001$, CFI = .97, RMSEA = .04, 90%CI = .02 - .06; model 2: $\chi^2_{Y-B} = 315.00$ $df = 54$, $p < .001$, CFI = .97, RMSEA = .04, 90%CI = .02 - .06; and model 3: $\chi^2_{Y-B} = 58.87$ $df = 29$, $p < .0005$, CFI = .97, RMSEA = .05, 90%CI = .04 - .08; model 4: $\chi^2_{Y-B} = 72.01$ $30df$ $p < .0001$, CFI = .98,

RMSEA = .04 CI 90% = .01 – .07; model 5: $\chi^2_{Y-B} = 153.44$ df = 54 $p < .0001$, CFI = .98, RMSEA = .03, CI 90% = .00 - .05).

Covariances between the intercepts and slopes of achievement goals and the slopes of SR are of particular importance in these analyses, and therefore only these results are reported. Models 1 and 2 were very similar (see figure 5.2 continuous lines): Map slope was positively related to the slopes of goal commitment and planning/monitoring (declines in Map are paralleled by declines in SR) in both domains (academia/sport: $z = 4.96/3.01$ and $z = 2.92/2.15$ respectively). Additionally, changes in planning/monitoring were associated with both the initial level and change rate in goal commitment (Intercept $z = -3.43/-5.01$ slope $z = 5.82/10.15$); changes in planning/monitoring and self-motivation were also positively associated ($z = 1.25/5.84$). In education, in addition to the positive slope associations, negative links existed between intercepts and slopes for the following pairs of variables: Map and planning/monitoring ($z = -1.14$) and planning/monitoring and self-motivation ($z = -.62$) (see figure 5.2 dashed lines). In sport settings changes in Map and goal commitment are also negatively associated with changes in self-motivation ($z = 2.11$ and $z = 4.96$) (see figure 5.2 dotted lines). Models 2 and 3 were identical in the two domains (see figure 5.3) and demonstrated the existence of positive associations between the following slopes: Pap and social comparison (academia/sport $z = 2.40/2.22$), Pap and self-motivation ($z = .85/4.69$), and social comparison and self-motivation ($z = .69/3.15$). Model 4 produced no associations between the intercepts and slopes of Map and SR processes.

Invariance of Achievement Goals and Self-Regulation Model: Structural Equations Modelling

SEM analyses conducted to assess the fit of achievement goals and SR models at each time point produced acceptable fit indices in both settings (i.e. NNFI and CFI values between .90 and .96). Next, SEM was conducted simultaneously across time points (with equality constraints imposed on factor loading and factor paths) in each setting, and produced acceptable fit indices (i.e. NNFI and CFI values of .94 or .95, and RMSEA values lower than .05) (see table 5.8). These results demonstrated the temporal invariance of most hypothesized achievement goal paths to SR processes in each domain with two exceptions: first, self-

efficacy did not predict the two self-motivation strategies in academia, while in sport settings, it did not predict self-reward; second, the path from Pap to self-efficacy was not significant in sport settings (see figure 5.4). The standardized path coefficients and R^2 for both domains are presented in table 5.9.

Table 5.1. Descriptive statistics for all variables across three measurement times in the academic domain

	Range	Time 1 M	SD	Alpha	Time 2 M	SD	Alpha	Time 3 M	SD	Alpha
Total N = 295		N = 270			N = 265			N = 255		
Performance-Approach	3 – 21	12.79	4.20	.88	12.71	4.10	.89	12.87	4.21	.89
Performance-Avoidance	3 – 21	14.33	3.94	.70	13.48	4.14	.75	13.69	4.33	.78
Mastery-Approach	3 – 21	17.80	2.52	.73	17.08	2.69	.77	16.72	2.70	.78
Mastery-Avoidance	3 – 21	13.98	3.44	.72	13.83	3.74	.85	13.72	3.60	.82
Goal Efficacy	0 – 16	11.74	2.15	.82	11.51	2.08	.81	11.15	2.50	.90
Goal Value	0 – 16	13.82	2.14	.83	13.37	2.23	.83	13.10	2.17	.84
Goal Commitment	0 – 32	25.56	3.33	.83	24.88	3.44	.82	24.25	3.80	.86
Planning/Self-Monitoring	0 – 24	14.18	3.12	.72	14.19	3.20	.75	13.82	3.07	.75
Social Comparison	0 – 16	6.32	3.51	.80	6.32	3.46	.85	7.15	3.39	.84
Self-Reward	0 – 16	1.91	3.15	.84	1.96	3.30	.90	2.00	3.36	.89
Self-Criticism	0 – 16	1.75	3.25	.83	1.83	3.25	.85	1.97	3.20	.85
Self-Motivation	0 – 32	14.99	5.08	.83	15.17	5.03	.87	15.89	5.03	.87

Table 5.2. Descriptive statistics for all variables across three measurement times in the sport domain

	Range	Time 1 M	SD	Alpha	Time 2 M	SD	Alpha	Time 3 M	SD	Alpha
Total N = 288)		N = 264			N = 251			N = 242		
Performance-Approach	3 – 21	13.43	4.23	.87	13.04	4.37	.91	12.69	4.55	.91
Performance-Avoidance	3 – 21	12.02	4.56	.83	11.40	4.39	.84	11.35	4.56	.88
Mastery-Approach	3 – 21	18.47	2.55	.79	18.10	2.41	.78	17.55	2.84	.82
Mastery-Avoidance	3 – 21	15.66	3.74	.88	15.17	3.66	.88	14.69	3.77	.85
Goal Efficacy	0 – 16	11.93	2.22	.80	11.86	2.10	.82	11.73	2.32	.83
Goal Value	0 – 16	12.86	2.53	.87	12.46	2.51	.88	11.97	2.57	.88
Goal Commitment	0 – 32	24.79	3.83	.85	24.32	3.74	.85	23.70	4.35	.85
Planning/Self-Monitoring	0 – 16	13.77	4.12	.80	13.37	3.75	.80	13.53	3.76	.80
Social Comparison	0 – 16	6.74	4.13	.77	6.24	3.83	.86	6.25	3.93	.89
Self-Reward	0 – 16	1.92	3.57	.88	1.89	3.51	.89	1.93	3.24	.87
Self-Criticism	0 – 16	2.05	3.80	.87	1.82	3.57	.86	1.75	3.65	.87
Self-Motivation	0 – 32	15.88	5.72	.87	14.86	5.53	.87	15.12	5.40	.86

Table 5.3. Longitudinal factorial invariance: Robust fit indices for achievement goals in two domains.

		Academic Domain					Sport Domain			
	S-B χ^2/df	NFI	NNFI	CFI	RMSEA (90% CI)	S-B χ^2/df	NFI	NNFI	CFI	RMSEA (90% CI)
Performance-Approach										
Configural	1.9	.98	.98	.99	.06 (.02 - .09)	3.3	.97	.95	.98	.09 (.06 - .12)
Weak	1.6	.98	.99	.99	.04 (.01 - .07)	3.0	.97	.96	.98	.08 (.06 - .11)
Strong	1.6	.98	.99	.99	.05 (.01 - .07)	2.9	.96	.95	.98	.09 (.06 - .10)
<i>Strict</i>	1.4	.98	.99	.99	.04 (.00 - .07)	2.7	.96	.95	.97	.08 (.06 - .10)
Performance-Avoidance										
Configural	1.8	.98	.97	.99	.05 (.02 - .08)	1.9	.98	.98	.99	.06 (.02 - .09)
Weak	1.7	.97	.98	.99	.05 (.02 - .08)	1.7	.98	.98	.99	.05 (.01 - .07)
<i>Strong</i>	2.3	.97	.97	.98	.06 (.03 - .08)	2.2	.98	.98	.99	.05 (.02 - .08)
<i>Strict</i>	2.9	.96	.97	.98	.05 (.03 - .08)	2.8	.96	.96	.98	.08 (.06 - .09)
Mastery-Approach										
Configural	1.4	.97	.98	.99	.04 (.00 - .07)	2.2	.95	.93	.97	.06 (.03 - .09)
Weak	1.3	.96	.98	.99	.03 (.00 - .06)	1.9	.94	.95	.97	.06 (.03 - .08)
Strong	3.1	.95	.96	.98	.05 (.02 - .08)	2.9	.94	.93	.96	.06 (.04 - .09)
<i>Strict</i>	2.8	.95	.97	.99	.04 (.00 - .06)	2.3	.94	.95	.97	.05 (.03 - .07)
Mastery-Avoidance										
Configural	2.3	.97	.96	.98	.07 (.04 - .09)	0.9	.99	1.00	1.00	.00 (.00 - .05)
Weak	2.7	.96	.96	.98	.07 (.04 - .09)	0.9	.99	1.00	1.00	.00 (.00 - .04)
<i>Strong</i>	2.3	.96	.95	.97	.07 (.04 - .09)	1.2	.99	1.00	1.00	.00 (.00 - .06)
<i>Strict</i>	3.2	.92	.90	.94	.09 (.07 - .11)	1.3	.98	1.00	1.00	.02 (.00 - .05)

Table 5.4. Longitudinal factorial invariance: Robust fit indices for self-regulation in two domains.

		Academic Domain					Sport Domain				
		S-B χ^2/df	NFI	NNFI	CFI	RMSEA (90% CI)	S-B χ^2/df	NFI	NNFI	CFI	RMSEA (90% CI)
Goal Efficacy	Configural	2.8	.93	.91	.94	.08 (.06 - .10)	2.0	.93	.94	.96	.06 (.04 - .08)
	Weak	2.9	.91	.91	.93	.08 (.07 - .10)	1.9	.92	.94	.96	.06 (.04 - .07)
	Strong	3.1	.91	.90	.93	.09 (.07 - .10)	1.8	.92	.93	.96	.06 (.04 - .08)
	<i>Strict</i>	3.0	.90	.90	.93	.08 (.07 - .10)	1.7	.91	.93	.96	.06 (.04 - .07)
Goal Value	Configural	2.5	.88	.87	.94	.07 (.05 - .09)	1.4	.97	.98	.99	.04 (.00 - .06)
	Weak	2.1	.88	.91	.93	.06 (.04 - .08)	1.2	.96	.99	.99	.03 (.00 - .05)
	Strong	2.6	.89	.90	.93	.07 (.05 - .08)	1.6	.96	.99	.99	.03 (.00 - .05)
	<i>Strict</i>	2.2	.89	.92	.94	.06 (.04 - .07)	1.4	.96	.99	.99	.03 (.00 - .05)
Planning/ Monitoring	Configural	1.9	.83	.88	.91	.06 (.04 - .07)	1.9	.86	.90	.93	.06 (.05 - .07)
	Weak	1.8	.82	.89	.91	.05 (.04 - .06)	1.8	.86	.91	.93	.05 (.04 - .07)
	<i>Strong</i>	1.9	.82	.88	.91	.05 (.04 - .06)	1.8	.86	.90	.93	.06 (.04 - .07)
	Strict	2.2	.80	.84	.89	.06 (.05 - .07)	2.3	.82	.85	.88	.07 (.06 - .08)
Social Comparison	Configural	1.1	.97	.99	.99	.02 (.00 - .05)	2.3	.95	.95	.97	.07 (.05 - .08)
	Weak	1.1	.97	.99	.99	.02 (.00 - .05)	2.1	.94	.95	.97	.06 (.05 - .08)
	<i>Strong</i>	1.7	.97	.99	.99	.03 (.00 - .05)	2.1	.94	.95	.97	.06 (.05 - .08)
	Strict	2.0	.95	.97	.98	.05 (.03 - .06)	1.7	.90	.93	.95	.05 (.04 - .07)
Self-Reward	Configural	1.5	.97	.98	.99	.04 (.02 - .06)	1.8	.96	.97	.98	.05 (.03 - .07)
	Weak	1.5	.96	.98	.99	.04 (.02 - .06)	1.7	.96	.97	.98	.05 (.03 - .07)
	<i>Strong</i>	1.8	.96	.98	.99	.04 (.02 - .06)	1.5	.96	.97	.98	.05 (.03 - .07)
	Strict	2.0	.94	.96	.97	.06 (.04 - .07)	1.7	.95	.96	.97	.06 (.04 - .07)
Self-Criticism	Configural	1.3	.97	.99	.99	.03 (.00 - .06)	2.2	.95	.95	.97	.07 (.05 - .08)
	Weak	1.2	.97	.99	.99	.03 (.00 - .05)	2.0	.95	.96	.97	.06 (.04 - .08)
	Strong	1.6	.96	.99	.99	.03 (.00 - .05)	2.2	.95	.96	.97	.06 (.04 - .08)
	<i>Strict</i>	1.6	.96	.98	.99	.03 (.01 - .05)	2.0	.95	.96	.97	.06 (.04 - .07)

Table 5.5. Confirmatory factor analyses: Robust fit indices for all questionnaires at each measurement time

Academic Domain					Sport Domain				
	χ^2/df	NNFI	CFI	RMSEA (90% CI)		χ^2/df	NNFI	CFI	RMSEA (90% CI)
AGQ					AGQ-S				
Time 1	1.9	.92	.95	.06 (.04 - .08)	Time 1	1.6	.97	.98	.05 (.03 - .07)
Time 2	1.9	.95	.96	.06 (.04 - .08)	Time 2	1.9	.95	.97	.06 (.04 - .08)
Time 3	2.2	.92	.94	.07 (.05 - .09)	Time 3	1.6	.97	.98	.05 (.03 - .07)
GSAB					GSAB				
Time 1	1.5	.92	.93	.04 (.03 - .05)	Time 1	1.3	.96	.97	.03 (.02 - .04)
Time 2	1.4	.95	.96	.04 (.03 - .05)	Time 2	1.4	.96	.96	.04 (.03 - .05)
Time 3	1.3	.96	.96	.04 (.03 - .05)	Time 3	1.4	.95	.95	.04 (.03 - .05)

Table 5.6. Unconditional linear and non-linear growth curve models: Fit indices and growth parameters in the academic domain

	χ^2	df	p	CAIC	CFI	RMSEA	Fixed Effects		Random Effects		Cov	Change
	Y-B						Mean		Variances		I – S	T1 – T2 of T1 – T3
							Intercept	Slope	Intercept	Slope		
PAP liner	1.24	3	.74	-18.56	1.00	.00	12.81	.01	12.99*	.92*	-1.09	
<i>PAP non-linear</i>	<i>0.23</i>	<i>2</i>	<i>.89</i>	<i>-13.14</i>	<i>1.00</i>	<i>.00</i>	<i>12.81</i>	<i>.02</i>	<i>12.78*</i>	<i>3.89*</i>	<i>-2.01</i>	-
PAV linear	4.87	3	.18	-14.87	1.00	.00	14.30	-.35*	7.91*	.26	.58	
<i>PAV non-linear</i>	<i>1.20</i>	<i>2</i>	<i>.55</i>	<i>-12.27</i>	<i>1.00</i>	<i>.00</i>	<i>14.45</i>	<i>-.76*</i>	<i>8.11</i>	<i>1.11*</i>	<i>.59</i>	99%
MAP linear	9.69	3	.02	-7.35	.98	.09	17.80	-.55*	4.24*	.92*	-.67	
<i>MAP non-linear</i>	<i>12.32</i>	<i>2</i>	<i>.00</i>	<i>-1.18</i>	<i>.99</i>	<i>.08</i>	<i>17.78</i>	<i>-1.12*</i>	<i>4.16*</i>	<i>1.17*</i>	<i>1.23</i>	58%
MAV linear	10.77	3	.01	-9.06	.96	.09	14.00	-.10	6.93*	.66	-.13	
<i>MAV non-linear</i>	<i>1.38</i>	<i>2</i>	<i>.50</i>	<i>-2.71</i>	<i>1.00</i>	<i>.00</i>	<i>14.00</i>	<i>-.15</i>	<i>7.24*</i>	<i>3.70</i>	<i>-1.04</i>	-
COM linear	0.22	3	.97	-19.84	1.00	.00	25.55	-.69*	4.40*	1.37*	-.44	
<i>COM non-linear</i>	<i>0.09</i>	<i>2</i>	<i>.96</i>	<i>-13.29</i>	<i>1.00</i>	<i>.00</i>	<i>25.57</i>	<i>-1.39*</i>	<i>4.43*</i>	<i>5.52*</i>	<i>-.97</i>	54%
PLM linear	8.12	3	.04	8.12	.90	.08	14.28	-.21*	3.60*	.70	-.49	
<i>PLM non-linear</i>	<i>4.66</i>	<i>2</i>	<i>.10</i>	<i>8.72</i>	<i>.96</i>	<i>.07</i>	<i>14.23</i>	<i>-.25</i>	<i>4.31*</i>	<i>4.22*</i>	<i>-1.99</i>	-
<i>SC linear</i>	<i>4.89</i>	<i>3</i>	<i>.18</i>	<i>-15.18</i>	<i>.98</i>	<i>.05</i>	<i>6.18</i>	<i>.44*</i>	<i>5.89*</i>	<i>.51</i>	<i>-.52</i>	50%
SC non-linear	7.48	2	.02	-5.89	.82	.10	6.30	.88*	5.27*	.00	-.77	
SMO linear	1.22	3	.75	-18.84	1.00	.00	14.96	.43*	13.37*	1.18	-1.02	
<i>SMO non-linear</i>	<i>1.93</i>	<i>3</i>	<i>.58</i>	<i>-18.10</i>	<i>.99</i>	<i>.00</i>	<i>15.04</i>	<i>.21*</i>	<i>12.58</i>	<i>.14</i>	<i>-.20</i>	20%

* $p < .05$ PAP – performance approach; PAV – performance avoidance; MAP – mastery approach; MAV – mastery avoidance; COM – goal commitment; PLM – planning/self-monitoring; SC – social comparison; SMO – self-motivation; Cov – covariance; I – intercept; S – slope

Table 5.7. Unconditional linear and non-linear growth curve models: Fit indices and growth parameters in the sport domain

	χ^2	df	p	CAIC	CFI	RMSEA	Fixed effects		Random Effects		Cov	% Change
	χ^2						Mean		Variances		I – S	T1 – T2 of
							Intercept	Slope	Intercept	Slope		T1 – T3
PAP linear	6.76	3	.08	-13.26	.97	.07	13.49	-.38*	11.24*	1.80*	-.82	
<i>PAP non-linear</i>	2.27	2	.33	-11.08	1.00	.02	13.50	-.69*	11.74*	8.12*	-2.50	72%
PAV linear	8.63	3	.04	-10.53	.96	.08	12.02	-.31*	14.46*	2.41*	-2.04	
<i>PAV non-linear</i>	0.46	2	.79	-12.90	1.00	.00	12.07	-.61*	15.36*	10.37*	-5.07*	76%
MAP linear	0.68	3	.88	-18.95	1.00	.00	18.45	-.44*	3.76*	.85*	-.48	
<i>MAP non-linear</i>	0.63	2	.73	-12.30	1.00	.00	18.44	-.88*	3.74*	3.38*	-.92	48%
MAV linear	1.88	3	.60	-17.63	.99	.00	15.65	-.46*	7.87*	1.54*	-1.37	
<i>MAV non-linear</i>	1.42	2	.49	-11.97	.99	.00	15.67	-.90*	8.05*	6.33*	-2.96	61%
COM linear	1.40	3	.71	-18.59	1.00	.00	24.81	-.57*	5.31*	1.24	-.26	
<i>COM non-linear</i>	0.58	2	.75	-12.75	1.00	.00	24.75	-1.13*	5.16*	4.71	-.08	34%
PLM linear	6.85	3	.08	-13.14	.97	.07	13.71	-.16	6.60*	.66	-.93	
<i>PLM non-linear</i>	0.06	2	.97	-13.27	1.00	.00	13.80	-.37	9.03*	5.28*	-4.07*	-
<i>SC linear</i>	2.38	3	.50	-17.20	1.00	.00	6.66	-.24	10.75*	2.81*	-3.34*	-
SC non-linear	2.56	2	.28	-11.18	.99	.03	6.64	-.45	10.61*	11.39*	-6.66*	
SCQ linear	2.07	3	.56	-17.92	1.00	.00	15.70	-.39*	16.96*	1.83	-2.50	
<i>SCQ non-linear</i>	2.30	3	.47	-17.69	1.00	.00	15.88	-.85*	16.07*	3.96	-3.13	100%

* $p < .05$ PAP – performance approach; PAV – performance avoidance; MAP – mastery approach; MAV – mastery avoidance; COM – goal commitment; PL/SM – planning/self-monitoring; SC – social comparison; SMO – self-motivation; Cov – covariance; I – intercept; S – slope

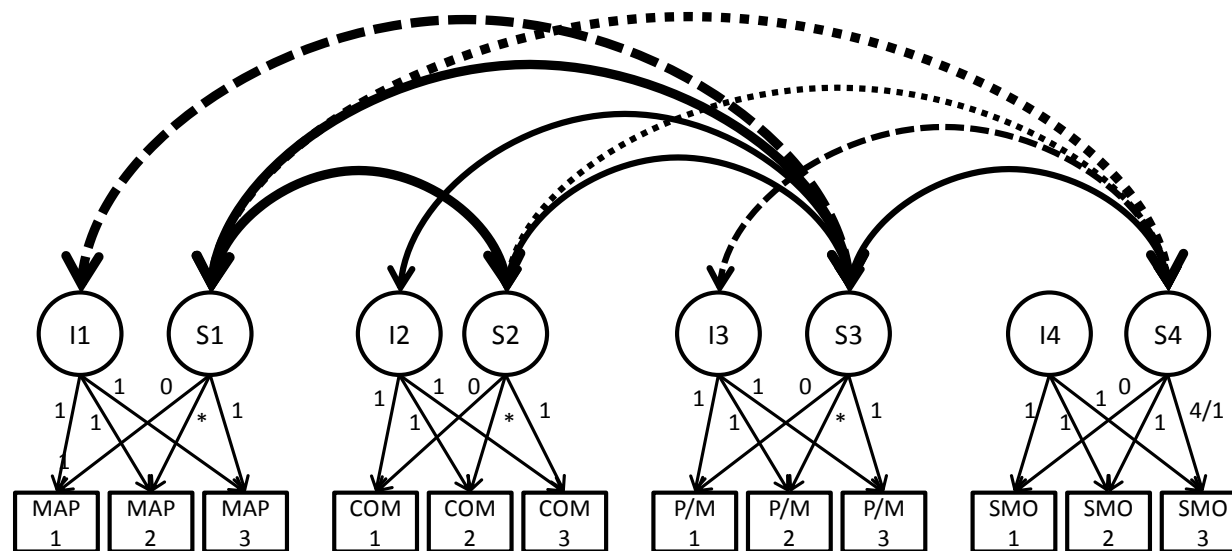


Figure 5.2. Associative growth curve models in both domains: Covariates of mastery-approach goals (MAP) (goal commitment – COM; planning/monitoring – P/M; self-motivation – SMO; Intercept – I; Slope – S; continuous line – both domains; dashed line – education only; dotted line – sport only)

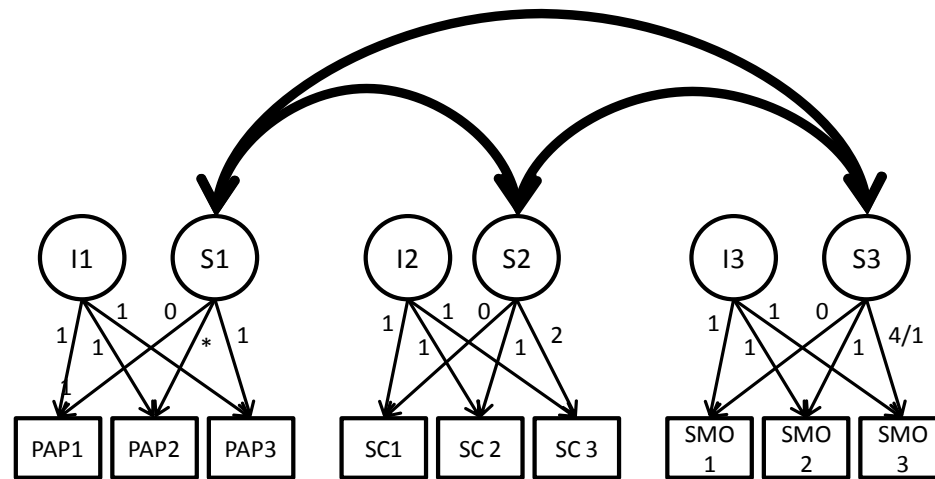


Figure 5.3. Associative growth curve models in both domains: Covariates of performance-approach goals (PAP) (social comparison – SC; self-motivation – SMO; Intercept – I; Slope – S)

Table 5.8. Robust fit indices at each measurement time and across times in two settings

Academic Domain					Sport Domain				
	$S-B \chi^2/df$	NNFI	CFI	RMSEA (90% CI)		$S-B \chi^2/df$	NNFI	CFI	RMSEA (90% CI)
Time 1	1.5	.90	.90	.04 (.04 - .05)	Time 1	1.4	.94	.94	.04 (.03 - .04)
Time 2	1.4	.93	.93	.04 (.04 - .05)	Time 2	1.4	.94	.95	.04 (.03 - .04)
Time 3	1.4	.93	.94	.04 (.03 - .04)	Time 3	1.3	.95	.96	.04 (.03 - .04)
T1/T2/T3	1.4	.94	.94	.04 (.03 - .04)	T1/T2/T3	1.3	.95	.95	.04 (.03 - .04)

Table 5.9. Standardized path coefficients for each time point and across time points in two domains

	Academic Domain Coefficients				Sport Domain Coefficient			
	Time1	Time2	Time3	<i>T1/T2/T3</i>	Time1	Time2	Time3	<i>T1/T2/T3</i>
To Goal Efficacy								
Mastery-Approach	.12	.20	.34	.23	.24	.23	.29	.27
Mastery-Avoidance	-.10	-.13	-.23	-.16	-.06	-.10	-.07	-.08
Performance-Approach	.05	.06	.11	.07	-	-	-	-
To Goal Value								
Mastery-Approach	.25	.33	.26	.29	.44	.38	.29	.37
Goal Efficacy	.23	.24	.15	.19	.25	.28	.43	.32
To Planning/Monitoring								
Mastery-Approach	.17	.12	.21	.17	-	-	-	-
Goal Value	.31	.23	.11	.21	.62	.52	.62	.58
To Social Comparison								
Performance-Approach	.26	.28	.30	.28	.27	.21	.28	.25
To Self-Reward from								
Planning/Monitoring	.42	.66	.92	.71	.71	.73	.66	.71
Social Comparison	.28	.31	.28	.30	.30	.36	.29	.31
To Self-Criticism from								
Planning/Monitoring	.18	.27	.26	.25	.28	.41	.34	.34
Social Comparison	.29	.49	.30	.35	.33	.62	.29	.41
Mastery-Avoidance	.28	.20	.38	.28	.27	.24	.34	.28

All path coefficients are significant at $p < .05$

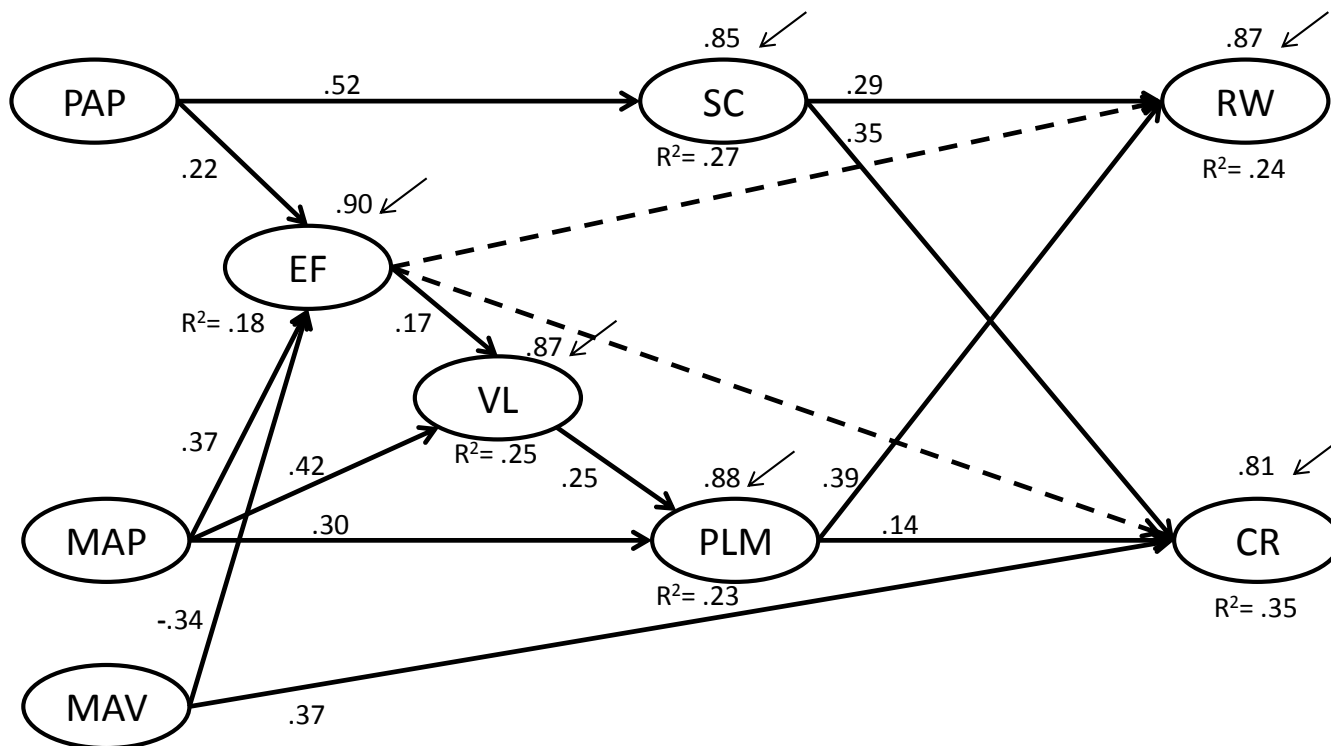


Figure 5.4. The academic domain model showing beta values, R^2 and disturbance terms (dashed line - non significant paths; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism

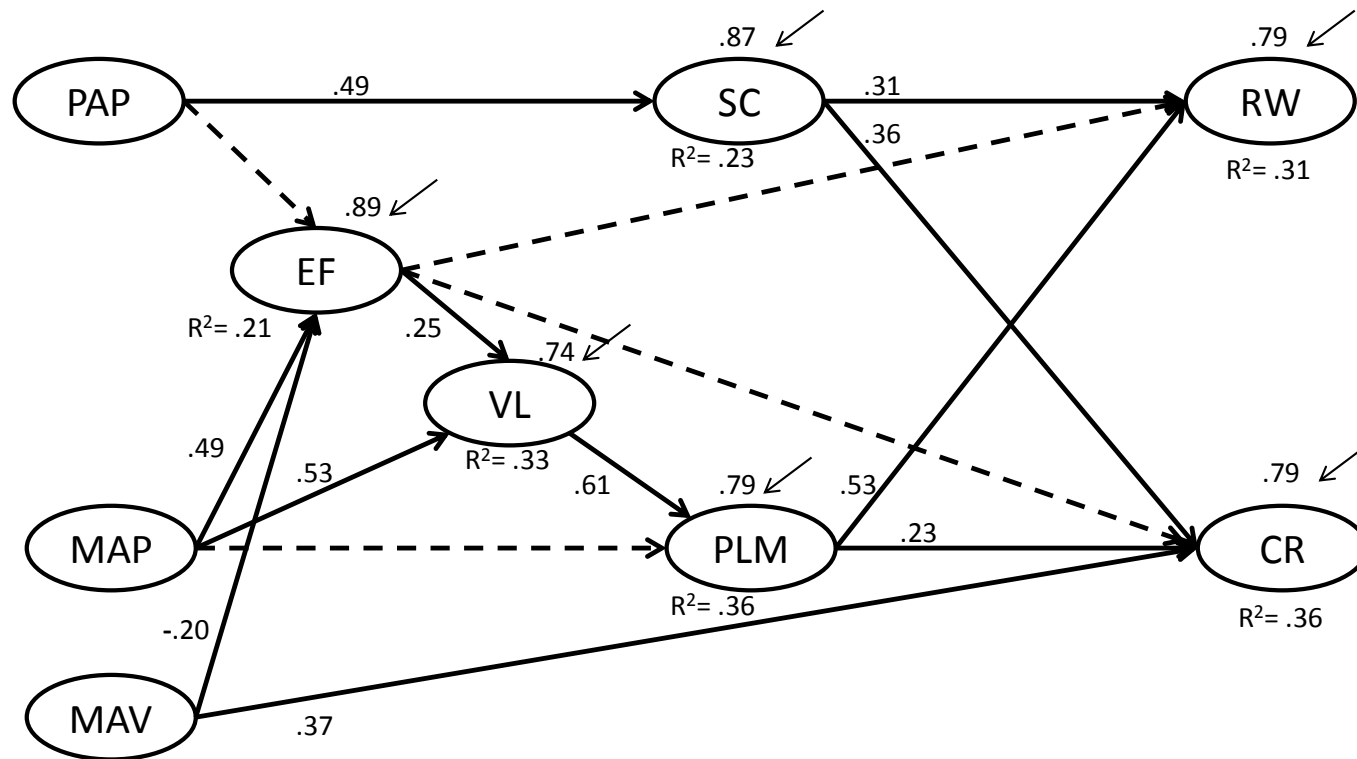


Figure 5.5. The sport domain model showing beta values, R^2 and disturbance terms (dashed line - non significant paths; PAV - Performance Avoidance, PAP - performance Approach, MAP - Mastery Approach, MAV - Mastery Avoidance, EF - Efficacy, VL - Value, PLM - Planning / Self-Monitoring, SC - Social Comparison, RW - Self-Reward, CR - Self-Criticism

5.4. Discussion

Achievement Goal Changes

Achievement motivation and SR are not static. However the research design and analytic methods in the literature have not captured the changing nature of achievement goals and their implications for SR activity, particularly over one academic year. With a longitudinal design, growth-curve analytic techniques, and structural equations modelling that incorporated both measurements of achievement goals and SR processes across time, the present study expanded current understanding of the nature and implications of achievement goals. Specifically, this study provided important insights into temporal changes in achievement goals, and SR processes, the associations between achievement goals and SR growth parameters, and the temporal invariance of paths linking goals and SR.

Consistent with prior research in higher education and the hypotheses of this study, the current data indicated that the four goals followed a different pattern of change: Map declined (Fryer & Elliot, 2007; Jagacinski et al., 2010; Senko & Harackiewicz, 2005b; Shim et al., 2012); Pap and Mav were stable (Fryer & Elliot, 2007; Jagacinski et al., 2010; Muis & Edwards, 2009; Shim et al., 2012); Pav however, declined which is contrary to previous reports (Fryer & Elliot, 2007; Jagacinski et al., 2010; Muis & Edwards, 2009; Shim et al., 2012). Additionally, students differed in their initial level and the rate of change of three goals, but registered similar changes in Mav. Map decline was relatively steady over two semesters, whereas Pav declined only in semester 1. In previous studies Pav stability or increase may be explained by the presence of one or more assessments during the first semester at university, whereas in this study, the decline may be due to the lack of evaluations during semester 1 (T1 – T2).

Additionally, in line with previous findings in physical education settings and the hypotheses of this study, the sport data indicated that all four goals declined (Barkoukis et al., 2010; Warburton & Spray, 2008, 2009). The decline in the two mastery goals was relatively steady over the year, whereas most of the decline in performance goals occurred in semester 1. Most student-athletes seem to become less concerned with proving their sport ability (or failing to

prove it) as time goes by and they consolidate their place in university teams during semester 1. Similarly, their initial contact with the academic context in semester 1, while alleviating their concerns with normative incompetence does not change their desire to do well in relation to their peers in the forthcoming mid-year assessments.

Finally, the average trends of within-individual changes obscure between-individual differences in growth parameters. In both domains, student-athletes started the academic year with different levels of goal endorsement and followed different growth trajectories over the year; there was only one exception from this pattern, academic Mav change was similar across students. Therefore, not all students' Map and Pav declined, and Pap was stable, but all students' Mav levels remained stable over a year. On the other hand, achievement goals did not decline for all athletes during the season.

Self-Regulation Changes

In both academic and sport contexts, goal commitment (i.e. efficacy and value) declined, while engagement in planning and self-monitoring remained unchanged during the year. This is consistent with previous findings of decreasing competence and value in both settings (Choinard & Roy, 2008; Rodriguez et al., 2003; Smith et al., 2002; Xiang et al., 2004). On the other hand, social comparison and self-motivation followed different patterns of change in the two settings: in education both increased, whereas in sport, involvement in social comparison remained stable, and self-motivation declined first then was stable. However, these average group trends were not followed by all student-athletes. Specifically, not all students' goal commitment declined and planning/monitoring activity remained stable, but all students' engagement in social comparison and self-motivation increased over the year. Additionally, not all athletes' planning/monitoring activity and involvement in social comparison remained stable, but all athletes' goal commitment and involvement in self-motivation declined over time.

Associations between Achievement Goal and Self-Regulation

The results of associative LGC models 1 and 2 including Map and three SR processes showed that: a) in both settings, Map changes were positively associated with changes in goal commitment, planning and self-monitoring; moreover, changes in the latter were positively linked to changes in goal commitment and self-motivation, but negatively associated with the initial levels of goal commitment (i.e. decreases in planning and self-monitoring were slower for students with higher goal commitment at the start of the year); b) in sport, changes in Map and goal commitment were positively associated with changes in self-motivation; c) in education, students' initial levels of Map endorsement and planning/monitoring activity were negatively associated with the rate of change in the use of planning/monitoring and self-motivation respectively. In other words, for students with higher initial levels in the former variables the decline in the latter would be less severe than for those with lower baselines. Furthermore, the results of the associative LGC models 2 and 3 including Pap and two SR processes, demonstrated identical relations between slopes in both settings; specifically, there were positive associations between changes in Pap, social comparison and self-motivation. Lastly, in sport settings, Mav intercept and slope were not related to changes in SR variables (model 5).

Finally, SEM analyses demonstrated that the relations between goals and the original six SR processes are the same at each time point, therefore supporting the temporal invariance of model paths identified in studies 1 and 2. This study extends the small body of research demonstrating the temporal invariance of goal effects (O'Keefe et al., 2013; Paulick et al., 2013; Shim et al., 2012) and the implications of goal changes to changes in other variables (e.g. self-esteem, contingencies of self-worth, normative perceived competence, self-efficacy, use of active learning strategies, external regulation, academic performance) (Conroy et al., 2006; Jagacinski et al., 2010; Meece & Miller, 2001; O'Keefe et al., 2013; Shim et al., 2008; 2012) in two ways: by documenting changes over a longer period of time (i.e. one year rather than one semester), and by focusing on new goal outcomes (i.e. SR strategies) in academic and sport settings.

Theoretical and Practical Implications

Achievement Goals. The pattern of goal change found in the academic domain is consistent with the predictions of the hierarchical model of achievement motivation: goals with uniform positive or negative antecedents (Map and Pav) produce a consistent pattern of consequences (Elliot, 1997) and are more likely to fluctuate; goals with mixed antecedents (Pap and Mav) produce a mixed pattern of consequences (Moller & Elliot, 2006) a likely bidirectional, mutually cancelling change at personal level and stability at the group level of analysis (Fryer & Elliot, 2008). Furthermore, a group level decline in students' interest in personal improvement and task mastery, together with a steady interest in demonstrating normative competence could be encouraged by the characteristics of the first year university environment: a compulsory diet of classes taught in large lecture format (which do not allow for material adaptations to students' interests or learning styles), and a consistent emphasis on grades. Although not applying to all students, this group trend of continuous Map decline and steady Pap levels is rather worrying from a practical perspective, as a plethora of research advocate high levels of Map to counteract some negative effects of Pap. Tutors should promote a view of grades as indicators of personal mastery of course material and professional development, and should attempt to cater to students' diverse interests and learning styles by providing small group seminars and a choice of assignment topics and formats.

Furthermore, it is worth noting the rather solid stability of Mav goals, both over time and across students; this persistent fear of learning stagnation and loss of knowledge is not surprising since the amount of knowledge that needs to be processed during an academic year increases, and good grades are dependent on retention and understanding of material. First year tutors should provide regular opportunities for revision and preparation for assignments and exams in order to support students' understanding and retaining of course material. Finally, Mav's contrasting pattern of stability to that of change in the other three goals advocates its inclusion in future research, and a departure from the rather common practice of dropping it from investigations.

In contrast to the academic domain, in sport settings group level achievement motivation of all types declined over the competitive season. These findings support the 'pure antecedents' hypothesis of the hierarchical model (i.e. both Map and Pav declined), but not the 'mixed

antecedents' argument (i.e. Pap and Mav were not stable). Nevertheless, the current pattern of decline in all goals could be explained by the interaction of competence valuation (a positive antecedent of all goals) with the environment (i.e. the conflicting demands of the academic and sport domains): sport competence may become less important in the context of increasing academic demands. Doing well academically and getting a good degree is generally the main priority for university students, while sport participation has a more secondary role. Coaches should prevent the decline in motivation by providing interesting and enjoyable training sessions with a focus on fitness, skill improvement and cohesive team work, and should promote a view of competition as a means to personal improvement.

Self-Regulation. In line with SR conceptualization and theoretical predictions (Pintrich, 2000a; Winne & Perry, 2000), SR processes vary across time and students. Contextual influences on SR are particularly evident when students follow similar trends of SR change. In this study, all students' use of social comparison and self-motivation increased over the year, highlighting perhaps an increasing extrinsic emphasis on grades. Indeed, students' contact with a high standards university environment could prompt increasing engagement in peer comparison, a reevaluation of personal competence, and more effort put into maintaining or improving one's motivation (i.e. through self-reward and self-criticism). Moreover, the greater academic demands or pressures and the parallel diminished importance of sport competence could explain the common pattern of decline in athletes' goal commitment (efficacy and value) and self-motivation.

Achievement Goals and Self-Regulation. Consistent with the predictions of achievement goal theory and SR models, study 4 showed that achievement goals and SR processes are related both at 'static' (cross-sectional) and 'dynamic' (longitudinal) levels. Moreover, in both domains, the relationships between longitudinal intra-individual changes in achievement goals and SR processes, and the relations between their levels at each time point are very similar to the associations found in the cross-sectional literature in general, and in studies 1 and 2 in particular: the levels and changes in Map were associated with the levels and changes in goal commitment, planning, self-monitoring and self-motivation, while the levels and changes in Pap were associated with the levels and changes in social comparison and self-motivation.

The current study demonstrated that approach goal changes have implications for SR use over time; specifically it showed the potential cost of a Map goals decline for the use of SR. Starting university with high Map boosts students' personal goal commitment and their active engagement in SR. However, a decreased interest in self-referenced standards of competence could lead to lower levels of goal efficacy, goal value, planning, self-monitoring and self-motivation. Additionally, a decline in student-athletes concern with normative competence (prompted by poor grades) may lead to less engagement in self-motivation and monitoring/evaluation through peer comparison. The current findings converge with previous cross-sectional research documenting the importance of Map and Pap for adaptive SR activity. From a practical perspective, educators and coaches should support student-athletes' efforts to self-regulate through mastery goals setting, planning, monitoring/evaluation and control techniques, and should encourage them to seek support from tutors and peers.

Limitations

Although this longitudinal study provides new insights regarding achievement goals and SR, there are key limitations that need to be considered. First, the correlational nature of the data does not allow causal interpretations. The working assumption that achievement goals influence the use of SR strategies was based on the conceptualisation of goals as broad cognitive frameworks (Elliot, 2005); however, SR models allow for bidirectional links between the components of the pre-performance phase (e.g. goals) and the performance or post-performance phases of SR (i.e. strategy use, reflections and reactions) (Pintrich, 2000a). Second, the current findings may not generalize to other contexts such as: pre-university levels of education, due to the varying influence of goals across education levels (Pajares & Cheong, 2003); second and third year university environments, as year one represents a period of transition and adaptation, with few assessments and relatively little pressure to perform; more competitive university settings where curve grading is used, in comparison to the moderately competitive British university context where criterion-based evaluations are employed; higher levels of sport (elite and sub-elite), more competitive university sport environments and less competitive exercise settings. Third, a longer time frame and four or more measures would provide additional understanding of achievement goals and SR. The

present study investigated changes within one academic year and competitive season; some studies with school students revealed greater changes taking place between years rather than within years (Anderman & Anderman, 1999; Anderman & Midgley, 1997) while others reported the opposite pattern (Muis & Edwards, 2010). Fourth, this study employed domain-general measures of achievement goals rather than evaluations specific to academic subjects and sport settings (i.e. practice or competition). The theoretical conceptualization of goals as a function of individual differences and contextual characteristics supports both approaches, and there is evidence that goals operate in a similar way in different academic subjects (Bong, 2001; Wolters, Yu & Pintrich, 1996). Moreover, the implications of Mav changes in academia and the effects of Pav changes in both settings were not tested in this study due to the temporal stability of Mav and the null links between Pav and SR in studies 1 and 2. Fifth, although performance feedback and grades can influence goal changes (Jagacinski et al., 2010; Senko & Harackiewicz, 2005b; Williams, Donovan & Dodge, 2000) in this study the distribution of assessment periods around the three points of data collection was not even – students received feedback and grades only after T2. Finally, the present sample represented only one cultural group (British white students-athletes) and therefore it is not known whether the results would generalize to other ethnic groups, European countries and collectivistic cultures. Similarly, the existing literature on goals changes is largely based on white North American students.

Future research should capture the temporal dynamics of achievement goals, SR and their associations: at different levels of university education; both between and within years of study, pre- or post- assessment feedback; in highly competitive and non-competitive physical activity contexts (e.g. elite sport and exercise settings); in pre-university education and sport contexts; in more specific academic and sport settings; and in various cultural and ethnic groups.

Conclusion

In conclusion, achievement motivation and SR are not static, and variability in achievement goals is responsible for changes in SR activity, in education and sport contexts. By taking advantage of current advances in growth-curve analytic techniques this study provided for the

first time a more complete understanding of related changes in achievement goals and SR in both domains. The overall patterns of change in the two settings are more similar than different. The decline noted in motivation and SR may have detrimental effects on academic performance and sport participation. Tutors and coaches should make systematic efforts to develop and maintain mastery motivational climates in order to prevent or reduce the downward trends in motivation and SR noted in first year student-athletes.

CHAPTER 6. General Discussion

This thesis addressed calls from the literature to integrate three generally independent lines of research – achievement goals (the why), personal goals (the what) and self-regulation processes (the how) (e.g. Fryer & Elliot, 2008; Kaplan & Maehr, 2002), and made an attempt to fill in some gaps in these bodies of work. Using structural equation modelling and latent growth curve analyses, the work within identified the patterns of self-regulation (SR) strategies (planning/self-monitoring, social comparison, self-reward and self-criticism) engendered by approach and avoidance goals, and the role played by personal goal attributes (efficacy, value, difficulty/specificity), domain, culture and time in these goal-strategy patterns. A comprehensive model including these variables has not been tested before in academic and physical activity settings. This thesis investigated five broad questions and related hypotheses:

- *What are the SR strategies engendered by the four achievement goals?* Distinct goal-strategy patterns were expected for each goal, with approach goals predicting engagement in a number of SR strategies (i.e. planning, self-monitoring, social comparison, self-reward and self-criticism), and avoidance goals predicting little or no engagement in these strategies (studies 1 to 4).
- *What is the role of personal goal attributes in these goal-strategy patterns?* According to the reason-standard complex, personal goals (standards) attributes were predicted to influence SR patterns of activity: specifically, goal efficacy and value were expected to be positive and negative/null mediators of approach and avoidance goals respectively (studies 1 to 4); and goal difficulty/specificity was expected to be a moderator of all achievement goal effects in education (study 1).
- *What are the roles played by context and time in these relations?* The five contexts selected could be distinguished in terms of life domains (academic, sport and exercise), culture (individualistic and collectivistic) or a common dimension labelled objective competitive level (i.e. non-competitive exercise setting, low-to-moderate competitive

academic and sport domains, and highly competitive elite sport context) (studies 1 to 3). It was predicted that the goal-strategy patterns will remain largely stable across domains and cultures (Pap less than Map pattern), and that the objective competitive level inherent in the context would be a more meaningful moderator than domain or culture per se. Moreover, it was expected that the patterns of goal relations would be invariant over one year (three time waves) and that longitudinal changes in achievement goals would be related to changes in SR strategies (study 4).

- *What are the cultural and temporal dynamics of achievement goals and SR strategies?*

Differences in achievement goals and SR were expected between elite and sub-elite athletes from individualistic and collectivistic cultures (i.e. the UK and Romania) (study 3a); students and athletes' Pap and Mav goals were expected to change, while Map and Pav were expected to remain stable over one year (study 4).

- *What is the nature of authentic personal goals set by students, athletes and exercisers?*

What is the prevalence of avoidance and comparative-performance goal types in these samples? Do quantitative investigations of achievement goals overestimate the phenomenological reality of these types of goals? (studies 1, 2 and 3b)

The results generally supported these hypotheses and revealed that: achievement goals had distinct relationship patterns with SR – approach goals promoted all of SR strategies investigated, and avoidance goals had little or no impact on these proactive SR processes; personal goal characteristics played an important mediating or moderating role in these relations; goal-strategy patterns were stable over time and generalised to a large extent across domains and cultures, with small differences being explained by contextual competitive level; temporal changes in achievement goals were related to changes in goal commitment and SR strategy use; there were cultural and temporal differences in achievement goals, goal commitment and SR strategies; and finally, the natural occurrence of goal contents depends on how they were conceptualised and the definitions and probability of success afforded by the environment. Next are discussed: approach and avoidance goal effects on SR; the role of

personal goal attributes (efficacy and value, difficulty and specificity, and goal focus); cultural differences and temporal stability; methodological limitations and thesis contributions.

6.1. Approach Goals and Self-Regulation

Approach goals focus on success, and this positive hub of SR activity evokes and sustains hope, eagerness and excitement (Peckrun, Elliot & Maier, 2006; 2009), and, as shown in this work, promote the systematic regulation of goal progress through different metacognitive and motivational strategies (i.e. two distinct goal-strategy patterns).

6.1.1. Metacognitive Regulation through Planning and Self-Monitoring

Approach goals' relations with planning and self-monitoring were mediated by personal goal efficacy and value; Map effects were stable across contexts (domain and cultures), while Pap effects were moderated by the objective contextual relevance and probability of normative success rather than domain or culture per se. Across domains and cultures, Map had positive moderate relations (direct and indirect) with planning and self-monitoring, and perceptions of personal goal efficacy and/or goal value were key mechanisms in these relations (i.e. full or partial mediators). When individuals seek to improve their competence they plan their course of action and then monitor and evaluate progress towards personal goals, because they believe these self-set standards of competence are achievable and important.

On the other hand, Pap relations with planning and self-monitoring varied in different contexts from null to positive/low and indirect, through goal efficacy and value. When individuals seek to prove their competence by outperforming others they consider planning and self-monitoring strategies of little or no relevance to this purpose depending on the perceived attainability and importance of their personal goals, and the objective probability of normative success inherent in the context. Some engagement in planning and monitoring in relation to personal goals may be deemed useful in moderate competitive contexts where many can achieve normative success (i.e. university education and sport settings) as in these contexts there is some hope that self-set standards of competence (in the service of Pap) are achievable. Alternatively, in

non-competitive and highly competitive domains (i.e. exercise and elite sport settings) Pap does not seem to have any influence on individuals' confidence to attain personal goals and, therefore, on their planning and self-monitoring efforts.

Previous research on the relation between motivation and SR is usually limited to the direct independent effects of motivational beliefs (i.e. achievement goals, efficacy, value) on omnibus measures of metacognition (including planning, self-monitoring/evaluation and self-control strategies) in school and university students from Western countries (e.g. US, Canada, Norway, Greece, Israel). Consistent with the thesis' results, in previous studies Map had positive direct relations with metacognition in academic (Bartels & Magun-Jackson, 2009; Braten, Samuelstuen & Stromso, 2004; Howell & Watson, 2007; Kaplan et al., 2009; Vermetten, Lodewijks & Vermunt, 2001) and physical education classes (Ommundsen, 2006; Papaioannou, Simou, Kosmidou, Milosis, & Tsigilis, 2009; Theodosiou & Papaioannou, 2006); Pap effects varied from positive and weak (Bartels & Magun-Jackson, 2009; Howell & Watson, 2007; Kaplan, Lichtinger, & Gorodeski, 2009; Ommundsen, 2006) to null (Braten et al., 2004; Papaioannou et al., 2009; Theodosiou & Papaioannou, 2006; Vermetten et al., 2001). The only two studies found in the literature which tested a complex model of goals, self-efficacy and SR strategies through structural equations modelling reported similar results to the current data – students' self-efficacy was a full and partial mediator of Pap and Map effects respectively, on metacognition and disorganisation (Bandalos, Finney, & Geske, 2003; Coutinho & Neuman, 2008).

The original achievement goal theory (e.g. Nicholls, 1989) predicts significant positive interactions between Pap and perceived self-efficacy, and null interactions between Map and self-efficacy (i.e. adaptive outcomes for Pap only when efficacy is high and for Map regardless of efficacy perceptions). Minimal research has been conducted on the interaction between Pap and perceived competence/self-efficacy (Elliot, 2005) and the support was inconsistent (Bouffard et al., 2005; Coutinho & Neuman, 2008; Cury, Elliot, Da Fonseca & Moller, 2006). The current findings on approach goals and self-referenced metacognitive activity (i.e. planning and self-monitoring) provided qualified support for these tenets, indicating that their veracity may depend on the outcome investigated and other intervening

variables such as value and contextual characteristics: Pap effects are mediated by goal efficacy *and* value in moderately competitive contexts, while Map effects are (fully or partially) mediated by goal efficacy and value across contexts regardless of competitive level. Future research should consider the interplay between competence/efficacy, value and contextual characteristics in the effects of achievement goals on SR and other outcomes.

From a practical perspective, the effectiveness of goal setting as a strategy for enhancing motivation and performance depends on goal commitment (i.e. perceptions that goals are attainable and meaningful), planning of relevant strategies, monitoring and evaluation of goal progress, and adjustment of goals and plans based on feedback (Locke & Latham, 2007; Burton & Weiss, 2008). This is particularly important in sport contexts as they are ‘characterised by complex, dynamic and rapidly changing situations. [and] How the athlete integrates, interprets and develops plans for action is essential to successful sport performance’ (Kitsantas & Kavussanu, 2011, p. 217). Several studies showed the benefits of self-monitoring and self-evaluation to learning and performance of motor skills (Krischenbaum, Ownes, & O’Connor, 1998; Polaha, Allen, & Studley, 2004). The current data showed that goal setting is more likely to fail for individuals with a motivational profile dominated by Pap without the balancing effects of Map (high Pap/low Map profile). When personal goals are subordinated to the broad purpose of outperforming others, the lack of control inherent in this purpose has a little influence on individuals’ perceptions of their goals as attainable and meaningful, and on the perceived relevance of planning and self-monitoring to goal pursuit. Therefore, high Pap individuals are less likely to engage in these strategies and/or to follow through plans set by others, with negative consequences for performance.

6.1.2. Metacognitive Regulation through Social Comparison

Pap and Map had different relations with social comparison, positive and null or negative respectively, and these links were moderated by the context. Map had null effects on social comparison in all contexts but one, the academic domain in Romania, where the relation was negative. Across domains and cultures when individuals’ broad purpose of engagement is self-improvement, social monitoring is considered either irrelevant or counterproductive for

this purpose. On the other hand, Pap had positive, moderate to strong, direct relations with social comparison in all contexts but one, elite sport in Romania (where Pav instead of Pap predicted social comparison). Therefore, when individuals desire to outperform others, they monitor and evaluate their progress in comparison with their peers who work on similar tasks or goals; however, this is the case only in moderately competitive and non-competitive contexts where many can succeed (i.e. academia, low level sport, exercise settings). In other words, during goal pursuit, knowing whether one is doing better or worse than peers on a task is regarded as useful information, as long as there is a good chance of being successful in a normative sense on task completion.

The literature on achievement goals and social comparison consists of a few experimental and field studies with Israeli and French high school and university students. Consistent with the current data, these studies reported that Pap individuals were interested in comparative feedback in both academic (Butler, 1992, 1993; Darnon et al. 2010; Regner, Escibe & Dupeyart, 2007) and sport tasks (when perceived competence was high) (Cury & Sarrazin, 1998). In contrast to the present findings, the academic studies reported a weak positive association between Map and social comparison. Moreover, in one study this link was independent of Pap level and the authors concluded that in the context of multiple goals pursuit ‘mastery goals actually serve performance goals [...] one’s pursuit of mastery goals could be a step towards the pursuit of performance goals (mastering more than others)’(Darnon et al., 2010, p. 220). On the other hand, based on experimental studies, Butler (1992, 1993) argued that individuals in Map and Pap conditions were interested in different kinds of social comparison, or for different reasons – for self-improvement (i.e. to learn from others) and for self-enhancement (i.e. to maintain a favourable self-image) respectively; later though she concluded that both goals were linked to social comparison for both reasons (Butler, 1995).

It is important to note that these studies have some methodological limitations. In the experimental studies by Butler, the task was novel and potentially meaningless (i.e. drawing pictures, problem solving), and all participants were exposed to social comparison information, post task involvement, therefore students in the Map group could only choose

between different types of social comparison, they could not ignore it. Moreover, the Social Comparison Orientation measure (Gibbons & Buunk, 1999) used in both field studies ‘capture only the level of interest in social comparison but not the use of actual comparisons’ (Regner et al., 2007, p. 580). In contrast in this thesis, social comparison was operationalised as a SR process, the intentional use of monitoring and evaluation of personal goal progress in comparison with peers.

The current data support theoretical predications of positive and negative or null links from social comparison to Pap and Map respectively. Social comparison has been a central feature of Pap conceptualisations either implicitly (e.g. Elliott & Dweck, 1988) or explicitly (e.g. Nicholls, 1984) therefore it was rarely tested empirically as an outcome variable. This thesis filled this gap, and revealed for the first time that across academic and physical activity domains, in both individualistic and collectivistic cultures social comparison is an important feature of Pap regulation as an intentional SR process of monitoring and evaluation of goal progress in relation to others.

Although the association between Map and social comparison found in this thesis was consistent with achievement goal theory, the positive links reported in the literature cannot be ignored as they open up important questions about the nature, purpose and implications of social comparison. For achievement goal theorists, social comparison implies gathering information on outcome or product measures of performance (rather than process) (e.g. one’s grades or sport performance relative to others), with negative effects on performance as less attention is available for task execution. In contrast, social comparison theorists view comparison with others as a general process of self-evaluation through others (Gibbons & Buunk, 1997, 2000), and an useful resource for gathering accurate information about the self, the task and how to improve (Butler, 1995; Collins, 1996; 2000; Lockwood & Kunda, 1997). It is rather surprising that so little has been done in the way of integrating social comparison and achievement motivation goal theories (Wheeler & Suls, 2005). According to this related literature the effects of social comparison depend on the level of comparison target (upward vs. downward), purpose of comparison (self-improvement vs. self-enhancement), whether

individuals see themselves as similar or dissimilar to the comparison target (assimilation vs. contrast), and the personal importance of the domain (Wheeler & Suls, 2005).

According to social comparison research, in optimally challenging situations individuals engage in slightly upward comparison intentionally for self-improvement reasons (i.e. learning from others), and this strategy has performance benefits (e.g. Buunk, Kuyper & Van der Zee, 2005; Gibbons, Blanton, Gerrard, Buunk, & Eggleston, 2000; Huguet, Dumas, Monteil, & Genestoux, 2001). Moreover, the tendency towards upward comparison increases with higher personal importance of academic subject (Huguet et al., 2000). On the other hand, under conditions of perceived threat or stress (e.g. threat of test failure), individuals prefer downward comparison (i.e. to worse-off targets) in order to alleviate negative affect and maintain a positive self-image (i.e. self-enhancement). Both upward and downward comparison can improve mood and self-evaluations, but only if people see themselves as similar to the upward target and dissimilar to the downward target (Buunk & Gibbons, 2007). Wheeler and Suls (2005) argued that ‘every social comparison creates both the pull for assimilation and the push for contrast. Which process predominates depends on the person’s degree of freedom and flexibility to make *strategic* comparisons’ (p. 576).

From a practical perspective, there has been a long standing debate about the value of Pap goal (and implicitly social comparison) in education (Elliot & Moller, 2003; Harackiewicz, Barron, Pintrich, Elliot & Thrash, 2002; Midgley, Kaplan, & Middleton, 2001) and sport literatures (e.g. Harwood, Spray & Keegan, 2008; Roberts, 2012; Vansteenkiste, Mouratidis & Lens, 2010). Some argued that Pap goals could be beneficial in some contexts such as competitive college and elite sport setting, and for some individuals such as older students and athletes, those with a high Map goal in their profile, high perceptions of competence and/or autonomous reasons for engagement (hence both Pap and Map goals should be emphasised by practitioners – the multiple goal approach); while other researchers argued that Pap goals would lead individuals to focus on strategies that aim at enhancing short-term performance rather than long-term learning and development (only Map goals should be encouraged – the mastery perspective). However, ‘the difference in opinions regarding performance goals may be due, in part, to the instruments used (Hulleman et al., 2010, p. 429): supporters of Pap goal

adoption (and social comparison) tended to utilise the Achievement Goal Questionnaire (AGQ; Elliot & McGregor, 2001) which focuses on the normative comparison component of the Pap construct; while the detractors of Pap goal adoption tended to use the Patterns of Adaptive Learning Strategies (PALS; Midgley, Maehr, Hruda, Anderman, Anderman, & Freeman, 2000) which focuses exclusively on the self-presentation component.

In an attempt to clarify the nature and role of Pap goal regulation (through social comparison), Elliot and Moller (2003) argued that Pap goals look ‘quite positive’ from an empirical viewpoint, ‘positive but problematic’ from a theoretical perspective, and ‘the least positive’ from an applied (meta-theoretical) standpoint. They concluded that Pap goal adoption (and social comparison) is ‘neither good nor bad’ but rather a ‘valuable yet vulnerable’ form of regulation. On the one hand, as a natural manifestation of a basic human need for competence, normative feedback is necessary for optimal human functioning (Elliot & Moller, 2003), because ‘other-based goal pursuit yields highly diagnostic, self-relevant competence information [...] particularly likely to impact the efficiency and effectiveness of task engagement’ (Elliot et al., 2011, p. 634). On the other hand, the interpersonal nature of normative competence feedback can distort its purpose from a tool for acquiring competence information per se into an instrument for raising self-vulnerability concerns (e.g. self-presentation, self-validation, self-protection) in the hands of social agents (i.e. parents, teachers, coaches’ emphasis on normative competence as a source of ‘good/desirable’ characteristics, pleasing others, and validation of self-worth) (Elliot, 1999; Elliot & Moller, 2003). Other ‘problematic features’ of Pap goals include the potential disruption of task absorption and flow due to the separation of task performance from competence feedback, and an external sense of control, as feedback is reliant on others (Elliot & Moller, 2003).

When Elliot and colleagues (2011) elaborated on the nature and ‘mechanics’ of competence evaluation in relation to three standards (task, self and others), they articulated an important point about the concrete and abstract nature of the ‘others’ standard. Although they focused on the validation of two mastery standards, the distinction between the concrete and abstract comparison targets may hold the key to understanding the process responsible for adaptive and maladaptive effects of Pap goal regulation. Elliot and associates pointed out that obtaining

other-based feedback varies in complexity between comparison made with concrete, present others ('only moderately more complex than task-based comparison' p.633) and abstract aggregate normative information ('similar in complexity to self-based comparison' p. 634); the former is more direct, immediate and ongoing, derived during the process of task engagement, whereas the latter type of feedback is separate from the task, received at another person's discretion often publically and after some delay, and 'the standard of evaluation is not typically calibrated to provide optimal challenge' (p. 634). Furthermore, in this distinction it is implicitly acknowledged that social comparison with present others allows for both performance outcome/product-based as well as process-based feedback, while social comparison with abstract normative standards (e.g. grades in academia, points or ranking in sport) provides only outcome-based feedback.

It follows that the problematic features of Pap goal regulation through social comparison (Elliot & Moller, 2003) are less problematic for the concrete than abstract types of standards as individuals: 1) have control over the strategic selection of a comparison target; 2) may select one or more comparison targets (i.e. slightly better or worse off) that are perceived to be 'optimally' challenging; 3) feedback derived is immediate, private, and process- or outcome-based; and 4) may compare with peers for the purpose of demonstrating superior ability or mastering /improving...more than others.

In conclusion, the current findings appear to support the benefits of a motivational profile high in both Pap and Map goals for SR as goal progress would be monitored in relation to multiple standards (i.e. self and social), resulting in more objective perceptions of competence. Future research should identify whether individuals with different achievement goals/profiles engage in upward or downward social comparison with perceived similar or dissimilar targets, under what contextual circumstances, for what purpose and with what consequences. For example, a recent study showed that individuals who view ability as malleable focused on upward comparison after failure feedback (Nussbaum & Dweck, 2008). An integration of achievement goal and social comparison theories could lead to practical guidelines for the use of both self- *and* social-monitoring/evaluation in the service of Pap *and* Map goals during different stages of learning and levels of performance.

6.1.3. Motivational Regulation through Self-Reward and Self-Criticism

Approach goals had indirect effects on self-motivation through metacognitive strategies and goal efficacy. In both domains and cultures, the activation of approach goals and setting of personal standards initiated a series of SR processes such as planning, self-monitoring and social comparison. This metacognitive activity provides individuals with positive or negative feedback on goal progress. Cognitive and affective reactions to goal progress (Koestner, Lekes, Powers & Chicoine, 2002) such as satisfaction and dissatisfaction prompt individuals to control (i.e. maintain or enhance) motivation and effort through self-reward and self-criticism.

Both Map and Pap goals foster the use of self-motivation through reward and criticism, but in different degrees. Across domains and cultures, a focus on Map, planning and self-monitoring leads to evaluations of sufficient and insufficient progress followed by reward and criticism respectively. However, due to a strong sense of goal efficacy, Map individuals were more likely to perceive and reward satisfactory progress (across domains in an individualistic culture), and were less likely to dwell on and criticise poor progress (across cultures in important life domains such as academia and high level sport). Their resilience to negative feedback could be explained in terms of fewer self-defeating thoughts and selection of self-improvement, rather than self-defensive strategies, after failure (Gano-Overway, 2008; Nussbaum & Dweck, 2008).

Moreover, across domains and cultures a focus on Pap and social comparison rarely led to satisfaction with progress and self-rewarding behaviour, possibly because the affective consequences of positive normative feedback act as a reward (Fishbach & Finklestein, 2012); however, dissatisfaction with normative progress may or may not be criticised depending on the cultural interpretations of negative social feedback as undesirable in individualistic cultures or useful in collectivistic cultures (Heine et al., 2000; White & Lehman, 2005) – across domains in the UK, dissatisfaction and self-criticism were likely to follow social

comparison, while in Romania, social comparison did not occasion self-criticism regardless whether it was motivated by Pap or Pav goals.

Previous research on the relation between motivation and SR is usually limited to the independent direct effects of motivational beliefs on the use of cognitive and metacognitive strategies. In contrast, few studies have investigated the use of motivational regulation strategies in general, and self-consequating in particular. Moreover, these studies operationalised self-consequating as self-reward only despite its conceptualisation as positive and negative self-reinforcement (i.e. the use of both rewards and punishments) (Wolters, 2003). Supporting the current findings, this literature showed that individuals engage in a number of motivational regulation strategies: a) students with a focus on Map and Pap goals use self-reward, self-praise, performance and mastery-based self-talk, interest, value and self-efficacy enhancement strategies and, (for Pap only) critical self-evaluations after failure (Bembenutty, 1999; Kaplan et al., 2009; Lam, Yim, Law & Cheung, 2004; Wolters & Rosenthal, 2000); b) athletes engage in positive self-talk and motivational mastery and performance based imagery (Cumming et al., 2002; Harwood et al., 2003; 2004; Van de Pol & Kavussanu, 2011); and c) exercisers self-determination index (a correlate of Map) was positively related to the use of self-reward (Lutz, Karoly & Okun, 2008).

The links between achievement goals and motivation control strategies found in this thesis support theoretical predictions. Map and Pap goals attach different meanings to positive and negative feedback, and therefore place more emphasis on self-reward and self-criticism respectively. A Map goal is more likely to foster positive feedback, satisfaction with progress and self-reward, as well as resilience to insufficient progress, and little or no self-criticism for several reasons: mastery standards are flexible, therefore perceptions of progress are easier to obtain; the belief that ability can be improved, and that mistakes and setbacks can be overcome through effort, persistence and/or improved strategies (Ames & Archer, 1988; Dweck, 1999; Dweck & Elliott, 1983; Dweck & Leggett, 1988; Nicholls, 1989). On the other hand, Pap is more likely to foster perceptions of poor progress, dissatisfaction and self-criticism than satisfaction with progress and self-reward because: perceptions of progress are more difficult to obtain with normative standards; beliefs that ability is a fixed capacity and

therefore mistakes or setbacks reflect a lack of innate talent which cannot be significantly improved through effort.

From a practical perspective, self-criticism in the service of Pap may enhance motivation and persistence only in some circumstances: for example, in the short term while progress is still perceived as possible ability may not be questioned (e.g. when the discrepancy is small and the task is well learned; Bandura & Jourden, 1991); however, repeated dissatisfaction with normative goal progress and self-criticism could lead individuals to question their (innate) ability, and either disengage from the task, lower their goals (Donovan & Williams, 2003) or switch to a Pav goal (a focus on avoiding normative incompetence) (Senko & Harackiewicz, 2005b). Future research should investigate, the relative value of self-criticism as a motivational strategy in the service of Pap, a broader range of motivation regulation strategies (e.g. mastery and performance self-talk, interest and self-efficacy enhancement; Wolters, Pintrich & Karabenick, 2005) and emotion regulation strategies (e.g. Tyson, Linnenbrink-Garcia, & Hill, 2009), and the relation between feedback attribution and self-motivation strategies. Information about students and athletes' preferred motivation and emotion regulation strategies and their adaptive or maladaptive nature in the service of different achievement goals would be valuable for educators and coaches.

6.2. Avoidance Goals and Self-Regulation

Avoidance goals focus on failure, and this negative hub of SR activity evokes and perpetuates threat, anxiety, distractions, rumination, reduced cognitive flexibility (Derryberry & Reed, 1994; Elliot & Harackiewicz, 1996; Pekrun et al., 2006; 2009), and sensitivity to negative information and events (Elliot, Gable, & Mapes, 2006; Idson, Liberman & Higgins, 2000). These negative experiences and processes undermine perceived goal progress (Elliot & Sheldon, 1997; Elliot, Sheldon, & Church, 1997) and, as shown in this thesis, promote little or no SR activity across domains and cultures.

Pav was not related to goal commitment indices (efficacy and value) or SR strategies in all contexts but one (elite sport); individuals who fear displaying normative incompetence do not

engage in an organised, systematic approach to SR through goal setting, planning, progress monitoring and self-reinforcement, in low to moderately competitive domains (i.e. exercise, low level sport and academia) where the public display of normative failure is low. Similar findings have been reported in the literature: in academia, Pav had null or negative relations with adaptive beliefs and SR strategies such as self-efficacy, perceived competence, metacognition and effort regulation, and positive links with maladaptive SR strategies such as a disorganized learning style, self-handicapping, negative self-related thoughts and the use of negative-based incentives (Bembenutty, 1999; Braten et al., 2004; Dickhauser, Buch & Dichauser, 2011; Elliot, McGregor, & Gable, 1999; Howell & Watson, 2007; Senko & Miles, 2008); while in physical activity settings Pav predicted the use of self-handicapping (Cury, Da Fonseca, Rufo, Peres, & Sarazzin, 2003; Elliot, Cury, Fryer, & Huguet, 2006; Ommundsen 2001, 2004, 2006).

On the other hand, in highly challenging or threatening settings such as elite sport, where few succeed, it was fear of public normative failure that prompted a keen interest in monitoring peers' progress, little self-rewarding and no self-criticism. Athletes who reach elite or sub-elite status have already demonstrated their superiority over most of their peers, and the fear of losing this hard earned place at the top of the hierarchy motivates them to monitor their competitors' strengths and weakness; following on from this, positive social comparisons are likely to reduce their fear of normative failure and may be perceived as rewarding (Fishbach & Finklesten, 2012), while negative social comparison is seen as valuable for optimising future training. An alternative explanation is that Pav promotes social comparison only in elite athletes socialised in the mould of collectivistic concerns (i.e. fear of failure, avoidance of negative social comparison; Hamamura & Heine, 2008; Zusho, Pintrich, & Cortina, 2005).

Mav had moderate positive relations with self-criticism across domains and cultures, and a weak indirect negative link to planning and self-monitoring through low self-efficacy, in all domains in the UK. When students, athletes and exercisers fear self-referenced failure (i.e. forgetting information, losing sport skills or underperforming, failing to adhere to a fitness regimen) they lack confidence in their personal goals, anticipate failure, avoid planning and monitoring, and control effort through self-criticism. It seems that in the absence of objective

feedback based on progress monitoring and evaluation the negative affect generated by Mav leads to self-criticism. This finding supports the view that ‘affect or feelings provide feedback for SR even when they are not triggered by performance feedback’ (Fishbach & Finkelstein, 2012, p. 207). Literature support comes from a handful of studies in education: one study reported an indirect negative relation between Mav and metacognitive regulation through low self-efficacy (Coutinho & Neuman, 2008), while others found null relations with self-efficacy and metacognition, and positive links to external regulation, procrastination and disorganization (Bartels & Megun-Jackson, 2009; Conroy, Kaye & Coatsworth, 2006; Howell & Watson, 2007; Malka & Covington, 2005). High Mav individuals may be perfectionists caught in a vicious circle of unrealistically difficult standards, lack of confidence in achieving them, a disorganised approach to goal pursuit, constant dissatisfaction with goal progress and self-criticism; ultimately, in a self-fulfilling prophecy fashion, these processes reinforce their fear and perception of personal failure.

Consistent with the contemporary achievement goal theory and research, the current data support a general view of individuals motivated by fear of failure (normative or self-referenced) as poor self-regulators, who resort to defensive reactions such as procrastination, task avoidance, cognitive disengagement, apathy and helplessness (Zimmerman, 2008); who have undeveloped schemas for how to learn, how to motivate themselves to learn and how to self-correct their actions (Brophy, 2005); and who ‘although aware of their lack of success, they can neither understand the reasons for their poor performance nor envisage the strategies and behaviour change required to alter their fortunes’ (Pajares, 2008, p. 119).

Designed to facilitate survival, avoidance motivation is generally aversive and limited in scope: when effective can lead to the absence of negative outcomes, and when ineffective to the presence of negative outcomes (Elliot, 2006). Avoidance motivation is experienced as stressful, and even when effective can inhibit enjoyment and well-being (Elliot & Sheldon, 1997, 1998); it can lead to missed opportunities for growth and development, and, in a self-fulfilling fashion, can produce the very negative outcomes that it is designed to avoid (e.g. Cury et al., 2006). The only caveat to the aversive nature of avoidance goals may be in collectivistic cultures, where some positive correlates have been documented (i.e. achievement

motive, surface learning and well-being) (Fryer & Elliot, 2008; Liem, Lau, & Nie, 2008; Zusho et al., 2005). In line with this more positive view, the thesis revealed, for the first time, that avoidance motivated individuals engaged in some proactive SR strategies: regardless of cultural background, students, athletes and exercisers guided by Mav controlled their motivation through self-criticism; while Pav fostered social comparison, but only in specific circumstances (i.e. elite sport in a collectivistic culture).

In conclusion, these findings raise two important empirical and applied issues. Firstly, Pav may not be as so unequivocally dysfunctional as portrayed in the literature. The SR pattern associated with Pav in Romanian elite athletes (including social comparison, the absence of self-criticism and even some self-rewarding) suggests that Pav may be adaptive for some individuals (i.e. those operating close to their potential), in some domains (i.e. highly competitive elite sport where winning is the only meaning of success) and in some cultures (i.e. collectivistic cultures where avoiding failure outside one's group promotes harmonious in-group relations). Secondly, the nature of SR strategies as adaptive or maladaptive may vary according to the goal or purpose they serve, and it may be a matter of degree: for example, self-criticism may be adaptive when engendered by Map and Pap (to a lesser extent for the latter), and it may be maladaptive when promoted by Mav and (possibly) Pav (more so for the latter).

6.3. Achievement Goals and Personal Goals Attributes: The Reason-Standard Complex

According to the reason-standard complex (Elliot et al., 2011), individuals' achievement goals or their abstract reasons for engagement in an achievement domain exert their influence on various outcomes, such as SR processes, through the concrete standards or goals they select for themselves. Therefore, personal goals attributes such as efficacy, importance, difficulty, specificity, and focus play an important role in the relations between achievement goals and SR processes. Specifically, this thesis investigated the reason-standard complex by addressing questions related to the mediating role of goal efficacy and value in different contexts; the moderating role of goal difficulty and specificity in academic settings; and the nature of personal goal focus in education, sport and exercise domains.

6.3.1. Personal Goals Efficacy and Value

Firstly, in different domains and cultures, goal value beliefs were closely tied to perceptions of goal efficacy: the more confident individuals were about achieving a goal the more they valued it. These findings are consistent with the expectancy-value theory (Eccles & Wigfield, 2002) and research (e.g. Eccles & Wigfield, 1995), and inconsistent with the original need achievement theory (Atkinson, 1957) which predicted a negative relation between the two variables (i.e. individuals value difficult tasks for which they have low expectancy for success).

Secondly, in line with achievement goal and goal setting research, personal goal efficacy and value (separately or together) were important mechanisms through which Map, Pap and Mav goals exerted their influence on most SR strategies investigated (i.e. planning, self-monitoring, self-reward and self-criticism), but one (social comparison). These findings suggest that individuals who focus on success need to be convinced of their ability to achieve personal goals in order to invest time and effort in SR, while those who focus on self-referenced failure consider proactive SR strategies of little or no relevance because they believe their goals to be unattainable and unimportant.

6.3.2. Personal Goals Difficulty and Specificity

In study 1, the moderating role of personal goal difficulty/specificity was investigated by testing the achievement goal-SR model in two groups simultaneously, one with easy/vague goals (mastery and performance) and the other with difficult/specific goals (performance). The model paths were invariant across samples indicating that the relations between achievement goals and SR was not moderated by personal goal difficulty/specificity.

Differences in the path coefficients provided evidence that goal difficulty/specificity moderated the relations between achievement goals and SR: when students set easy/vague personal goals, achievement goals had more potent effects on the use of SR strategies than

when specific/difficult goals were set. Contrasting findings were reported by Seijts et al. (2004). Their experimental study focused on the effects of three dispositional goal orientations (equivalent to Map, Pap, and Pav goals) on performance in a computer simulation, and the moderating role of three assigned goals conditions on these effects (easy/vague 'do-your-best' goal, mastery and performance difficult/specific goals). The authors reported that achievement goal effects on performance were weakened (reduced to non-significant) when assigned goals were difficult and specific (regardless of goal type, mastery or performance) in comparison with the easy/vague 'do-your-best' goals (when the effects were significant).

The findings reported by Seijts et al. (2004) seem to suggest that it is the combined difficulty and specificity attributes of personal goals not the type (mastery versus performance) that moderate achievement goal effects on performance. Furthermore, Senko and Harackiewicz (2005a; study 2) focused on variations in performance on a word puzzle game between three achievement goal conditions (mastery standard/easy goal, and mastery and performance difficult goals), and reported that students performed better with difficult achievement goals (regardless of type) than the easy mastery goal. Additional literature showed that goal difficulty/specificity (i.e. expected grades) mediated the effects of three achievement goals on academic performance (i.e. actual grade) (Lee, Sheldon & Turban, 2003; Roney & O'Connor, 2008; Vande Walle, Cron & Slocum, 2001). No studies were found in the physical activity literature on the interactive effects of achievement goals and target goal difficulty/specificity on SR or other outcomes.

Taken together, these findings contribute to two main debates in the goal literature. First, a longstanding controversy exists in the goal setting literature over the relative strength of dispositions and self-set goal effects (Locke & Latham, 2002); specifically, the results of study 1 and previous literature seem to indicate that the strength of goal effects depends on the outcome variable investigated – target goals may have a more potent effect than dispositional achievement goals on some measures of performance (e.g. word puzzle game, computer simulations), but not on perceptions of goal efficacy, goal value and the use of SR strategies (measured as individual differences). Secondly, the tentative suggestion that goal difficulty may be equally important as goal type supports the 'effort-arousal mechanism' purported to

explain Map and Pap effects on performance (i.e. challenging standards arouse greater effort which enables task success) (Senko, Hulleman & Harackiewicz, 2011). Further research should attend to the combined effects of achievement goals and personal standard attributes (i.e. type, difficulty, specificity) on SR processes and performance in the education and sport domains.

6.3.3. Personal Goals Focus

The focus of goal content has recently become a topical issue in the achievement goal theory (Senko et al., 2011). Qualitative investigations of achievement goal content have generally not supported the theorised four goal conceptualisation, leading to the questioning of external validity or phenomenological reality of achievement goals measured via questionnaires (e.g. Brophy, 2005; Roeser, 2004; Urdan & Mestas, 2006). The qualitative evaluation of personal goal contents in this thesis revealed that: 1) both Romanian and English students set mostly approach outcome-*grades* goals (65% and 68% respectively), a few or no comparative/normative goals (16% and 0% respectively) and some mastery goals (4% and 32% respectively); 2) in the physical activity domain a sharp contrast was found between high level athletes who were mostly concerned with winning (80% normative and 18% mastery goals) and low level student-athletes (23% normative goals, 18% selection-related goals, and 59% mastery goals) or exercisers (100% mastery goals) who were mostly concerned with mastery and improvement; and 3) avoidance goals were conspicuous through their absence in most contexts investigated, and only 10% of Romanian students set avoidance goals (i.e. avoid failing exams).

The Phenomenological Reality of Avoidance Goals. The current findings indicated that quantitative measures of achievement goals overestimate the natural occurrence of avoidance goals in academic, sport and exercise settings as it was reported by others in academia (Elliot & Sheldon, 1997; Elliot et al., 1997; Horowitz, 2010; Job, Langens & Brandstatten, 2009; Okun, Fairhome, Karoly, Ruehlman, & Newton, 2006) and physical education settings (Sideridis & Mouratidis, 2008). For example, in physical education, Sideridis and Mouratidis (2008) reported low relations between students' achievement goals assessed through forced-

choice and open-ended methods; that Mav goals were nonexistent, and Pav goals were misinterpreted as mastery or affectivity goals. Moreover, there is evidence showing that when students were explicitly prompted to set approach and avoidance goals, the prevalence of avoidance goals was under 30%; and when not prompted, the frequency dropped to under 10% (Elliot & Sheldon, 1997; Elliot et al., 1997; Schnelle, Brandstater & Knopfel, 2010). Therefore, many researchers argued that young students and athletes view approach and avoidance goals as being the same – concern for performing worse than others is indistinguishable from the desire to perform better than others (Ciani & Sheldon, 2010; Kaplan et al., 2009; Roeser, 2004; Urdan & Mestas, 2006). The current findings seem to support the extension of this argument to adult individuals, across domains and cultures.

An alternative explanation for the low incidence of avoidance goals is offered by the hierarchical reason-standard complex: standards may mostly be positive or approach in nature because they can serve both approach and avoidance higher order abstract purposes of engagement. For example, setting grade-related standards such as ‘getting grades over 60%’ may serve both approach and avoidance reasons – ‘being better than or not being worse than others with 60% grades’ and ‘attaining a sufficient or avoiding an insufficient mastery of course material’ respectively. The approach-avoidance nature of personal standards can be revealed either by identifying the broad purposes which they serve and/or, as showed by Ronney and O’Connor (2008), through measures of standard-related affect (i.e. positive or negative goal frames).

The Phenomenological Reality of Performance/Comparative Goals. On the surface, the thesis results support the argument that questionnaire-based investigations of achievement goals overestimate the natural occurrence of performance-comparative goals in *some settings* such education and exercise, but not in sport. As reported in education, when school and university students were allowed to describe their goals in their own words, they tended to mention grades as one of their main concerns, and rarely referred to peer comparison and competition; (Lemos, 1996; Horowitz, 2010; Okun et al., 2006; Urdan, 2001; Urdan & Mestas, 2006). Moreover, Monique Boekaerts stated in a personal communication that ‘European investigators from several countries have reported little evidence of performance

goals even when using typical Likert-scales measures' and that 'Dutch students not only did not generate performance goal spontaneously but resisted adopting them when they were encouraged to do so' (Brophy, 2005, p. 171).

At a deeper level of analysis, in education, judgements about the natural occurrence of performance goals is greatly hindered by disagreements over the conceptualisation of these goals in the literature. Performance goals have been defined in relation to: 1) normative-social comparison ('outperforming others'); 2) appearance/approval or self-presentation ('demonstrating competence') (e.g. Elliot, 1999; Grant & Dweck, 2003; Urdan & Mestas, 2006); and 3) outcome or extrinsic goals such as grades (e.g. Brophy, 2005; Horowitz, 2010; Okun et al., 2006; Pintrich, Smith, Garcia & McKeachie, 1993). However, some argued that grades are 'neutral' or 'hybrid' goals in terms of competence definition as they can be used as mastery or performance standards; this view was supported with evidence showing that grades were equally correlated with mastery and performance goals (Grant & Dweck, 2003; Hulleman et al., 2010). Ultimately, many agree that grading is explicitly or implicitly normative in nature and that some types such as task or criterion-grading (relative to curve grading) reduce to some extent this comparative emphasis (e.g. Elliot & Moller, 2003; Elliot & Murayama, 2008; Kaplan & Middleton, 2002).

From an objective contextual standpoint, the English and Romanian academic settings are normative structures (implicitly or explicitly) where some students are more successful than others; however, a system based on criterion grading linked to broad pass/fail evaluations, allows many or most students to succeed with satisfactory or good grades. In such moderately competitive academic contexts, most students seem to focus explicitly on grades rather than on mastery or performance-comparison standards, while implicitly, grades may be used as concrete standards in the service of Pap or Map reasons. Therefore, the low prevalence of comparative-performance standards may be due to how goals are conceptualised (whether grades qualify as performance goals), or on how success is defined in the context (i.e. grades), while individuals may give different meanings to these definitions based on their purposes of engagement.

In contrast to the moderate competitive level of both Romanian and UK academic settings in this thesis, the nature of the physical activity settings varied greatly from non-competitive to low/moderate and high levels of competition (i.e. exercise, university and elite level sport respectively). Therefore, the effects of this contextual variability on the nature of goal contents could be observed. The present findings showed that the natural occurrence of mastery and performance standards was moderated by contextual cues about the probability of success, as suggested by Elliot and Moller (2003): performance-comparative goals were highly prevalent in elite and sub-elite sport where success is narrowly defined as winning, and few succeed; both mastery and performance goals were favoured in low level/university sport where success is more broadly defined as participation-development and outcome-ranking, and many can succeed; and finally, only mastery goals were set in non-competitive exercise settings, where all can succeed. No studies were found on the goal contents of athletes or exercisers. However, physical education students when free to set their own goals, reported performance goals containing strong elements of mastery and social goals (Sideridis & Mouratidis, 2008).

This thesis investigated only the prevalence of different types of personal goals in a variety of contexts (domains and cultures), and not the relation between types of achievement goals (reasons) and personal goals (standards), or the role played by personal goal type in the effects of achievement goals on SR processes. Therefore, there are two important questions for future research: 1) whether reason-standard foci or types can be incongruent as well as congruent and 2) which may be the best combination for SR and other outcomes.

In sport psychology, goal setting specialists suggested a direct correspondence between types of achievement goal orientations (i.e. task/mastery and ego/performance) and types of goals set by individuals (i.e. process, performance and outcome) (Burton & Naylor, 2002; Burton & Weiss, 2008; Kingston & Wilson, 2009). Achievement goal specialists dismissed this straight correspondence as ‘difficult to substantiate at a conceptual or an empirical level (Hall & Kerr, 2001, p. 225), particularly in terms of goal orthogonality (Roberts & Kristiansen, 2012). Although the debate for integration has been lively and informative, progress towards conceptual clarification and coherence remains elusive.

A closer look at the conceptualisation of goals in the achievement goals and goal setting sport literatures could explain the present stalemate: in the definition of achievement goal orientations the abstract standard and reason constructs overlap, while in the goal setting literature the goal is defined as concrete standard only (the what) devoid of reason or purpose (the why). Similarly, Maehr and Zusho (2009) suggested that by separating goal reason (the why) from goal target or standard (the what) researchers could avoid talking across each other about ‘apples and oranges’. The hierarchical reason-standard complex drawn from the achievement goal theory (Elliot et al., 2011): 1) differentiates the abstract reason/why (achievement goals) from the concrete standard/what (personal goals) used to evaluate the attainment of reasons; and 2) it allows for the orthogonality of reasons and a continuum of standards, and therefore for the congruent and incongruent correspondence between types of reasons and standards (i.e. the same standard can serve different reasons, and the same reason can be served by different standards). The idea of incongruence is not new. For example, Pintrich, Conley and Kempler (2003) suggested that an incongruent pattern of normative standards in the service of mastery reasons was possible.

In relation to the second question (i.e. the best combination of reason-standard foci), some preliminary answers have come from a complex experimental study by Kozlowski and Bell (2006): a congruent mastery reason-standard combination was better for SR than an incongruent complex which in turn was better than a congruent performance goals combination for learning a novel complex and dynamic task. However, the authors concluded that ‘the results appear to be driven by whether the focus was mastery or performance’ and that creating ‘a mastery focus [...] is more important than congruency’ (p. 913). Further evidence from experimental studies showed that the relative effectiveness of Map and Pap standards depends on the level of skill automaticity in both academic and sport settings: a learning process goal was better for skill acquisition and a performance outcome goal was better for well learned skills (Zimmerman & Kitsantas, 1996, 1997, 1999).

It is possible, therefore, that the best reason-standard combination depends on the level of expertise and/or task difficulty, complexity or automaticity: a congruent mastery reason-

standard complex may be beneficial for novices learning new skills, while for experts, an incongruent performance reason – mastery standard may be adequate for complex non-automatic tasks, and a congruent performance complex may be desirable for straightforward tasks or automatic skills. Ultimately, for practitioners motivating students and athletes, it may be less about the type of standard per se, and more about creating an optimal combination of reason and standard attributes (i.e. type, difficulty) for the individual's ability/skill relative to task difficulty/complexity.

In conclusion, the reason-standard complex appears to be a useful construct for integrating achievement goals and goal setting paradigms as it provides a deeper understanding of standard attributes as mechanisms of achievement goal effects, and may offer potential answers to the goal content controversy. Drawing on the current data and previous literature it can be concluded that: 1) the standard attributes such as efficacy and value mediate the effects of reasons on some SR strategies; 2) the optimal combination of reason-standard foci and goal difficulty may vary according to individuals' ability/expertise level and task difficulty/complexity; 3) the phenomenological occurrence of different types of standards may be influenced by individual factors such as the achievement purpose they serve, and by contextual factors such as the objective level of competition (how many succeed relative to how many fail); specifically, the low prevalence of some goals (i.e. avoidance, comparative-performance and even mastery) may be due to a genuine lack of concern with these objectives, but it is more likely to be explained by contextual affordances (probability of success) and/or the flexibility of reason-standard foci combination, where approach standards may serve avoidance purposes, and 'neutral' outcome standards (e.g. grades) may serve comparative-performance as well as mastery reasons. From a practical perspective, educators, coaches and exercise professionals should be aware that the effectiveness of goal-setting programs depends not only on matching the goal standard type and difficulty to individuals' ability and task difficulty, but also on their understanding of the purposes of engagement and the optimal combination of purpose and standard for motivation and performance.

6.4. Achievement Goals and Self-Regulation: Cultural Dynamics

Most theories of motivation and SR were developed in Western industrialised cultures (Biddle et al., 2003; Kaplan & Maehr, 2002) which promote a view of the self as a unique independent entity striving to ‘stand out’ (Hamamura & Heine, 2008). Hence the transfer of these theories to collectivistic cultures where the self is viewed as an interdependent, relational entity striving to ‘fit in’, can be problematic. In the sport domain it was proposed that cultural differences may or may not exist depending on the level of sport: the ‘athletic imperative’ perspective predicts no cultural differences between high level athletes due to the universal demands of elite sport; and the ‘cultural influence’ perspective predicts cultural differences between lower level athletes (Chelladurai et al., 1988). In education, the expected cultural differences in achievement goals and SR have received mixed support (McInerney, 2011); while the limited physical education and sport literature has addressed only differences in approach goals also with inconsistent support.

While cultural classifications are useful templates for the comparison of social groups and for testing the cultural fit of a theoretical framework, they ignore important within-group differences in self-construals (McInerney, 2008, 2011). In other words, individuals from the same country may differ in their endorsement of individualistic (IND) and collectivistic (COL) views of the self. For example, participation in team and individual sports may prime COL and IND self-construals, respectively. In line with literature recommendations study 3a investigated mean level differences between elite/sub-elite athletes from the UK and Romania in order to: 1) obtain direct evidence of the IND-COL classification of the two countries after controlling for sport status (athletes versus non-athletes/students) and 2) to obtain a more accurate understanding of contextual differences after eliminating the effects of self-construals.

The preliminary results of study 3a lend partial support to the COL stereotype attached to a former socialist East European country: Romanian young adults, athletes and students, had stronger COL self-views than their English counterparts, but the two groups were similar in IND self-definition. Inconsistent support for cultural stereotypes have been reported before: Germany and Japan differed in IND but not COL (Oyserman, Coon, & Kemmelmeier, 2002) and Estonians were less COL than Russians and Americans (Realo & Allik, 1999).

The main results of study 3a supported the ‘cultural influence’ hypothesis as Romanian elite and sub-elite athletes (regardless of sport type) had more extrinsic goals related to social standing (Pap and Pav) and engaged in more SR activity consistent with these goals (social comparison and self-consequating) than English athletes. The current data are consistent with differences found between PE students and adolescent elite swimmers from East Asia (Japan and Singapore) and North Europe (the UK and Germany) in ego orientation, entity beliefs, and performance climate (Alfermann, Geisler, & Okade, 2013; Morgan, Sproule, McNeill, Kingston, & Wang, 2006; Wang, Liu, Biddle, & Spray, 2005).

Secondly, an interaction of culture and sport type emerged as Romanian team players had a keener interest in the development of their skills (Map) and engaged in more SR instrumental to this purpose (planning and self-monitoring) than English team players (while no differences were found between individual sport athletes from the two countries). These seemingly counterintuitive findings may be due to the particularly strong COL orientation of Romanian players based on the convergent influences of sport and national cultures (i.e. their performance had broader implications beyond the team and club to family, community and country). These results are inconsistent with reports that Asian adolescent elite swimmers and PE students had lower levels of task orientation than their German and American counterparts (Alfermann et al., 2013; Isogai et al., 2003; Kim, Williams, & Gill, 2003).

Finally, in line with the ‘athletic imperative’ perspective, but contrary to expectations, there were no differences between Romanian and English athletes in Mav endorsement. However, their similar level of concern with personal stagnation may be explained in terms of age or stage in athletic career – both groups were relatively young and had ample time to improve. The picture may be different for older athletes. As selection to representative teams is often based on potential for improvement in addition to proven athletic ability, older Romanian athletes may be more worried with a potential plateau in their performance than their English counterparts, in line with the ‘cultural influence’ perspective.

Study 3a provides for the first time an insight into cultural differences in achievement goals and SR between elite and sub-elite adult athletes from two European countries, after taking into account within-country variability in COL self-definition. This finer and sharper analysis

revealed that: in line with the cultural stereotype, team and individual sport athletes from a COL country focused more on ego-social goals (i.e. Pap and Pav) and engaged in more SR activity associated with these goals than athletes from an IND country; 2) fluctuations in mastery goals (Map and Mav) and related SR activity may be better explained by idiosyncratic interactions of cultural, contextual and individual differences such as self-definitions, sport type and level, and possibly age or stage of athletic career. Coaches in COL countries, such as Romania, should make more vigorous efforts to counteract the win oriented culture of elite and sub-elite sport with training climates that emphasise the importance of Map standards and SR strategies to the achievement of Pap goals.

6.5. Achievement Goals and Self-Regulation: Temporal Dynamics

In academic and sport settings, study 4 revealed both stability and change in achievement goals and SR processes. Consistent with prior research in education, achievement goals followed different patterns of temporal change over one academic year: Pap and Mav goals were stable, Map declined steadily and Pav declined at first (semester 1) then was stable (semester 2) (Fryer & Elliot, 2007; Jagacinski, Kumar, Boe, Lam, & Miller, 2010; Muis & Edwards, 2009; Senko & Harackiewicz, 2005b; Shim, Ryan, & Cassady, 2012). The different patterns of Pav change found in the literature (increase or stability) and in study 4 (decline) could be due to the presence and absence of assessments, respectively, during the first semester at university. Furthermore, in line with previous findings in sport and physical education, for student-athletes all four goals declined (Barkoukis, Ntoumanis, & Thogerson-Ntoumani, 2010; Warburton & Spray, 2008, 2009). The average trends of within-individual temporal changes did not apply to all individuals, however all students' Mav levels remained stable over the year.

Goal commitment (efficacy and value) declined and planning and self-monitoring activity remained unchanged during the year in both academic and sport settings, while social comparison and self-reinforcement followed different patterns in the two contexts: both increased in education, while in sport settings social comparison was stable and self-reinforcement declined first then was stable (semesters 1 and 2 respectively). The average

trends for some SR activity were not followed by all student-athletes, however all students' engagement in social comparison and self-reinforcement increased, and all athletes' goal commitment and involvement in self-reinforcement declined over the year. The few existing studies reported similar decreases in perceived competence and value in both education and sport domains (Choinard & Roy, 2008; Rodriguez, Wigfield, & Eccles, 2003; Smith, Sinclair, & Chapman, 2002; Xiang, McBride, & Guan, 2004), while no studies were found on the temporal changes of SR processes.

In both settings, latent growth curve analyses showed that Map changes were positively associated with changes in goal commitment, planning, self-monitoring and self-reinforcement; Pap fluctuations were mirrored by changes in social comparison and self-reinforcement activity; and temporal variations in Mav and SR were unrelated. Additionally, structural equation modelling analyses confirmed the temporal invariance of model paths identified in studies 1 and 2 respectively: the relations between achievement goals and SR were the same at the start, middle and end of the academic year and athletic season. Study 4 extends the small body of research which demonstrated that longitudinal changes in approach goals were related to changes in self-efficacy, perceived competence, self-esteem, self-worth and academic performance; and that cross-sectional goal relations to some of these outcomes were invariant over time (Jagacinski et al., 2010; Meece & Miller, 2001; O'Keefe, Ben-Eliyahu & Linnenbrink-Garcia, 2013; Paulick, Watermann, & Nuckles, 2013; Shim, Ryan, & Anderson, 2008; Shim et al., 2012). Future research should investigate the implications of achievement goal changes for a broader range of SR strategies, and more generally, cognitive, affective and behavioural outcomes in different domains.

According to the hierarchical model of achievement motivation, Pap and Mav goals are expected to be stable due to their mixed antecedents, and Map and Pav goals are expected to fluctuate due to their purely positive and negative antecedents respectively (Cury, Elliot, et al., 2006; Elliot, 2005). In education, this pattern of stability and change was supported by study 4 data. Moreover, the characteristics of the first year environment seem to reinforce the stability of Pap and the decline of Map through a consistent emphasis on grades, and a compulsory diet of classes taught in large lecture format which do not allow for material

adaptations to students' interests or learning styles. In sport settings, the theoretical prediction of Map and Pav change was supported, while the stability of Pap and Mav was not. Nevertheless, the pattern of decline in all goals endorsement could be due to the decreasing importance of sport involvement in the context of increasing academic demands during the year.

In conclusion, consistent with theoretical predictions, achievement goals and SR processes are related in a similar fashion both at 'static' (cross-sectional) and 'dynamic' (longitudinal) levels. Similar to studies 1 and 2 in both domains the level and changes in Map were associated with the level and changes in goal commitment, planning, self-monitoring and self-motivation, while the level and changes in Pap were associated with the level and changes in social comparison and self-reinforcement. From a practical perspective, study 4 showed that changes in approach goals have implications for student-athletes use of SR over time. Specifically, the cost of a decline in Map endorsement is high as it initiates a decrease in personal goal efficacy and value, planning, self-monitoring and self-reinforcement. Although not applying to all students, this average trend of steady decline in Map coupled with a persistent focus on Pap and social comparison is rather worrying as a plethora of research advocate high levels of Map to counteract some negative effects of Pap (Roberts et al., 2007). The findings reinforce the recommendations from the achievement goal literature that educators and coaches should create mastery climates, and further emphasise the importance of sustaining these efforts over time as objective levels of competition increase.

6.6. Methodological Limitations

Participants' Characteristics

The participants in the present studies were university student-athletes with a narrow age range. Therefore, the SR model proposed may not generalise to an older or younger population in both domains. Furthermore, while the samples in studies 1, 2 and 3 included student-athletes from different years of study, the participants in study 4 were only year one students and the results of this study may not generalise to students from years two and three.

Additionally, gender as a variable was not considered in this thesis, and any gender effects were controlled by including relatively equal numbers of males and females in each sample.

Contextual Characteristics

The five contexts used in this thesis varied in terms of life domains (exercise, sport, academic) and cultures (individualistic and collectivistic). Although literature evidence suggested differences in motivation and SR between domains and cultures, the limited literature on their relationships provided insufficient or mixed indications regarding the generalisation across domains and cultures. An additional broad contextual dimension (the objective competitive level or probability of success), was construed as a common denominator for the original five contexts in order to explain model differences that may not follow domain or cultural divides. This contextual dimension was based on suggestions made by Elliot and Moller (2003) that achievement domains vary in terms of how many succeed relative to how many fail (i.e. the probability of success/failure). While the competitive level dimension (non-competitive, low/moderate and high) cuts across domains and cultures, it could also be said that it confounds these variables (e.g. high level – elite sport in a collectivistic culture; low/moderate level – university sport and academic contexts in an individualistic culture). Therefore, caution is recommended when interpreting model differences in terms of this broad dimension. Ideally, different competitive levels should be represented within the same domain and culture in order to avoid their combined effects. Additionally, the cultural generalisation of SR across individualistic and collectivistic types of cultures suggested by the current data should be regarded as tentative as the two countries differed only in one of these dimensions (i.e. collectivism). Finally, the motivational climate (i.e. perceptions of situational goals), an important moderator of achievement goal effects, has not been investigated in this thesis, and its inclusion in future research is strongly recommended. There is some evidence that mastery climate is conducive to some types of regulation (help seeking, metacognitive and effort regulation) and some of these effects are mediated by task orientation; the effects of performance climate were mixed (i.e. null or positive and weak) (Theodosiou & Papaioannou, 2006; Ommundsen, 2006).

Measures

Achievement Goals Questionnaire (AGQ; Elliot & McGregor, 2001) has demonstrated good validity indices in many studies since its publication, including the four studies in this thesis. However, a recent critique of AGQ (Elliot & Murayama, 2008) highlighted conceptual inconsistencies in some of its items: failure to assess goals per se; collapse of reason and aim/standard; applicability to both Map and Pap scales; excludes the possibility of independent goal pursuit; focus on extreme normative referents; different amounts of affective content; and different emphasis on social comparison. Lack of conceptual rigor in the operationalization of achievement goals can make it difficult to interpret with confidence the supportive or unsupportive nature of empirical findings in relation to theoretical predictions, and slows down theoretical progress and practical application (Elliot & Murayama, 2008). Despite these AGQ weaknesses, it is important to note that the AGQ-Revised scales ‘yielded results fully in accord with those from the original scales’ in terms of antecedents and consequences (Elliot & Murayama, 2008, p. 625). Therefore, significant variations in the SR model proposed here are not expected if the more conceptually rigorous AGQ-Revised is used.

The Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995). Self-report measures about how individuals regulate their goal pursuit (such as the GSAB) may be inaccurate and real-time event measures (e.g. direct observations, think-aloud protocols, structured diaries) are required to corroborate self-reported data (Kitsantas & Kavussanu, 2011; Zimmerman, 2011). Moreover, GSAB has some important limitations in the conceptualisation of SR:

- The goal efficacy measure compounds different efficacy standards depending on the type of goal set by students and athletes (i.e. mastery-task, mastery-self or performance-others), while the goal value measure captures only the importance aspect of the value concept. Recent theorising and research supports the importance of differentiating between three standards of competence (i.e. task, self and others) (Elliot, 2005; Spray & Warburton, 2011) and four conceptualisation of value (i.e. importance, utility, interest, cost) (Eccles,

2005). Future research should address the relations between achievement goals and different types of competence/efficacy and value.

- Although the Self-Monitoring scale is conceptualised as separate from other SR scales, two of its items could not be statistically separated from the Planning measure in studies 1 and 2, and their separate links to achievement goals could not be investigated. It is possible that in every-day life individuals use the two strategies together in a dynamic fashion and do not think of them as separate. Other studies have reported low internal reliability (e.g. $\alpha = .62$) for Self-Monitoring, and high correlations with Planning (e.g. $r = .72$) (Lutz et al., 2008; Macdonald & Palfai, 2008). These reports suggest a low unique predictive ability as an independent subscale and support the dynamic phenomenological connection with Planning suggested earlier. Future research should address the content of the Self-Monitoring scale (as two items loaded on other SR subscales) and its relation with the Planning subscale.
- The Social Comparison scale is conceived as comparison with concrete others who are doing better, worse than or similar to the respondent (i.e. upward, downward and parallel comparisons). Therefore, it is not clear which of these comparison types were favoured by individuals in different samples or within a sample. Future research should employ measures that differentiate between types of social comparison for a finer grained analysis of achievement goal effects. The social comparison literature suggests that this could be a productive avenue of research.
- The Self-Reward measure included in GSAB is a typical strategy for enhancing extrinsic motivation; the inclusion in the present SR model of intrinsic motivation type strategies scale alongside Self-Reward may reduce the strength of its relation to Map (possibly to non-significant).

Design

The correlational design employed in this thesis is a limitation because the concurrent collection of data does not allow causal or bi-directional interpretations of relations between model variables. The assumption that goals influence SR strategy use was based on the conceptualisation of achievement goals as broad cognitive frameworks (Elliot, 2005); however, SR models allow for cyclical and bidirectional links between model components (Pintrich, 2000a). Future research should employ longitudinal designs which allow for the examination of causal links between model variables.

6.7. Thesis Contributions: Theoretical, Practical and Research Implications

Theoretical Implications

Differentiation and integration are two major complementary trends in achievement goal theory and research in relation to the conceptualisation of goals (Kaplan & Maehr, 2007). Achievement goals have been partitioned into approach and avoidance (Elliot, 1997), two types of mastery goals (Elliot et al., 2011), four types of performance goals (Grant & Dweck, 2003) and two levels of analysis (abstract reason and concrete standard) (Elliot et al., 2011). Moreover, achievement goals have been integrated into more parsimonious, hierarchical frameworks linking for example motives to aims (Elliot, 1997), reasons to standards (Elliot et al., 2011) and goals to SR action (Kaplan & Maehr, 2002; Kaplan et al., 2009). This thesis made a contribution to both trends by integrating three separate goal constructs: the reason (why), the standard (what) and SR action (how).

The Reason-Standard Complex. Little consensus exists in the achievement goal literature between two goal conceptualisations – a narrow, aim or standard only definition, separate from reason, and a broad definition where reason and standard are combined in overarching orientations (Elliot, 2006; Urdan & Mestas, 2006). Although the need to separate and integrate the reason and standard constructs has been noted for some time (e.g. Pintrich et al., 2003) this recommendation was only recently endorsed by Elliot, the main proponent of the aim/standard only goal definition (Elliot et al., 2011). Elliot and colleagues concluded that the reason-standard complex ‘brings definitional precision and clarity, while at the same time

affording tremendous range and flexibility in accounting for real world achievement behaviour' (p. 644).

In parallel to developments in the achievement goal literature, the related area of goal setting theorising and research has focused almost exclusively on goal states, defined as targets, aims or standards, and downplayed the importance of dispositions such as goal orientations (i.e. purpose or reason) to motivation and performance (Locke & Latham, 2007; Locke, Shaw, Saari & Latham, 1981). Interestingly, despite the conceptual overlap noted between the aim or standard definition in both achievement goals and goal settings literatures (Roberts et al., 2007; Papaioannou et al., 2012) 'one research group rarely takes into account findings from the other (Seijts et al., 2004, p. 227). Moreover, some integration attempts made in the sport domain have not been as generative as intended due to a lack of conceptual coherence (Roberts & Kristiansen, 2012).

Following calls from both literatures for integrative work (Kozlowski & Bell, 2006; Roberts & Kristiansen, 2012), this thesis: 1) acknowledged the value of the reason-standard complex as a theoretical framework for integrating achievement goal and goal setting paradigms; 2) captured more accurately the phenomenology of personal goal content by employing a qualitative measure of individuals' self-set standards; and 3) made a modest contribution towards understanding the interactive effects of achievement goals (reasons) and personal goals (standards) attributes (efficacy, value, difficulty/specificity).

Achievement Goal and Self-Regulated Action Patterns. Early conceptualisations of achievement goals encompassed both the reason for engagement and the action taken to achieve that reason (Maehr, 1984; Nicholls, 1989). Drawing on this early theorising, Kaplan and Maehr (2002) proposed an integrated model of achievement goals and SR strategies which emphasised the qualitative associations between them: mastery and performance goals would be linked to different SR strategies rather than to higher or lower levels of SR. Despite both early and recent theoretical integration of achievement goals and action, most empirical research to date treats motivation and SR as distinct theoretical constructs related in a

quantitative manner such that higher motivation leads to greater use of SR (Kaplan et al., 2009).

In line with calls for an integrated approach to motivation (why/what) and action (how), this thesis investigated four achievement goals, personal goal attributes and SR strategies, and revealed four distinct goal-strategy patterns:

- 1) the Map goal pattern – individuals who engage in an achievement domain for the purpose of personal improvement and task mastery tend to: set personally challenging and valued goals, plan their course of action, monitor and evaluate goal progress, and keep themselves motivated through rewards rather than criticism; their motivation and satisfaction are expected to be high as corrective action is taken in the face of setbacks.
- 2) the Pap goal pattern – individuals who engage for the purpose of outperforming their peers are more interested in monitoring and evaluation of progress through social comparison than in planning and self-monitoring, and are more likely to urge themselves on through self-criticism than self-reward; their motivation and satisfaction are expected to be variable due to the unpredictable nature of normative success, and low tolerance for setbacks.
- 3) the Mav goal pattern – individuals driven by the fear of failing personal standards, anticipate failure, and this negative affective feedback, combined with the absence of objective cognitive feedback from monitoring of goal progress, provides grounds for constant self-criticism; their motivation may be moderate or high, but their satisfaction is more likely to be low.
- 4) the Pav goal pattern – individuals who avoid comparative failure consider an organised approach to goal pursuit (through planning, monitoring and self-motivation strategies) as irrelevant in the face of inevitable failure, and (as reported by others) may prefer defensive strategies to alleviate ego threat; low levels of motivation and satisfaction are conducive to minimal engagement or apathy.

The Temporal Stability and Contextual Generalisation of Goal-Strategy Patterns. The perceived relevance of a strategy to a specific purpose of engagement was expected to change according to domain characteristics and/or cultural imperatives (Kaplan & Maehr, 2002), but not according to time (e.g. Shim et al., 2012). Therefore, this thesis investigated the temporal and contextual dynamics of achievement goals and SR patterns over one year in the academic and physical activity domains (in the UK); and across five contexts – the academic and high level sport (elite and sub-elite) settings in a collectivistic culture (Romania), and the academic, low level university sport and exercise settings in an individualistic culture (the UK). These environments were selected due to important variations in some objective characteristics such as: competitive level or the probability of normative success (how many succeed relative to how many fail), the incentive value of success (financial incentives were present in Romania but not in the UK), the public versus private nature of performance and feedback (in the physical activity and education domains respectively), and the cultural value of failure avoidance and fitting in versus challenge seeking and standing out in the two countries.

The current data revealed that, despite cultural and temporal mean level variations in achievement goals, personal goal commitment and SR strategies, the relations between these constructs were stable over one year in education and physical activity settings, and generalised to a large extent across five contexts. Specifically, the two mastery goal patterns were stable across domains and cultures, while the two performance goal patterns were moderated by the competitive level of the context (rather than by the domain or culture per se): Pap's positive and Pav's null links to social comparison were stable across four (moderate-to-low) competitive contexts (i.e. two academic, and two physical activity settings – university level sport, and exercise) then reversed, creating two new patterns in the highly competitive elite sport setting (null and positive links for Pap and Pav respectively). Finally, a segment of the Pap goal pattern was moderated by culture: social comparison led to self-criticism in all domains in the UK only.

An Integrated Achievement Motivation and Self-Regulation Model The findings of this thesis support a view of motivation integrated with action (i.e. motivated action orientations),

implying that the meaning of achievement in education, sport and exercise settings, in individualistic and collectivistic cultures includes the reasons for engagement, the standards or criteria of success and the strategies used during goal pursuit. Secondly, it can be said that mastery action orientations are domain and culture general; performance action orientations are moderated by the objective probability of normative success inherent in the environment, and that goal-action orientations remain stable over time. Thirdly, personal goals or standards of success are important components of motivated action orientations: their commitment dimension (based on efficacy and value) mediated the effects of approach and Mav goals on some SR strategies (i.e. planning and self-monitoring) in some contexts; and their type or focus was moderated by the relevance and probability of normative success (i.e. in highly competitive contexts such as elite sport individuals tend to set normative goals).

This thesis, therefore, builds on existing trends of differentiation and integration and advocates: 1) a conceptualisation of achievement goals as a dynamic, cyclical interplay between situated reasons, standards, and SR actions; 2) an exploration of goal standard dimensions beyond the traditional mastery-performance focus within the reason-standard complex; and 3) an expanded achievement motivation and self-regulation model (see figure 6.1), including the ‘why’, the ‘what’ and the ‘how’ of achievement, where the focus of enquiry is shifted from achievement goals’ correlates, to the mechanisms of goal effects.

Practical Implications

Educators should be aware that one-size-fits-all SR interventions may not be effective for some students (i.e. those with high Pap/low Map and high avoidance/low approach motivation profiles), and that interventions should target both motivational beliefs (i.e. the meaning and causes of success, confidence in personal ability and the value of academic learning and sport/exercise participation) and SR skills. Traditionally, SR interventions in education and physical activity settings have focused on cognitive and meta-cognitive processes (the how) (e.g. imagery, self-talk) and less on self-motivation strategies (the why) and contextual influences (the where) (Kitsantas & Kavussanu, 2011; Zimmerman, 2011). These usually short-term interventions have not produced sustained results: ‘despite their initial success, these strategies were seldom maintained, transferred or used spontaneously when students

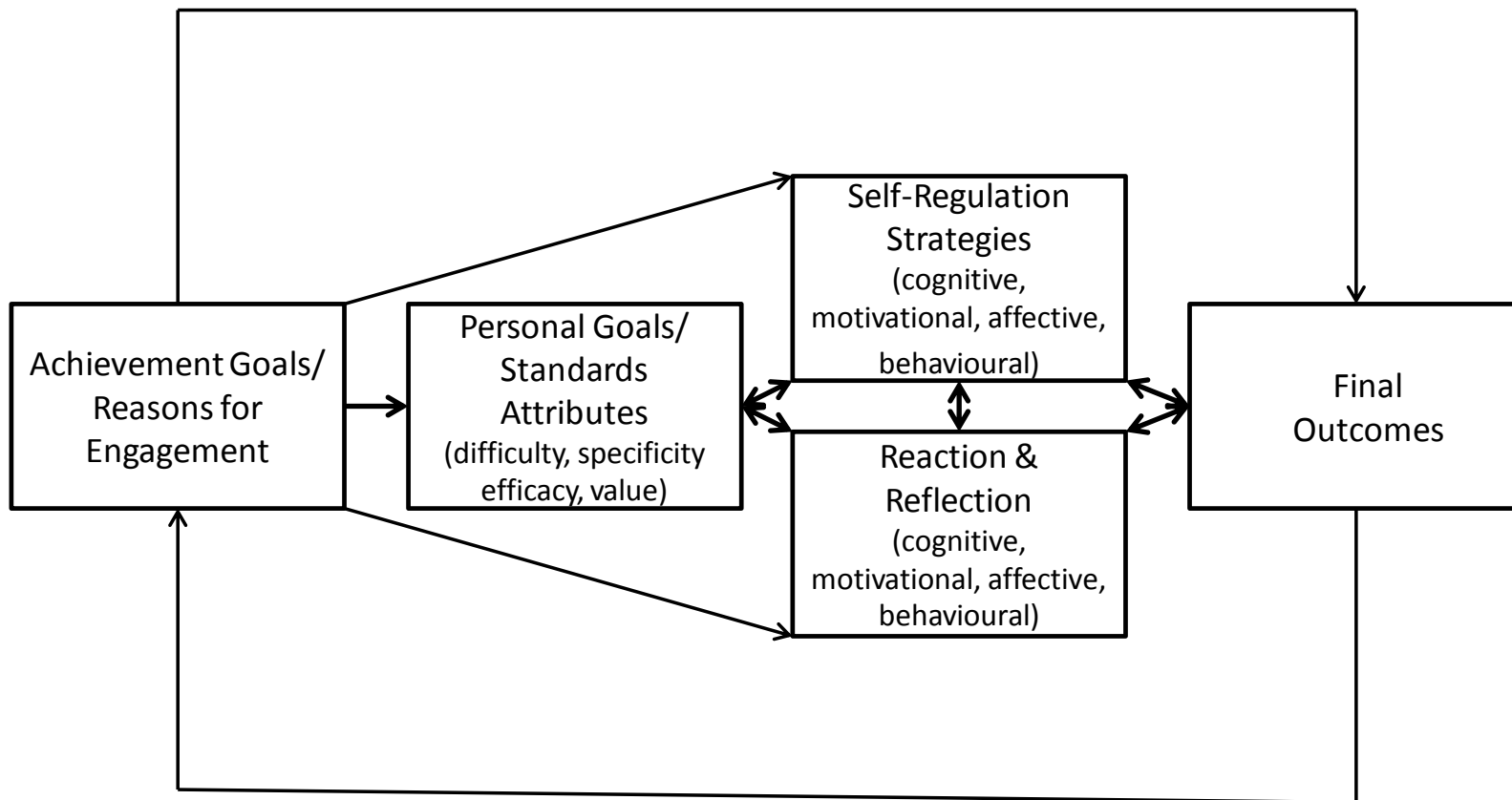


Figure 6.1. An integrated achievement goals and self-regulation model

studied or practiced in authentic contexts (Zimmerman, 2011, p. 49). Similarly, it was noted that athletes fail to use mental skills systematically (Vealey, 2007). Therefore, educators, coaches and exercise professionals should go beyond teaching a set of SR strategies; they should attend to students, athletes and exercisers' purposes of engagement, self-set standards, and the strategies that they perceive as relevant to their purposes. On the basis, practitioners could create motivational environments which support adaptive achievement goals for self-regulated action. An effective change to the motivational climate requires that practitioners make systematic attempts to build a bridge between their own and their students' reason-strategy orientations through an open dialogue about purposes of engagement, their consequences and adaptive SR strategies (Kaplan, 2008; Lichtinger & Kaplan, 2011).

Applied guidelines based on the achievement motivation and goal setting literatures (Roberts et al., 2007; Buron & Weiss, 2008) should take into account the strengths and weaknesses of different goal profiles in light of their propensities for self-regulated action. While creating mastery motivational climates and implementing classic goal setting processes may be an effective motivational approach for individuals with high mastery goal profiles (i.e. with low or high performance goals) it may not have the desired effect on individuals with a high performance and low mastery goal profile, or those high in avoidance motivation. For example, goal setting strategies may not 'work' for individuals with a strong performance purpose or reason of engagement (with low mastery goal) because: they may fail to accept the relevance of pursuing self/task-referred standards through planning and self-monitoring; will focus instead on monitoring and evaluation in relation to comparative-outcome standards (grades, ranking); and will engage in (ability-related) self-criticism following failure. Next, drawing on the findings of this thesis and existing literature, specific applied guidelines are offered for the high performance (low mastery) and the high mastery (low performance) profiles in sport and education settings.

The High Performance / Low Master Goal Profile: Guidelines

Goal Setting and Commitment

- Emphasise the relevance of mastery standards to the general Pap purpose by explaining the importance of short-term mastery standards to the achievement of long-term normative aims; and focus on task/process mastery goals before skill automaticity is attained, and on performance-outcome goals after (Zimmerman & Kitsantas, 1997, 1999)
- Develop commitment to mastery goals: encourage and support high Pap individuals to set their own mastery standards; ensure an optimal level of goal difficulty (for current ability level and task complexity) so that goals are perceived as attainable and desirable; an emphasis on goal utility value to the Pap purpose rather than intrinsic value may be more effective for enhancing commitment in this group.
- Use self-talk to develop self-efficacy (Hatzigeorgiadis, Zourbanos, Goltsios & Theodorakis, 2008) and interest-enhancing strategies to develop task value and enjoyment (Green-Demers et al., 1998; Sansone & Thorman, 2006).

Planning, Monitoring and Evaluation

- Stress the importance of planning and systematic implementation of optimal strategies, and the self-monitoring/evaluation of goal progress to the attainment of short-term mastery goals and long-term normative goals; monitoring through self-recording and graphing strategies are particularly beneficial to sport performance (Zimmerman & Kitsantas, 1997; Kitsantas & Zimmermn, 2006).
- Monitoring and evaluation through social comparison is highly valued by high Pap individuals and it does not need to be actively discouraged as recommended in the achievement goal literature; instead, the focus of comparison should be directed more towards performance processes than outcomes, for the explicit purpose of personal improvement through cooperation and friendly competition; work in heterogeneous ability groups can be beneficial for high Pap individuals if there are some high ability individuals in the group to allow for meaningful and strategic comparisons to multiple targets (both slightly better and worse off peers).

Self-Reflection and Self-Reaction

- Highlight the value of positive feedback in relation to mastery and normative standards to building a sense of personal control and confidence; having multiple mastery and normative standards should ensure successful experiences (i.e. positive feedback) in relation to some of these criteria.
- Highlight the importance of attributing setbacks (negative feedback on goal progress) to controllable causes such as effort and ineffective strategy; emphasise the usefulness of negative feedback on goal progress for taking corrective action such as adjusting goal difficulty, implementing more effective strategies and help seeking; encourage a view of ability as unknowable potential which can be actualised through optimal challenges, effort, persistence and support from others. Novices and non-expert athletes are particularly likely to making inappropriate attributions (Clearly & Zimmerman, 2001; Kitsantas & Zimmerman, 2002).
- Identify the most common circumstances when individuals experience low motivation and negative affect and their preferred strategies for controlling these states.
- Discuss the adaptive and maladaptive nature of these motivation and emotion regulation strategies, provide support to fine-tune existing effective strategies, and encourage the replacement of ineffective ones with optimal alternatives. There is evidence that motivation regulation strategies enhance motivation and engagement (Wolters, Benzon & Arroyo-Giner, 2011).

The High Mastery / Low Performance Goal Profile: Guidelines

Goal Setting

- Although these individuals set mastery standards these may be vague/easy, and related to information, skills and activities they find enjoyable and interesting.
- Emphasise the importance of setting multiple mastery standards that are specific and optimally challenging; and of aligning task and self-mastery standards to external normative criteria of evaluation for optimal performance in exams and athletic competitions.

- Encourage a view of peers as resources for learning, and peer comparisons as useful for maintaining objective perceptions of personal competence; create a view of abstract normative standards of success (e.g. grades) as indicators of task mastery and personal improvement.

Recommendations for Future Research

Considering the importance of goal attributes, planning, monitoring/evaluation, and control processes to goal attainment documented in the goal setting literature, future research should address the links between achievement purposes and SR strategies, with a special focus on:

- *Different perceived competence/efficacy standards* (task, self and others) (Elliot, 2005; Spray & Warburton, 2011); *different types of task value* (importance, utility, interest and cost) (Eccles, 2005); and *the interplay between perceived competence and value*. In this work, goal efficacy standards varied depending on the type of goal set by each student/athlete, and value was measured as importance rather than utility or cost. Therefore, the pattern of relations between achievement goals and personal goal efficacy and value may be characteristic to these operationalisations; future research should investigate whether other-related types of competence, and utility or cost types of value mediate Pap relations, while self and task types of competence and interest mediate Map relations with different SR strategies.
- *The role of self-set goal attributes such as content, specificity, difficulty, proximity, collectivity and commitment (the reason-standard complex)*. In study 1, academic goal content was classified into two categories of difficulty (difficulty vs. easy) based on objective criteria (grades above 60% were considered difficult). While academic goal difficulty did not moderate achievement goal relations to SR, future research should investigate the role played in these relations by subjective measures of goal difficulty (perceived difficulty) with greater range of variability levels (e.g. difficulty, moderate, easy). Moreover, in the sport domain, some participants in team sports set team rather than individual goals (despite being asked to provide a personal goal), therefore future

research should investigate the separate role of team and individual goals in the link between achievement goals and SR. The issue of team goals was also raised by Harwood, Spray and Keegan (2008) in relation to the conceptualisation of achievement goals. Finally, future research should investigate the best combination of achievement goals and personal goal types for SR in tasks with different levels of difficulty, complexity or automaticity.

- *Specific planning and self-monitoring strategies for individuals with different levels of perceived competence and competence valuation (at domain, task and personal goal levels), in contexts with different opportunities for success.* In this work, a composite measure of planning and self-monitoring was entered in SEM analyses therefore the separate links to achievement goals and other SR strategies (reward and criticism) could not be identified. Furthermore, planning was conceptualised in broad terms as stimulus control consisting of attempts to reduce internal and external interferences (i.e. other goals, or other people) to the selected goal, time management (i.e. scheduling of activities) and the more typical ‘planning steps necessary to reach this goal’. Future research should investigate specific measure of planning with reference to strategies designed to attain a goal in relation to different types of tasks, and separate measures of self-monitoring.
- *Specific types of social comparison (i.e. upward and downward) with perceived similar or dissimilar targets, under challenging and threatening environmental conditions.* For achievement goal theorists, social comparison implies gathering information on outcome or product measures of performance (rather than process) (e.g. one’s grades or sport performance relative to others), with negative effects on performance as less attention is available for task execution. In contrast, social comparison theorists view comparison with others as a general process of self-evaluation through others (Gibbons & Buunk, 1997, 2000), and a useful resource for gathering accurate information about the self, the task and how to improve (Butler, 1995; Collins, 1996; 2000). According to this related literature the effects of social comparison depend on the level of comparison target (upward vs. downward), purpose of comparison (self-improvement vs. self-enhancement), whether individuals see themselves as similar or dissimilar to the comparison target

(assimilation vs. contrast), and the personal importance of the domain (Wheeler & Suls, 2005). In this thesis, social comparison was conceptualised as composite of upward, downward and parallel comparisons (i.e. to better, worse or similar others). Therefore, future research should identify whether individuals with different achievement goals/profiles engage in upward or downward social comparison with perceived similar or dissimilar concrete targets; a recent study showed that individuals who view ability as malleable (a precursor of Map) focused on upward comparison after failure feedback (Nussbaum & Dweck, 2008). An integration of achievement goal and social comparison theories could lead to practical guidelines for the use of both self- *and* social-monitoring/evaluation in the service of Pap *and* Map goals during different stages of learning and levels of performance.

- *Motivation control* through a range of motivation strategies both extrinsic (e.g. performance self-talk, self-reward and self-criticism) and intrinsic in nature (e.g. mastery self-talk, interest and self-efficacy enhancement) in relation to different types of progress feedback attributions; and the nature and value of self-reward and self-criticism for Map and Pap purposes in challenging and threatening situations.
- *The role played in these effects by the motivational climate.* The motivational climate (i.e. perceptions of situational goals), an important moderator of achievement goal effects, has not been investigated in this thesis, and its inclusion in future research is strongly recommended. There is some evidence that mastery climate is conducive to some types of regulation (help seeking, metacognitive and effort regulation) and some of these effects are mediated by task orientation; while the effects of performance climate were mixed (i.e. null or positive and weak) (Theodosiou & Papaioannou, 2006; Ommundsen, 2006).

6.8. Conclusion

Individuals' reasons, standards and action strategies are integrated in the meaning they construe for engagement in an achievement domain. Achievement goals (the reasons for engagement) are associated with different patterns of self-regulated action: approach and

avoidance goals were linked to adaptive and maladaptive SR (Mav goals predicted self-criticism, and Pav goals were not linked to any of the strategies investigated); Map goals were associated with an adaptive pattern of SR (planning, self-monitoring, and self-reward), while the nature of SR strategies associated with Pap (social comparison and self-criticism) needs further investigation. The concrete standards or criteria of success selected by individuals in achievement settings, and their attributes (e.g. efficacy, value), are important components of goal-strategy orientations; the level of challenge and importance attached to these standards can enhance or reduce SR activity emanating from achievement goals. The goal-strategy patterns were stable over time and generalised to a large extent across physical activity and academic domains in different cultures. However, the objective level of competitiveness or the probability of normative success and failure appear to be a more meaningful contextual influence on performance goals patterns of SR than domain or culture per se. Indeed, in highly competitive contexts (where few succeed) such as elite and sub-elite sport, Pav not Pap goals were linked to SR through social comparison. Finally, achievement goal theory should engage in dialog with allied areas of research, such as goal setting and SR in order to become a comprehensive theory capable of addressing both goal selection and goal striving processes.

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APPENDIX 1. Achievement Goal Questionnaire (AGQ; Elliot & McGregor, 2001)
English and Romanian Versions

Mastery-approach goal

It is important for me to understand the content of this course as thoroughly as possible.
I want to learn as much as possible from this course.
I desire to completely master the material presented on this course.

Mastery-avoidance goal

I worry that I may not learn all that I possibly can on this course.
Sometimes I'm afraid that I may not understand the content of this course as thoroughly as I'd like.
I am often concerned that I may not learn all that there is to learn on this course.

Performance-approach goal

It is important to me to do better than other students.
It is important for me to do well compared to other students.
My goal on this course is to get a better grade than most of the other students.

Performance-avoidance goal

I just want to avoid doing poorly on this course.
My goal on this course is to avoid performing poorly.
My fear of performing poorly on this course is often what motivates me.

Romanian Translation

Mastery-approach goal

Este important pentru mine să înțeleg cit mai bine conținutul materiilor studiate.
Imi doresc să învăț cât mai mult posibil la facultate.
Doresc să stăpânesc complet materiile studiate la facultate.

Mastery-avoidance goal

Mă îngrijorează că s-ar putea să nu învăț la facultate tot ceea ce sunt eu capabil.
Uneori mă tem că s-ar putea să nu înțeleg conținutul materiilor atât de bine pe cât aș dori.
Adesea mă îngrijorează că s-ar putea să nu învăț la facultate tot ce este de învățat.

Performance-approach goal

Este important pentru mine să învăț mai bine decât alți studenți.
Este important pentru mine să am rezultate bune în comparație cu alți studenți.
Scopul meu la facultate este să am o medie mai bună decât majoritatea studenților.

Performance-avoidance goal

Vreau doar să evit rezultate slabe la facultate.
Obiectivul meu la facultate este să evit performanțele slabe.
Adesea ceea ce mă motivează pe mine la facultate este teama de rezultate slabe.

APPENDIX 2. Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995)

Goal Value

This goal is valuable to me.

This goal is worthwhile.

This goal is important to me.

This goal is meaningful to me.

Goal Efficacy

I possess the necessary skills to attain this goal.

I have the necessary knowledge to reach this goal.

I have what it takes to reach this goal.

I have the ability to reach this goal.

Planning

I try not to let other goals interfere with this goal.

I try to plan out in advance the steps necessary to reach this goal.

I try not to let other people interfere with my work on this goal.

I carefully schedule my activities so I have enough time to pursue this goal.

Self-Monitoring

I'm aware of my day-to-day behaviour as I work toward this goal.

I keep track of my overall progress toward this goal.

I tend to notice my successes while working toward this goal.

I am on the lookout for potential obstacles that might interfere with my progress on this goal.

Social Comparison

I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing worse than I am.

I evaluate my progress on this goal by comparing myself to people who are also working on it, but are doing better than I am.

I evaluate my progress toward this goal in comparison to how well other people are doing in pursuing it.

I evaluate my progress on this goal by comparing myself to people who are very much like me in terms of background and ability.

Self-Reward

I reward myself for working hard on this goal.

I reward myself when I make progress toward this goal.

I treat myself to something special when I make progress toward this goal.

I congratulate myself when things are going well on this goal.

Self-Criticism

I routinely criticize myself for unsatisfactory work on this goal.

When working on this goal, I criticize myself for not always having what it takes to succeed.

I tend to criticize myself when I'm not making progress toward this goal.

I routinely criticize myself if I don't work hard enough on this goal.

APPENDIX 3. Achievement Goal Questionnaire for Sport (AGQ-S; Conroy, Elliot, & Hoffer, 2003) English and Romanian Versions

Mastery-approach goal

It is important to me to do as well as I possibly can.
It is important for me to master all aspects of my performance.
I want to perform as well as it is possible for me to perform.

Mastery-avoidance goal

Sometimes I'm afraid that I may not perform as well as I'd like.
I'm often concerned that I may not perform as well as I could.
I worry that I may not perform as well as I possibly can.

Performance-approach goal

It is important for me to perform better than others.
It is important to me to do well compared to others.
My goal is to do better than most other performers.

Performance-avoidance goal

I just want to avoid doing worse than others.
My goal is to avoid performing worse than everyone else.
It is important for me to avoid being one of the worst performers in the group.

Romanian Translation

Mastery-approach goal

Este important pentru mine sa evoluez cit pot eu de bine.
Este important pentru mine sa stapanesc toate aspectele performantei mele.
Imi doresc sa evoluez cit pot eu de bine.

Mastery-avoidance goal

Uneori, ma tem ca s-ar putea sa nu evoluez la nivelul pe care-l doresc
Adesea, ma ingrijorez ca s-ar putea sa nu evoluez la nivelul meu cel mai bun.
Ma ingrijorez ca s-ar putea sa nu evoluez pe cit pot eu de bine.

Performance-approach goal

Este important pentru mine sa am performante mai bine decat altii.
Este important pentru mine sa evoluez bine in comparatie cu altii.
Scopul meu este sa evoluez mai bine decat majoritatea concurentilor.

Performance-avoidance goal

Vreau doar sa evit performantele mai slabe decat ale altora.
Scopul meu este sa evit performantele mai slabe decat ale altora.
Este important pentru mine sa evit sa fiu unul dintre cei mai slabi din grup.

APPENDIX 4. The Self-Construal Scale-Revised (SCS-R; Hardin, 2006)
English and Romanian Versions

Individualism

My personal identity, independent of others, is very important to me.
I feel it is important for me to act as an independent person.
I enjoy being unique and different from others in many respects.
I do my own thing, regardless of what others think.

Collectivism

It is important for me to maintain harmony within my group.
It is important to me to respect decisions made by the group.
I feel good when I cooperate with others.
I have respect for the authority figures with whom I interact.

Romanian Translation

Individualism

Identitatea mea personala independenta de altii, este foarte importanta pentru mine.
Este important pentru mine sa actionez ca o persoana independenta in raport cu altii.
Imi place sa fiu unic/a de altii in multe privinte.
Fac cum vreau eu, indiferent ce gindesc altii.

Collectivism

Este important pentru mine sa mentin armonia in grupul meu.
Este important pentru mine sa respect deciziile grupului meu.
Ma simt bine cind cooperez cu altii.
Respect persoanele cu autoritate din viata mea.

APPENDIX 5. Goal Systems Assessment Battery (GSAB; Karoly & Ruehlman, 1995)
Romanian version

Value

Acest obiectiv este valoros pentru mine.
Acest obiectiv merită a fi îndeplinesc.
Acest obiectiv este important pentru mine.
Acest obiectiv este semnificativ pentru mine.

Self-Efficacy

Posed deprinderile necesare îndeplinirii acestui obiectiv.
Dețin cunoștințele necesare atingerii acestui obiectiv.
Am calitățile necesare pentru atingerea acestui obiectiv.
Am capacitatea de a atinge acest obiectiv.

Planning

Încerc să nu permit altor obiective să-mi împiedice realizarea acestui obiectiv.
Încerc să-mi planific dinainte pașii necesari pentru atingerea acestui obiectiv.
Încerc să nu las alte persoane să-mi împiedice munca pentru acest obiectiv.
Îmi planific cu grijă activitățile ca să am destul timp pentru urmărirea acestui obiectiv.

Self-Monitoring

Sint conștient(a) de comportamentului meu de zi-cu-zi, în timp ce muncesc pentru acest obiectiv.
Mentin sub observație / monitorizez progresul făcut spre acest obiectiv.
Am tendința să-mi observ succesele realizate în timp ce muncesc pentru acest obiectiv.
Încerc să identific obstacolele care ar putea să-mi împiedice progresul către acest obiectiv.

Social Comparison

Îmi evaluez progresul spre acest obiectiv prin comparație cu alte persoane care au același obiectiv dar care se descurcă mai rău decât mine în îndeplinirea lui.
Îmi evaluez progresul spre acest obiectiv prin comparație cu alte persoane care au același obiectiv, dar care se descurcă mai bine decât mine în îndeplinirea lui.
Îmi evaluez progresul spre acest obiectiv prin comparație cu progresul altora spre același obiectiv.
Îmi evaluez progresul spre acest obiectiv prin comparație cu alte persoane cu posibilități asemănătoare cu ale mele.

Self-Reward

Mă reasplătesc când muncesc din greu pentru atingerea acestui obiectiv.
Mă rasplătesc când fac progrese spre îndeplinirea acestui obiectiv.
Mă rasplătesc cu ceva deosebit când fac progrese către acest obiectiv.
Mă felicit atunci când lucrurile îmi merg bine spre realizarea acestui obiectiv.

APPENDIX 5. Goal Systems Assessment Battery – Romanian Translation (continued)

Self-Criticism

De obicei ma critic cind nu sint satisfacut(a) cu munca depusa pentru atingerea acestui obiectiv.

Când muncesc pentru atingerea acestui obiectiv mă critic pentru că nu am intotdeauna calitatile necesare îndeplinirii lui.

Am tendinta să mă critic când nu fac progrese spre acest obiectiv.

De obicei ma critic dacă nu muncesc suficient pentru atingerea acestui obiectiv.